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Dear MICCAI 2018 participant,

On behalf of the MICCAI Society Board, I wish you a very warm welcome to MICCAI 2018, in the beautiful city of Granada, with its rich history, culture and splendid monuments.

This is already the 21st MICCAI. In many cultures (and in MICCAI we are proud to welcome people from so many different countries and origins), turning 21 is something special; the age in which you turn from a girl into a woman, or from a boy into a man. The significance of the 21st birthday already dates back to medieval times, as it was the age at which, completing years of successful training, candidates that were worthy would be bestowed knighthood.

But to most, it is the age in which you become more independent, experiencing more freedom, but also, becoming aware of your increasing responsibilities. Interestingly, for the MICCAI Society, both these issues are very relevant and timely. As a MICCAI Society we are committed to provide an atmosphere that encourages the free expression and exchange of ideas, and make sure that all participants enjoy a welcoming and safe environment; these issues are therefore central in the MICCAI 2018 code of conduct. Also, as a MICCAI Society we are aware of our responsibilities to society. Our scientific advances and technological innovations have large potential to improve biomedical research and clinical practice. To increase our impact, the MICCAI Society aims to expand its collaborations with other professional organizations. Recently, we signed a MoU with the American College of Radiology to collaborate to ensure that AI algorithms meet the clinical needs in radiology. We are very proud and grateful that the Chair of the ACR, Geraldine McGinty, delivers a keynote speech at this year’s MICCAI conference.

Of course, MICCAI 2018 would not have been possible without the hard work of many individuals, who, mostly fully voluntarily, devote many hours to its success. I would like to thank all that have contributed for their great efforts: the authors who bring the excellent scientific content, the reviewers for their hard work which enables the organizers to shape the programme and provide authors feedback, and the many members of the MICCAI Society who in the background support the local organization. Lastly and most importantly, I would like to take this opportunity to thank and compliment the MICCAI 2018 organization committee for what is shaping up to be a very successful and memorable MICCAI conference. Organizing a MICCAI conference is a rewarding, but also intense, experience, and we owe it to you that we can enjoy a full week of experiencing great science and innovation in a great environment.

On behalf of the MICCAI Society Board,

Wiro Niessen
MICCAI Society President
Dear Delegate,

So… here we are. ¡Bienvenidos! The journey we started back in September 2014, when we presented our bid for Granada 2018, has now reached its final stage. It has been four years of planning, teamwork, and hard work by a stellar team! A long journey… sometimes straight, sometimes tortuous, but what matters now is the outcome you will soon be able to judge.

This year’s MICCAI is the first to be celebrated in a Spanish-speaking country, and we chose a remarkable and memorable place to celebrate this unique event. Different options were considered to achieve a balance between hosting capacity, affordable prices, ease of access, and cultural relevance, just to mention a few criteria. Granada proved to be an outstanding choice. Granada is a mid-sized city, with slightly over two hundred thousand inhabitants and considered a “university city”, where annually fifty thousand students are hosted in Granada’s “alma mater”. Therefore, the atmosphere in this city is young, dynamic, forward looking, and with a matching great weather. However, importantly, Granada is a cornerstone in Spanish history, as for centuries it has been home to the peaceful coexistence of cultural diversity as a melting pot of Islamic, Jewish and Christian cultures. Granada also was the cradle and starting point of modern America’s history, from when Christopher Columbus was commissioned here to explore and discover the “New World” through an agreement signed with the Catholic Monarchs in Santa Fe, a small town nearby Granada.

As for the conference itself, all our wildest expectations have been surpassed and we hope this also will be your experience at its culmination. At the time of writing, our registration numbers are record-breaking. For the main conference, nearly 1,400 delegates registered, and over 1,600 attendees are expected over the two days of Satellite Events. We thank the community for this overwhelming response.

The crux of a great conference is a great scientific program, which requires an innovative and creative community backing the event; and you surely have contributed in 2018! We received over one thousand submissions, i.e. an increase of 33% over last year and the largest number to date. The number of accepted papers also has increased by this percentage. To keep the same acceptance rate for oral presentations, we made a major decision for this Conference on whether to move to parallel tracks, or to keep the single-track identity that MICCAI has held since its onset in 1998. In consultation with the MICCAI Board, we finally made a pilot experiment keeping a single-track program for two days (Monday and Wednesday), but exploring a full day with a parallel-track program on the Tuesday.

We feel honoured to have secured four highly reputed Keynote Speakers, who represent a wide range of expertise relevant to MICCAI. Our keynote speakers are female and male role models for our community ranging from technology to clinical translation, from academia to industry and healthcare organisations,
and from AI to advanced robotics and intelligent systems. These are Professor Kristen Grauman, from Facebook AI Research & Professor in the Department of 
Computer Science at the University of Texas at Austin; Geraldine McGinty MD, 
MBA, FACR who is Chair of the ACR’s Board of Chancellors, and Chief Strategy 
and Contracting Officer, Weill Cornell Medicine Physician Organization; 
Professor Bradley Nelson, a Professor in Robotics and Intelligent Systems at 
ETH Zürich; and Professor Paolo Dario, Director of the BioRobotics Institute at 
Scuola Superiore Sant’Anna, Pisa, Italy.

Satellite Events are becoming a substantial part of the MICCAI program and 
have attracted an increased interest in MICCAI 2018. We have accommodated a 
large number of highly valued Workshops, Tutorial and Challenges (40, 14 and 
12, respectively), which express the wide variety of interests, born directly from 
our community. We made efforts to allocate more space to these events, as the 
response of the community with high-quality proposals to the respective calls was 
overwhelming. We are particularly excited this year by the growing the number 
of Tutorials, as they represent an important educational component of MICCAI.

We want MICCAI develop as an ever friendlier and supportive community. 
Hence, a new contribution of MICCAI 2018 is the Mentoring Program. Mentors 
and mentees can interact during the conference in our specially purposed 
Ambassador Room, and we are sure that both parties will benefit from the 
exchange. We look forward to suggestions on how to improve this scheme in 
future years. This is a two-way exchange: mentors will transmit expertise and 
experience, and our mentees, enthusiasm and drive to excel. This program has 
been oversubscribed this year, proving its timeliness and need for more mentors. 
If you have not enrolled as a mentor, please talk to other mentors about their 
experience and consider your involvement.

One area we are most proud of is the impressive and well-rounded program of 
activities organised by our MICCAI Student Board. Our students bring vibrancy 
and fresheness to our program, not only covering areas crucial to their development 
(e.g. the longstanding Academia-Industry Event and the MICCAI Educational 
Challenge), but also to our work-life balance with a very rich program of Social 
and Sport Activities, including a shiny new MICCAI Talent Show. Thank you so 
much for your initiative and your help to make MICCAI 2018 a great success.

Equality and diversity are key values of our Society, and we are proud to say that 
all delegates to the MICCAI 2018 Conference and Satellite Events have signed 
up for our Code of Conduct . We all now have a joint responsibility to respect this 
code and to support any misconduct we may experience or witness. To facilitate 
this, for the first time, an Ombudsperson (Prof. Alison Noble, University of 
Oxford), and a Deputy-Ombudsperson (Prof. Terry Peters, Western University) 
have been appointed, who can be approached for advice, with suggestions, or to 
report any misconduct.
The Women in MICCAI Committee has organised the traditional WiM Lunch offering a round table and space for debate to raise awareness of the value brought by each member of our Society, and discuss solutions to tackle imbalances in our community. We would not have a Code of Conduct in 2018 if it were not for the strong commitment of various members of WiM and our Organising Committee. WiM demonstrates with seemingly simple initiatives, but unwavering steps we can transform our community into a place in which we can all be proud. Please, attend this lunch and have your say!

We have three partner events implemented as Joint Workshops. The first one being the “VCBM-MICCAI Workshop on Medical Augmented Reality and Visualization-oriented Systems for Intervention Planning”. The Visual Computing in Biology and Medicine Workshop (VCBM, vcbm.org) is a workshop series started in 2008 in Delft and sponsored by the EUROGRAPHICS Society. Some MICCAI papers within the scope of this Workshop have been selected and invited for oral presentation at this workshop. The second event is the “SIPAIM-MICCAI Biomedical Workshop Biomedical Information Processing and Analysis: A Latin American perspective”. SIPAIM is a yearly event held in Latin America, whose main goal is to bring together medical and biomedical researchers from the region, who have a strong interest in image and signal analysis. This workshop paves the way for the MICCAI edition to be held in Peru in 2020, and is a great example of geographic sub-communities that work with MICCAI to develop our common interests. Finally, one of our longstanding workshops this year has attracted the endorsement of ISMRM, the International Society for Magnetic Resonance in Medicine; effectively jointly sponsoring the MICCAI-ISMRRM Workshop on Computational Diffusion MRI. All these co-sponsored events involve cross-recognition of membership fees and provide wider incentives for participation in events at the interface between communities. This would not have been achieved without many individuals with a foot in both camps. To them all, thanks!

As of this year, we have selected CrowdCompass® (www.crowdcompass.com) as the official conference app. This is the same app that was successfully used at CVPR this year. This app may serve for some other future conferences. The same app will gifted to, and be used by the MICCAI Society as their Society App. Attendees now have at their disposal an integrated environment in which all the information for these conferences will be accessible with just a click. In addition, your personal profiles will be kept in the system throughout this period, and so only need to be updated once. There is an option to make your profile visible to selected sponsors and companies, and to receive possible career opportunities and to develop your network of contacts.
Together with the Scientific Program, there are several organized social activities. The Alhambra Tour is the main event in our social activities’ menu. We hope to welcome you all at the MICCAI Reception on Sunday evening and at the Gala Dinner at “La Mamunia” on Monday evening. We hope you can explore the town on Tuesday and Wednesday evenings or join one of the Alhambra Tours. There is a plethora of other popular activities awaiting you, organised either by the main conference or by the MICCAI Student Board.

We were impressed this year by the number and diversity of our Corporate and Public Sponsors, which have raised record funds to make this event memorable and cost-efficient. We thank our Platinum Sponsors, Siemens Healthineers and NVIDIA; our Gold Sponsors: IBM, CVTE, and Subtle Medical; our Silver Sponsors: Medtronic, Arteryx, ImFusion, ClaroNav, ImSight, and Huiyi Hui Ying; our Bronze and Start-up Sponsors: Zeiss, Deepwise and Cosmopla; our Partner Publishers, Springer and Elsevier; and the contributors who funded our 50 Travel Bursaries: MICCAI Society, MICCAI 2018 Organisation, National Institutes of Health -NIH (USA), and MedIAN Network funded by the Engineering and Physical Sciences Research Council -EPSRC (UK). This conference would not be the same without your support!

This event has been possible thanks to the effort and enthusiasm of many colleagues, to whom we express our sincerest and deepest gratitude. We have spent many hours reading and writing emails, attending online teleconferences and, to cut a long story short, trying to make this event a great success by involving the community as much as possible. We are therefore indebted to our colleagues in the MICCAI2018 Executive Committee, whom we met almost biweekly and wrote emails daily, to the wider Organizing Committee who got down to the nitty gritty details of innumerable actions, to the Program Committee who worked hard to select reviewers and papers to deliver a great scientific program. We also are indebted to the DEKON Group, our official Professional Conference Organisation partner. Thanks, finally, to the MICCAI Society Board and its President for the trust placed on us, to the MICCAI Student Board for their great professionalism and enthusiasm, the Women in MICCAI Committee for their efforts to make our society all-inclusive, and to the MICCAI Secretariat Staff for their never failing willingness to help, and for the accuracy of their solutions.

We can proudly say that thanks to the daily support of all these people, MICCAI 2018 will hopefully satisfy and exceed all your expectations.

Now... time to get started. May the plans and expectations we dreamed of in 2014 now become reality, and may you enjoy and benefit from the conference as much as we hope.

Prof. Alejandro F. Frangi  
MICCAI 2018 General Chair  
University of Leeds, UK

Prof. Carlos Alberola-Lopez  
MICCAI 2018 General Co-Chair  
Universidad de Valladolid, Spain
Executive Officers
President and Board Chair: Wiro Niessen
Executive Director (Managing Educational Affairs): Li Shen
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Honorary Elections Officer: Max Viergever

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Recording Secretary and Web Maintenance: Jackie Williams, Canada
Fellows Nomination Coordinator: Terry Peters, Canada

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Guoyan Zheng Institute for Surgical Technology & Biomechanics, Bern, Switzerland
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Antonio R. Porras  Associate to General Chair
Julia A. Schnabel  Program Chair
Christos Davatzikos  Program Co-Chair
Gabor Fichtinger  Program Co-Chair
Alejandro Frangi  Program Co-Chair
Spyridon Bakas  Associate to Program Chairs
Alberto Gomez  Associate to Program Chairs
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Miguel Gonzalez-Ballester  Tutorial & Educational Co-Chair
Marius Linguraru  Tutorial & Educational Co-Chair
Kensaku Mori  Tutorial & Educational Co-Chair
Carl-Fredrik Westin  Tutorial & Educational Co-Chair
Danail Stoyanov  Workshop & Challenge Chair
Hervé Delingette  Workshop & Challenge Co-Chair
Lena Maier-Hein  Workshop & Challenge Co-Chair
Zeike Taylor  Workshop & Challenge Co-Chair
Josien Pluim  Keynote Lecture Chair
Matthias Harders  Keynote Lecture Co-Chair
Tim Salcudean  Keynote Lecture Co-Chair
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Hayit Greenspan  Corporate Affairs Co-Chair
Despina Kontos  Corporate Affairs Co-Chair
Guy Shechter  Corporate Affairs Co-Chair
Demian Wesserman  Student Activities Facilitator
Karim Lekadir  Student Activities Co-Facilitator
Pedro Lopes  Communications Officer
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Ali Gooya</td>
<td>University of Sheffield</td>
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<tr>
<td>Amber Simpson</td>
<td>Memorial Sloan Kettering Cancer Center</td>
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<td>Andrew King</td>
<td>King's College London</td>
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<td>Bennett Landman</td>
<td>Vanderbilt University</td>
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<td>Bernhard Kainz</td>
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<td>Burak Acar</td>
<td>Bogazici University</td>
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<td>Carola Schoenlieb</td>
<td>Cambridge University</td>
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<td>Caroline Essert</td>
<td>University of Strasbourg / ICUBE</td>
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<td>Christian Wachinger</td>
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<td>Christos Bergeles</td>
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<td>Daphne Yu</td>
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<td>Duygu Tosun</td>
<td>University of California, San Francisco</td>
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<td>Emanuele Trucco</td>
<td>University of Dundee</td>
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<td>Ender Konukoglu</td>
<td>ETH Zurich</td>
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<td>Enzo Ferrante</td>
<td>CONICET / Universidad Nacional del Litoral</td>
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<td>Erik Meiijering</td>
<td>Erasmus University Medical Center</td>
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<td>Gozde Unal</td>
<td>Istanbul Technical University</td>
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<td>Guido Gerig</td>
<td>New York University</td>
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<td>Gustavo Carneiro</td>
<td>University of Adelaide</td>
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<td>Hassan Rivaz</td>
<td>Concordia University</td>
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<td>Herve Lombaert</td>
<td>ETS Montreal</td>
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<td>Hongliang Ren</td>
<td>National University of Singapore</td>
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<td>Ingerid Reinertsen</td>
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<td>Ipek Oguz</td>
<td>University of Pennsylvania / Vanderbilt University</td>
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<td>Ivana Isgum</td>
<td>University Medical Center</td>
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<td>Juan Eugenio</td>
<td>Iglesias University College London</td>
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<td>Kayhan Batmanghelich</td>
<td>University of Pittsburgh / Carnegie Mellon University</td>
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<td>Laura Igual</td>
<td>Universitat de Barcelona</td>
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<td>Lauren O’Donnell</td>
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<td>Le Lu</td>
<td>Ping An Technology US Research Labs</td>
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<td>Li Cheng</td>
<td>A*STAR, Singapore</td>
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<td>Lilla Zollei</td>
<td>Massachusetts General Hospital</td>
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<td>Linwei Wang</td>
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<td>Marc Niethammer</td>
<td>University of North Carolina at Chapel Hill</td>
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<td>Marius Staring</td>
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<td>Marleen de Bruijne</td>
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<td>Marta Kersten</td>
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<td>Mattias Heinrich</td>
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<td>Miaomiao Zhang</td>
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<td>Moti Freiman</td>
<td>Philips Healthcare</td>
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<td>Nasir Rajpoot</td>
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<td>Pingkun Yan</td>
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<td>Purang Abolmaesumi</td>
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<td>Ragini Verma</td>
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<td>Raphael Sznitman</td>
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<td>Sandrine Voros</td>
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<td>Stefanie Speidel</td>
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<td>Vamsi Ithapu</td>
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<td>Yanwu Xu</td>
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## PROGRAM OVERVIEW

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Registration Desk
Registration desk will be located at the entrance foyer of Granada Convention Center (PCGR). The working hours of the registration desk will be as below;

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
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<tbody>
<tr>
<td>16 September 2018, Sunday</td>
<td>07:30-21:30</td>
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<tr>
<td>17 September 2018, Monday</td>
<td>08:00-19:00</td>
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<tr>
<td>18 September 2018, Tuesday</td>
<td>08:00-19:00</td>
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<tr>
<td>19 September 2018, Wednesday</td>
<td>08:00-18:30</td>
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<tr>
<td>20 September 2018, Thursday</td>
<td>08:00-18:00</td>
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Exhibition-Opening Hours
Granada Convention Center Foyer Floor 1 will be used as exhibition area.

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
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<tbody>
<tr>
<td>17 September 2018, Monday</td>
<td>08:00-19:00</td>
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<tr>
<td>18 September 2018, Tuesday</td>
<td>08:00-19:00</td>
</tr>
<tr>
<td>19 September 2018, Wednesday</td>
<td>08:00-17:30</td>
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</table>

Lunches and Coffee Breaks
Lunches and coffee breaks are included in the registration and will be served at Level 1 Foyer where the exhibition area and the poster area is located. Coffee Break and Lunch Break times are as following;

**16 September 2018, Sunday**
- 11:00-11:30 1st Coffee Break
- 13:30-15:00 Lunch Break
- 16:30-17:30 2nd Coffee Break

**17 September 2018, Monday**
- 11:00-11:30 1st Coffee Break
- 13:30-15:00 Lunch Break
- 16:15-16:45 2nd Coffee Break

**18 September 2018, Tuesday**
- 11:00-11:30 1st Coffee Break
- 13:30-15:00 Lunch Break
- 16:30-17:30 2nd Coffee Break

**19 September 2018, Wednesday**
- 11:00-11:30 1st Coffee Break
- 13:30-15:00 Lunch Break
- 17:00-17:30 2nd Coffee Break

**20 September 2018, Thursday**
- 11:00-11:30 1st Coffee Break
- 13:30-15:00 Lunch Break
- 16:30-17:30 2nd Coffee Break
GENERAL INFORMATION

Name Badges
Please wear your name badges at all times. Only MICCAI 2018 participants wearing official name badges will be allowed to access the conference site and attend the scientific and social programs.

Internet Access
Wifi access is available through the conference halls. The Wifi credentials are as below;
Wireless Name : MICCAI2018
Password : 20miccai18

Poster Presentations
Foyer Level 1 will be used as poster area.

All accepted papers are to be presented as posters at the conference. The posters will stay up throughout the three days of the main conference. During the assigned poster sessions, one of the authors must present the paper at the poster. The posters may be mounted starting at 08:00 on Monday, 17th September 2018. The posters must be taken down on Wednesday, 19th September 2018 between 16:30-18:00. Posters left behind by presenters will be discarded.

Poster Identifiers
Each poster is assigned to a unique identifier. The letter indicates the day of the poster presentation and the number indicates the order of the poster.

The poster schedule and poster labelling is as below;

17 September 2018, Monday

<table>
<thead>
<tr>
<th>Session/Time</th>
<th>Poster Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster Session 1 (11:30-13:00)</td>
<td>M 1-M 79</td>
</tr>
<tr>
<td>Poster Session 2 (18:00-19:30)</td>
<td>M 80-M 152</td>
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</tbody>
</table>

18 September 2018, Tuesday

<table>
<thead>
<tr>
<th>Session/Time</th>
<th>Poster Labels</th>
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<tbody>
<tr>
<td>Poster Session 3 (11:30-12:30)</td>
<td>T 1-T 70</td>
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<tr>
<td>Poster Session 4 (18:00-19:30)</td>
<td>T 71-T 152</td>
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</table>

19 September 2018, Wednesday

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<thead>
<tr>
<th>Session/Time</th>
<th>Poster Labels</th>
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<tbody>
<tr>
<td>Poster Session 5 (11:30-12:30)</td>
<td>W 1-W 69</td>
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</table>

Please find your poster number from the detailed poster session program
Long Oral and Spotlight Presentations
Each regular oral presentation is allocated a 15 minute slot:
- Regular talks must not exceed 12 minutes, leaving 2-3 minutes for questions.
- Each spotlight (short) talk is allocated a 5 minute slot, without any question time.

Timing will be strictly enforced to ensure a smooth handover between speakers. Please ensure that you have rehearsed the timing of your talk beforehand. As a rule of thumb, you should have one slide per minute of talk time. The session chair will introduce each speaker and title of the talk. Each oral presentation will also have an associated poster presentation, and therefore any additional details can be provided at that time.

Satellite Events
The Satellite events will be hosted at Granada Convention Center and Saray Hotel. Saray Hotel is in 2 minutes walking distance to Granada Convention Center. Please refer to the satellite events section at the program book to find which satellite events will be organized at Saray Hotel. For the satellite events that is hosted at Saray Hotel the coffee break service will be provided at the hotel. Poster sessions and lunch breaks for these events will be hosted at Granada Convention Center Level 1 Foyer.

About Granada
The city of Granada, one of the most beautiful in the world, located in the south of Spain, between the highest mountain range in the Iberian peninsula (the location of the most southerly Ski and Mountain resort in Europe: Sierra Nevada) and the tropical and Mediterranean coast. Full of history, Granada has been a point of encounters, meetings and crossings of the most diverse cultures since the early ages, having reached its greatest splendour during the successive Arab reigns, which lasted for eight centuries.

Despite this pre-eminent past, Granada has become a modern, equipped and dynamic city, in which its university, the third biggest in Spain, has an important role, providing the city with a young, cultural and cosmopolitan atmosphere.

Next to the capital, and forming part of the region of Granada, is a chain of towns united by their history and the city of the Alhambra. Towns that share their wealth of heritage and variety of landscapes, towns that make it possible to get together and enjoy being close to the snow, the waters of the Mediterranean, the towns of the Alpujjarra and the Gorafe desert.

Currency & ATMs
The Euro is the official currency of Spain. Bank notes come in denominations of 5, 10, 20, 50, 100, 200, 500 Euro Coins are denominated in 2 and 1 Euro, then 50, 20, 10, 5, 2 and 1 cents.

Having access to cash in Spain is easy. The ATM network is one of the biggest in Europe. If you need to exchange money you can do it at the Corte Inglés (opens Monday to Saturday from 10:00 to 22:00) and at most hotels. You will also need your passport in order to exchange money at the BBVA bank.
LEVEL -2
LEVEL -1

EL PARTAL
SALON 10

NAZARI
SALON 9

ABENCERRAJES
SALON 4

SALA de los REYES
SALON 3

SALA de la BARCA
SALON 2

MOCARABES
SALON 6

ALCAZABA
SALON 1
SPECIAL AND SOCIAL EVENTS

ACADEMIA & INDUSTRY EVENT

**Sunday 16th Sept 2018, 7.00 PM-8.30 PM | room Andalucía-Theater, GRANADA EXHIBITION AND CONFERENCE CENTRE**

The Academia & Industry event aims to allow students to answer their most pressing questions and to interact directly with professionals from academia and industry. We will first have a panel with top academics and industry representatives. Next, we will have a networking session where students can talk one-on-one with the panelists and additional professors and company representatives, including the companies sponsoring MICCAI. This is a great opportunity to learn more about different career paths and create connections! Light snacks and drinks will be provided.

MICCAI RUNNING

**Monday, Tuesday and Wednesday 17th-19th Sept, 7.00 AM-8.00 AM**

Join us for morning runs and start a long conference day full of energy!

We meet at the lobby of the convention center at 7:00 AM to join the runs on Monday, Tuesday, and Wednesday. Similar to previous years in Québec, Athens, Munich and Boston, the total length of each run will be between 5 and 8 kilometers and we’ll take the pace of the slowest runner, so do come along regardless of your pace! Participants must be in good physical health and be fit to participate.

FLAMENCO DANCING LESSONS

**Wednesday 19th Sept 2018, 7.00 PM-8.00 PM**

ContraDanza Dance Studio, Gran Vía de Colón 36, Granada City Centre – Close to the Cathedral

Wednesday, September 19th, 2018 is Flamenco time! Experience the tradition of Andalucia first hand and enjoy an evening full of dancing! No previous experience required! Skillful, local instructors will be conducting the lesson in English. Meet us in the lobby of the convention center on Wednesday, 19th of September at 6:30 pm. We will then walk together to the dancing hall or you can meet us at 7:00 pm at the dance studio directly. There are no specific footwear guidelines, but please bear in mind that there is a need to slide your feet and dance basic steps.
SPECIAL AND SOCIAL EVENTS

SOCcer

Wednesday 19th Sept 2018, 08.00 PM–10.00 PM
Chana, Campo De Futbol

If dancing is not for you don’t worry! Join us on the evening of Wednesday, September 19th, 2018 for a soccer match! Unveil your football talent in the famous Spanish soccer fields! Meet us at the conference center on Wednesday, September 19th, at 7.00 PM in your sports gear and we will walk to the soccer field together. Participation is free of charge. Registration through the MICCAI 2018 registration system or via sending an email to registration@miccai2018.com

CITY TOUR & HISTORIC WALK

Tuesday 18th Sept 2018, 8.00 PM–09.30 PM
Plaza Nueva, Chancillería de Granada

Join us for a leisurely walking tour of Granada with a licensed local guide in English. Learn about the architecture, culture, and history of the Andalusian city. Highlights include Albaicin, the Royal Chapel and the Granada Cathedral.

The tour will start from the Courthouse building at 8:00 PM, so please be on time!

GUIDED HIKING TOUR SIERRA NEVADA

Friday 21st Sept 2018, 09.30 AM–5.30 PM

After a fun conference week it’s time to go on an adventure! Join us on a day trip on Friday 21st of September 2018 for a guided hiking tour in the magnificent Sierra Nevada. The adventure will start from the Palacio de Congresos on Friday 21st of September at 9.15 AM so please be on time!

Additional Information:

For lunch there is no place to have lunch or buy food on this activity. It is inside a natural park surrounded by nature. Each person needs to bring with them their food and water for the day. Near to the Palacio de Congresos there are two places where food can be purchased the day before.

Mercadona Supermarket
Calle Acera del Darro, 98, 18005 Granada Open Daily from 9am to 9pm (Closed Sundays)

El Corte Ingles
(Supermarket is on basement level) Carrera de la Virgen, 20-22, 18005 Granada Open Daily from 10am to 10pm (Closed Sundays)

Suggested Kit list:

• Sunglasses-eye protection
• Sun cream and lip cream
• Water (minimum 3L)
• Lunch-snacks, energy foods etc.
• Spare waterproof clothing
• 35 to 50 litre rucksack
• Wide brimmed sun hat
• Lightweight trousers
  (shorts not recommended due to sunburn and spiky terrain!)
• Lightweight boots or trail shoes
• Lightweight waterproof and windproof jacket
• Lightweight thermal base layer
• Socks
• Lightweight fleece or softshell gilet
• Digital camera
• Trekking poles (Optional)
GALA DINNER

La Mamunia
Monday 17th Sept 2018, 08:00 PM-11:30 PM
*Bus transportation will be provided from the Conference Center starting from 07:30 PM
Geraldine McGinty MD, MBA, FACR
Chair of the ACR’s Board of Chancellors
Chief Strategy and Contracting Officer,
Weill Cornell Medicine Physician Organization

Monday, September 17-12:30-13:30

Dr. McGinty did her Medical training in Ireland at the National University and then came to the USA for residency at the University of Pittsburgh where she was Chief Resident. Her fellowship was in Women’s Imaging at the Massachusetts General Hospital. While working at Montefiore Medical Center in the Bronx she completed an MBA at Columbia University. She is an national and internationally recognized expert in imaging economics. She has served an advisor to the CPT Editorial Panel, the JCAHO and the National Quality Forum. She was Chair of the American College of Radiology’s Commission on Economics and was the radiology member of the AMA’s Relative Value Update Committee from 2012-2016. In May 2016 she was elected as the Vice Chair of the ACR’s Board of Chancellors, the first woman to hold this office. She was until 2013 Managing Partner of a 70 physician multispecialty medical group on Long Island. In 2014 she joined the faculty at Weill Cornell Medicine (WCM) in New York City. As well as her clinical practice there she serves as Chief Strategy Officer and Chief Contracting Officer for the Weill Cornell Physician Organization’s more than 1400 members. Her role as lead negotiator for managed care contracts at Weill Cornell Medicine incorporates both traditional fee for service agreements as well as shared savings arrangements. She is also a member of WCM’s digital health strategy tea. She serves as a Non-Executive Director of IDA Ireland, the national foreign direct investment agency and is also on the Medical Advisory Board of Wellthie, a healthcare technology start-up. Her published work has focused on payment models for imaging, most recently a bundled payment for breast cancer screening. In 2015 she was voted Radiology’s Most Effective Educator by the readers of Aunt Minnie, a radiology news site with more than 140,000 members. She has more than 8000 followers on Twitter.
KEYNOTES

A view from the Data Science Institute of the American College of Radiology.

The ACR represents approximately 37000 radiologists, radiation oncologists and medical physicists and is “the voice of Radiology” with policy makers and payers. In establishing its Data Science Institute in 2017, the ACR sought to achieve the following goals:

1. Ensure the value of radiologists as AI evolves through the development of appropriate use cases and workflow integration
2. Protect patients through leadership roles in the regulatory process with government agencies and validation of algorithms
3. Establish industry relationships by providing credible use cases, help with FDA and other government agencies, and pathways for clinical integration
4. Educate radiologists, other physicians and all stakeholders about AI and the ACR’s role in data science for the good of our patients

This session will describe the ACR’s vision for collaboration with a broad array of stakeholders to foster an AI ecosystem that delivers meaningful innovations in care to our patients. It will highlight the unique role that the ACR can play in collaboration with academia and industry by generating use cases, validating algorithms and enabling effective regulatory processes. I will also discuss the opportunities to use artificial intelligence tools to deliver value throughout the patient experience and the critical importance of enabling physicians to practice with empathy and avoid burnout. I’ll challenge us to seek solutions rather than headlines and to focus on the big problems that can change lives and improve health.
Prof. Paolo Dario
Director of the BioRobotics Institute
Scuola Superiore Sant’Anna, Pisa, Italy

Tuesday, September 18-12:30-13:30

Paolo Dario is a Professor of Biomedical Engineering, Coordinator of the PhD Program in BioRobotics and Director of The BioRobotics Institute of the Scuola Superiore Sant’Anna (SSSA), Pisa, Italy. He received his Dr. Eng. Degree in Mechanical Engineering from the University of Pisa, Italy, in 1977 and pursued postgraduate education with fellowships from the University of Pisa and the National Research Council of Italy (CNR). He completed his education and training as a research associate at Brown University, Providence, RI, and at the University of Pennsylvania, Philadelphia, USA.

Paolo Dario is a Visiting Professor at Zhejiang University, Hangzhou, and Tianjin University, China, having previously taken the same role at many other institutions such as Brown University or the École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland. He is Fellow of the University of Tokyo, Japan. Paolo Dario is the Founding Coordinator of the Center of Micro-BioRobotics@SSSA of the Italian Institute of Technology (IIT), being now a Senior Scientist of IIT.

During his career, he has coordinated over 60 European projects, 50 national projects and 50 industrial projects. Paolo Dario is the editor of two books on robotics and the author of over 500 scientific papers. Paolo Dario is an IEEE Fellow, and he has served as President of the IEEE Robotics and Automation Society in 2002 and 2003. Prof. Dario is a Fellow of the European Society on Medical and Biological Engineering, a member of the Board of the International Foundation of Robotics Research (IFRR), and he has also served as Vice-President of the International Society for Gerontotechnology. Paolo Dario is a member of the International Scientific Committee of the Institute for Bioengineering of Catalonia (IBEC), and the International Scientific Committee of the Filarete Foundation in Milan, Italy. Paolo Dario has also served two terms (2008-2010) as Member of the ISTAG (IST Advisory Group) of the EU and has been a Member of the Global Agenda Council on Robotics and Smart Devices of the World Economic Forum.
KEYNOTES

The Adventure of Capsule Endoscopy: a “Fantastic Voyage” from Science Fiction to Clinics and Beyond

The evolution of Surgical Robotics is a very interesting and inspiring story, and can be regarded as a paradigm of the challenges and accomplishments of Robotics in the last three decades. Considered, initially, as little less than science fiction and a field for visionaries, Surgical Robotics has evolved to reach full clinical acceptability and the status of a widely cited success story on how to create a highly profitable industry and a new market, virtually from scratch.

Whereas teleoperated and autonomous surgical robots are continuing to find new applications and their room in clinical practice and industry, the field of Endoluminal Robotics is emerging from research to clinical application and industrial development. Capsule Endoscopy is part of this evolution. In addition, the technology of Capsule Endoscopy has several distinctive and very interesting features and the potential to contribute to address many current and new clinical needs. For these reasons, the evolution of Capsule Endoscopy deserves to be analyzed in detail, and its future to be discussed as one of the most promising also for medical imaging and computer-assisted surgery.

In this presentation, the challenges, the solutions, the failures and the successes of different Endoscopic Capsules will be discussed, the main technical reasons for failure and for success will be analyzed, and the extraordinary potential of this technology will be outlined. The story of Capsule Endoscopy will be presented with emphasis on the robotic challenges it poses: an adventure, a real saga and a new frontier of ultra-minimally invasive surgery, all requiring advanced functionalities, increased efficiency, better dependability, and simple miniaturized mechanisms designed for real clinical applicability.
Prof. Kristen Grauman
Facebook AI Research & Professor in the Department of Computer Science at the University of Texas at Austin

Tuesday, September 18-15:30-16:30

Kristen Grauman is a Professor in the Department of Computer Science at the University of Texas at Austin and a Research Scientist at Facebook AI Research. Her research in computer vision and machine learning focuses on visual recognition and search. Before joining UT-Austin in 2007, she received her Ph.D. at MIT in computer science. She is an Alfred P. Sloan Research Fellow, a recipient of NSF CAREER and ONR Young Investigator awards, the 2013 PAMI Young Researcher Award, the 2013 Computers and Thought Award, a Presidential Early Career Award for Scientists and Engineers (PECASE), and a 2017 Helmholtz Prize computer vision “test of time” award. She and her collaborators were recognized with best paper awards at CVPR 2018, ICCV 2011, and ACCV 2016. She previously served as Program Chair of CVPR in 2015 and currently serves as Associate Editor in Chief for PAMI and as Program Chair of NIPS 2018.
See, Hear, Move: Towards Embodied Visual Perception

Computer vision has seen major success in learning to recognize objects from massive “disembodied” Web photo collections labeled by human annotators. Yet cognitive science tells us that perception develops in the context of acting and moving in the world---and without intensive supervision. Meanwhile, many realistic vision tasks require not only categorizing a well-composed human-taken photo, but also intelligently deciding where to look in the first place. In the context of these challenges, we are exploring ways to learn visual representations from unlabeled video accompanied by multi-modal sensory data like egomotion and sound. Moving from passively captured video to agents that control their own first-person cameras, we investigate how to move to intelligently acquire visual observations. We present reinforcement learning approaches for active and exploratory look-around behavior, which show promising results for transferring policies to novel perception tasks and unseen environments.
Prof. Bradley Nelson
Prof. of Robotics and Intelligent Systems
ETH Zürich

Wednesday, September 19-12:30-13:30

Bradley Nelson has been the Professor of Robotics and Intelligent Systems at ETH Zürich since 2002, where his research focuses on microrobotics and nanorobotics. He studied mechanical engineering at the University of Illinois and the University of Minnesota, worked as a computer vision researcher at Honeywell and a software engineer at Motorola, served as a United States Peace Corps Volunteer in Botswana, Africa, and then obtained a Ph.D. in Robotics from Carnegie Mellon University. He was an Assistant Professor at the University of Illinois at Chicago and an Associate Professor at the University of Minnesota before moving to ETH. Prof. Nelson has over thirty years of experience in the field of robotics and has received a number of awards for his work in robotics, nanotechnology, and biomedicine. His lab is the undefeated international champion in Robocup’s Nanogram Soccer League, and he is in the Guinness Book of World Records for the “Most Advanced Mini Robot for Medical Use.” Prof. Nelson serves on the advisory boards of several academic departments and research institutes across North America, Europe, and Asia and is on the editorial boards of several academic journals. He has been the Department Head of Mechanical and Process Engineering at ETH, Chairman of the ETH Electron Microscopy Center, and is a member of the Research Council of the Swiss National Science Foundation. He is also a member of the board of directors of three Swiss companies.
Soft Microrobotics and its Application in Medicine

Abstract: The field of micro and nano robotics has made impressive strides over the past decade as researchers have created a variety of small devices capable of locomotion within liquid environments. Robust fabrication techniques have been developed, some devices have been functionalized for potential applications, and therapies are being actively considered.

While excitement remains high for this field, a number of challenges must be addressed if continued progress towards clinical relevance is to be made, including the development of bioerodable and non-cytotoxic microrobots, development of autonomous devices capable of self-directed targeting, catheter-based delivery of microrobots near the target, and tracking and control of swarms of devices in vivo.

As we consider advancements that are on the horizon, it becomes clear that the field of micro and nanorobotics is moving away from hard microfabricated devices and towards soft, polymeric structures capable of shape modification induced by environmental conditions and other “smart” behaviors. Just as the field of robotics witnessed the emergence of “soft robotics” in which soft and deformable materials are used as primary structural components, the field of microrobotics is beginning to experience a move towards “soft microrobots.” Soft microrobots are made of soft, deformable materials capable of sensing and actuation and have the potential to exhibit behavioral response. As we develop more complex soft microrobots, we are poised to realize intelligent microrobots that autonomously respond to their environment to perform more complex tasks.

Bio: Brad Nelson has been the Professor of Robotics and Intelligent Systems at ETH Zürich since 2002. He has over thirty years of experience in the field of robotics and has received a number of awards in the fields of robotics, nanotechnology, and biomedicine.
17 September 2018, Monday

07:00-08:00  MICCAI Running

08:30-09:30  Registration

09:30-10:00  Opening Session
Federico Garcia Lorca-Main Auditorium

10:00-11:00  Oral Session I-Reconstruction and Image Quality
Federico Garcia Lorca-Main Auditorium
Chairs: Stefanie Demirci, Tanveer Syeda-Mahmood

10:00-10:15  Adversarial Sparse-View CBCT Artifact Reduction
Haofu Liao*, Zhimin Huo, William Sehnert, S. Kevin Zhou, Jiebo Luo

10:15-10:30  Multi-channel Generative Adversarial Network for Parallel
Magnetic Resonance Image Reconstruction in K-space
Pengyue Zhang*, Fushen Wang, Wei Xu, Yulee Li

10:30-10:45  3D Fetal Skull Reconstruction from 2DUS via Deep Conditional
Generative Networks
Juan J. Cerrolaza*, Yuanwei Li, Carlo Biffi, Alberto Gomez, Matthew Sinclair,
Jacqueline Matthew, Caroline Knight, Bernhard Kainz, Daniel Rueckert

10:45-10:50  Phase-Sensitive Region-of-Interest Computed Tomography
Lina Felsner*, Martin Berger, Sebastian Kaeppler, Johannes Bopp, Veronika
Ludwig, Thomas Weber, Georg Pelzer, Thilo Michel, Andreas K Maier, Gisela Anton,
Christian Riess

10:50-10:55  Cardiac MR Segmentation from Undersampled k-space using Deep
Latent Representation Learning
Jo Schlemper*, Ozan Oktay, Wenjia Bai, Daniel Coelho de Castro, Jinming Duan,
Chen Qin, Joseph Hajnal, Daniel Rueckert

10:55-11:00  Automatic, Fast and Robust Characterization of Noise
Distributions for Diffusion MRI
Samuel St-Jean*, Alberto De Luca, Max Viergever, Alexander Leemans

11:00-11:30  Coffee Break

11:30-12:30  Poster Session I
Reconstruction and Image Quality
Machine Learning and Statistical Analysis
12:30-13:30  **Keynote 1: Geraldine McGinty. “A view from the Data Science Institute of the American College of Radiology”**.

13:30-15:00  **Lunch / Women at MICCAI Lunch**

15:00-16:15  **Oral Session II-Machine learning and statistical analysis**  
*Federico Garcia Lorca-Main Auditorium*  
**Chairs:** Ivana Isgum, Rafael Molina

15:00-15:15  **Concurrent Spatial and Channel ‘Squeeze & Excitation’ in Fully Convolutional Networks**  
Abhijit Guha Roy*, Nassir Navab, Christian Wachinger

15:15-15:30  **Roto-Translation Covariant Convolutional Networks for Medical Image Analysis**  
Erik J Bekkers*, Maxime Lafarge, Mitko Veta, Koen Eppeholf, Josien Pluim, Remco Duits

15:30-15:45  **Distribution Matching Losses Can Hallucinate Features in Medical Image Translation**  
Joseph Paul Cohen*, Margaux Luck, Sina Honari

15:45-16:00  **Training Medical Image Analysis Systems like Radiologists**  
Gabriel Maicas*, Andrew Bradley, Jacinto Nascimento, Ian Reid, Gustavo Carneiro

16:00-16:15  **Exploring Uncertainty Measures in Deep Networks for Multiple Sclerosis Lesion Detection and Segmentation**  
Tanya Nair, Doina Precup, Douglas Arnold, Tal Arbel*

16:15-16:45  **Coffee Break**

16:45-18:00  **Oral Session III-Registration and Image Guidance**  
*Federico Garcia Lorca-Main Auditorium*  
**Chairs:** Bennett A Landman, Hassan Rivaz

16:45-17:00  **Unsupervised Learning for Fast Probabilistic Diffeomorphic Registration**  
Adrian V Dalca*, Guha Balakrishnan, John Guttag, Mert Sabuncu

17:00-17:15  **Adversarial Similarity Network for Evaluating Image Alignment in Deep Learning based Registration**  
Jingfan Fan*, Xiao Huan Cao, Zhong Xue, Pew-Thian Yap, Dinggang Shen

17:15-17:30  **Elastic Registration of Geodesic Vascular Graphs**  
Stefano Moriconi*, Maria A. Zuluaga, Rolf Jäger, Parashkev Nachev, Sebastien Ourselin, M. Jorge Cardoso
## Conference Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>17:30-17:45</td>
<td><strong>Hierarchical Spherical Deformation for Shape Correspondence</strong></td>
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<tr>
<td></td>
<td>Ilwoo Lyu*, Martin Styner, Bennett A Landman</td>
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<tr>
<td>17:45-17:50</td>
<td><strong>Improving Surgical Training Phantoms by Hyperrealism: Deep Unpaired Image-to-Image Translation from Real Surgeries</strong></td>
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<td>Sandy Engelhardt*, Raffale De Simone, Peter M. Full, Matthias Karck, Ivo Wolf</td>
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<td>17:50-17:55</td>
<td><strong>Uncertainty in Multitask Learning: Joint Representations for Probabilistic MR-only Radiotherapy Planning</strong></td>
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<td>Felix JS Bragman*, Ryutaro Tanno, Zach Eaton-Rosen, Wenqi Li, David Hawkes, Sebastien Ourselin, Daniel Alexander, Jamie R McClelland, M. Jorge Cardoso</td>
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<tr>
<td>17:55-18:00</td>
<td><strong>A Combined Simulation &amp; Machine Learning Approach for Image-based Force Classification during Robotized Intravitreal Injection</strong></td>
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<td>Andrea Mendizabal*, Jan Hermann, Tatiana Fountoukidou, Raphael Sznitman, Stephane Cotin</td>
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<tr>
<td>18:00-19:30</td>
<td><strong>Poster Session II</strong></td>
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<td>Registration and Image Guidance</td>
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<td>Optical and Histology Applications</td>
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<td>19:30</td>
<td><strong>Departure to Gala Dinner</strong></td>
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<td>20:00-23:30</td>
<td><strong>MICCAI 2018 Gala Dinner</strong></td>
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### 18 September 2018, Tuesday

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>07:00-08:00</td>
<td><strong>MICCAI Running</strong></td>
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<tr>
<td>08:30-09:30</td>
<td><strong>Registration</strong></td>
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<tr>
<td>09:30-11:00</td>
<td><strong>Parallel Oral Sessions IV-A &amp; IV-B</strong></td>
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<td>Oral Session IV-A-Optical and Histology Applications</td>
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<td>Federico García Lorca-Main Auditorium</td>
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<td><strong>Chairs:</strong> Martin Urschler, Arrate Muñoz Barrutia</td>
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<tr>
<td>09:30-09:45</td>
<td><strong>Instance Segmentation and Tracking with Cosine Embeddings and Recurrent Hourglass Networks</strong></td>
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<td>Christian Payer*, Darko Stern, Thomas Neff, Horst Bischof, Martin Urschler</td>
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<td>09:45-10:00</td>
<td><strong>A Pixel-wise Distance Regression Approach for Joint Retinal Optical Disc and Fovea Detection</strong></td>
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<td>Maria Ines Ferraz Meyer*, Adrian Galdran, Ana Maria Mendonça, Aurélio Campilho</td>
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10:00-10:15  Predicting Cancer with a Recurrent Visual Attention Model for Histopathology Images  
Aicha BenTaieb*, Ghassan Hamarneh

10:15-10:30  Model-based Refinement of Nonlinear Registrations in 3D Histology Reconstruction  
Juan Eugenio Iglesias*, Marco Lorenzi, Sebastiano Ferraris, Loic Peter, Marc Modat, Allison Stevens, Bruce Fischl, Tom Vercauteren

10:30-10:45  Adversarial Domain Adaptation for Classification of Prostate Histopathology Whole-Slide Images  
Jian Ren*, Ilker Hacihaliloglu, Eric Singer, David Foran, Xin Qi

10:45-11:00  A Cascaded Refinement GAN for Phase Contrast Microscopy Image Super Resolution  
Liang Han, Zhaozheng Yin*

Oral Session IV-B-fMRI and Diffusion Imaging  
Manuel De Falla Auditorium-Level 1  
Chairs: Ragini Verma, Lilla Zöllei

09:30-09:45  Tract Orientation Mapping for Bundle-Specific Tractography  
Jakob Wasserthal, Peter F Neher, Klaus H. Maier-Hein*

09:45-10:00  A Global Estimation Framework for Asymmetric Fiber Orientation Distributions  
Ye Wu*, Yuanjing Feng, Dinggang Shen, Pew-Thian Yap

10:00-10:15  Harmonizing Diffusion MRI Data across Magnetic Field Strengths  
Suheyla Cetin Karayumak*, Marek Kubicki, Yogesh Rathi

10:15-10:30  A Region-of-Interest-Reweight 3D Convolutional Neural Network for the Analytics of Brain Information Processing  
Xiuyan Ni*, Zhennan Yan, Tingting Wu, Jin Fan, Chao Chen

10:30-10:45  Quantitative Deconvolution of fMRI data with Multiecho Sparse Paradigm Free Mapping  
Cesar Caballero-Gaudes*, Stefano Moia, Peter A. Bandettini, Javier Gonzalez-Castillo

10:45-11:00  Brain Decoding from Functional MRI using Long Short-Term Memory Recurrent Neural Networks  
Hongming Li*, Yong Fan

11:00-11:30  Coffee Break
CONFERENCE PROGRAM

11:30-12:30  **Poster Session III**  
*Cardiac, Chest and Abdominal Applications*

12:30-13:30  **Keynote 2: Paolo Dario. The Adventure of Capsule Endoscopy: A “Fantastic Voyage” from Science Fiction to Clinics and Beyond**

13:30-15:00  **Lunch / MedIA Editorial Board Lunch**

15:00-15:30  **MICCAI Society Update**


16:30-17:00  **Coffee Break**

17:00-18:15  **Parallel Oral Sessions V-A & V-B**  
*Oral Session V-A-Cardiac, Chest and Abdominal applications*  
**Federico García Lorca-Main Auditorium**  
**Chairs:** Linwei Wang, María Jesús Ledesma Carbayo

17:00-17:15  **Quantifying Tensor Field Similarity With Global Distributions and Optimal Transport**  
*Arnold Gomez*, Maureen Stone, Philip Bayly, Jerry Prince

17:15-17:30  **Factorised Spatial Representation Learning: Application in Semi-supervised Myocardial Segmentation**  
*Agisilaos Chartsias*, Thomas Joyce, Giorgos Papanastasiou, Scott Semple, Michelle Williams, David Newby, Rohan Dharmakumar, Sotirios Tsaftaris

17:30-17:45  **High-dimensional Bayesian Optimization of Personalized Cardiac Model Parameters via an Embedded Generative Model**  
*Jwala Dhamala*, Sandesh Ghimire, John L. Sapp, Bohumil Milan Horacek, Linwei Wang

17:45-18:00  **TextRay: Mining Clinical Reports to Gain a Broad Understanding of Chest X-rays**  
*Jonathan Laserson*, Christine Dan Lantsman, Michal Cohen-Sdady, Itamar Tamir, Eli Goz, Chen Brestel, Shir Bar, Maya Atar, Eldad Elnekave

18:00-18:15  **Task Driven Generative Modeling for Unsupervised Domain Adaptation: Application to X-ray Image Segmentation**  
*Yue Zhang*, Shun Miao, Tommaso Mansi, Rui Liao
Oral Session V-B-Neuroimaging
Manuel De Falla Auditorium-Level 1
Chairs: Ipek Oguz, Verónica Vilaplana

17:00-17:15 Exploratory Population Analysis with Unbalanced Optimal Transport
Samuel Gerber*, Marc Niethammer, Martin Styner, Stephen R Aylward

17:15-17:30 Learning Myelin Content in Multiple Sclerosis from Multimodal MRI through Adversarial Training
Wen Wei*, Emilie Poirion, Benedetta Bodini, Stanley Durrleman, Nicholas Ayache, Bruno Stankoff, Olivier Colliot

17:30-17:45 Generative Discriminative Models for Multivariate Inference and Statistical Mapping in Medical Imaging
Erdem Varol*, Aristeidis Sotiras, Ke Zeng, Christos Davatzikos

17:45-18:00 Using the Anisotropic Laplace Equation to Compute Cortical Thickness
Anand Joshi*, Chitresh Bhushan, Ronald Salloum, Jessica Wisnowski, David Shattuck, Richard Leahy

18:00-18:15 Multi-Label Transduction for Identifying Disease Comorbidity Patterns
Ehsan Adeli*, Dongjin Kwon, Kilian Pohl

18:15-19:45 Poster Session IV
fMRI and Diffusion Imaging
Neuroimaging

19:45-20:45 Networking at Posters
19 September 2018, Wednesday

07:00-08:00  MICCAI Running

08:30-09:30  Registration

09:30-11:00  Oral Session VI-Computer Assisted Intervention
             Federico Garcia Lorca-Main Auditorium
             Chairs: Caroline Essert, Pablo Tahoces

09:30-09:45  X-ray-transform Invariant Anatomical Landmark Detection for Pelvic
             Trauma Surgery
             Bastian Bier*, Mathias Unberath, Jan-Nico Zaech, Javad Fotouhi, Mehran
             Armand, Greg Osgood, Nassir Navab, Andreas K Maier

09:45-10:00  Endoscopic Navigation in the Absence of CT Imaging
             Ayushi Sinha*, Xingtong Liu, Austin Reiter, Masaru Ishii, Gregory D. Hager,
             Russell H. Taylor

10:00-10:15  Spatiotemporal Manifold Prediction Model for Anterior Vertebral
             Body Growth Modulation Surgery in Idiopathic Scoliosis
             William Mandel, Olivier Turcot, Dejan Knez, Stefan Parent, Samuel Kadoury*

10:15-10:30  Evaluating Surgical Skills from Kinematic Data using Convolutional
             Neural Networks
             Hassan Ismail Fawaz*, Germain Forestier, Jonathan Weber, Lhassane Idoumghar,
             Pierre-Alain Muller

10:30-10:45  Volumetric Clipping Surface: Un-occluded Visualization of Structures
             Preserving Depth Cues into Surrounding Organs
             Bhavya Ajani, Aditya Bharadwaj, Karthik Krishnan*

10:45-10:50  Needle Tip Force Estimation using an OCT Fiber and a Fused convGRU-
             CNN Architecture
             Nils Gessert*, Torben Priegnitz, Thore Saathoff, Sven-Thomas Antoni, David
             Meyer, Moritz Franz Hamann, Klaus-Peter Jünemann, Christoph Otte, Alexander
             Schlaefer

10:50-10:55  Closing the Calibration Loop: An Inside-out-tracking Paradigm for
             Augmented Reality in Orthopedic Surgery
             Jonas Hajek, Mathias Unberath*, Javad Fotouhi, Bastian Bier, Sing Chun Lee, Greg
             Osgood, Andreas K Maier, Mehran Armand, Nassir Navab

10:55-11:00  Higher Order of Motion Magnification for Vessel Localisation in
             Surgical Video
             Mirek Janatka*, Ashwin Sridhar, John Kelly, Danail Stoyanov
11:00-11:30 **Coffee Break**

11:30-12:30 **Poster Session V**
Computer Assisted Intervention
Segmentation


13:30-13:30 **Lunch / IJCARS Editorial Board Lunch**

15:00-17:00 **Oral Session VII - Segmentation**
Federico García Lorca - Main Auditorium
**Chairs:** Miaomiao Zhang, Laura Igual

15:00-15:15 **MS-Net: Mixed-Supervision Fully-Convolutional Networks for Full-Resolution Segmentation**
Meet Shah, Shabbir Merchant, Suyash P. Awate*

15:15-15:30 **Autofocus Layer for Semantic Segmentation**
Yao Qin, Konstantinos Kamnitsas, Siddharth Ancha, Jay Nanavati, Garrison Cottrell, Antonio Criminisi, Aditya Nori*

15:30-15:45 **3D Segmentation with Exponential Logarithmic Loss for Highly Unbalanced Object Sizes**
Ken C. L. Wong*, Mehdi Moradi, Hui Tang, Tanveer Syeda-Mahmood

15:45-15:50 **Revealing Regional Associations of Cortical Folding Alterations with In Utero Ventricular Dilation Using Joint Spectral Embedding**
Oualid Benkarim*, Gerard Sanroma, Gemma Piella, Islam Rekik, Nadine Hahner, Elisenda Eixarch, Miguel Angel González Ballester, Dinggang Shen, Gang Li

15:50-15:55 **CompNet: Complementary Segmentation Network for Brain MRI Extraction**
Raunak Dey*, Yi Hong

15:55-16:00 **The Deep Poincaré Map: A Novel Approach for Left Ventricle Segmentation**
Yuanhan Mo*, Fangde Liu, Mcilwraith Douglas, Guang Yang, Jingqing Zhang, Taigang He, Yike Guo

16:00-16:15 **How to Exploit Weaknesses in Biomedical Challenge Design and Organization**
Annika Reinke*, Matthias Eisenmann, Sinan Onogur, Marko Stankovic, Patrick Scholz, Peter Full, Hrvoje Bogunovic, Bennett A Landman, Oskar Maier, Bjoern Menze, Gregory Sharp, Korsuk Sirinkunikumwattana, Stefanie Speidel, Fons van der Sommen, Guoyan Zheng, Henning Müller, Michal Kozubek, Tal Arbel, Andrew Bradley, Pierre Jannin, Anette Kopp-Schneider
<table>
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<tr>
<th>Time</th>
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| 16:15-16:30  | **Semi-Supervised Learning for Segmentation under Semantic Constraint**  
Pierre-Antoine Ganaye*, Michael Sdika, Hugues Benoit-Cattin |
| 16:30-16:45  | **Training Multi-organ Segmentation Networks with Sample Selection by Relaxed Upper Confident Bound**  
Yan Wang*, Yuyin Zhou, Peng Tang, Wei Shen, Elliot K Fishman, Alan Yuille |
| 16:45-16:50  | **Bayesian VoxDRN: A Probabilistic Deep Voxelwise Dilated Residual Network for Whole Heart Segmentation from 3D MR Images**  
Zenglin Shi, Guodong Zeng, Le Zhang, Xiahai Zhuang, Lei Li, Guang Yang, Guoyan Zheng* |
| 16:50-16:55  | **Accurate Detection of Inner Ears in Head CTs Using a Deep Volume-to-Volume Regression Network with False Positive Suppression and a Shape-Based Constraint**  
Dongqing Zhang*, Jianing Wang, Jack Noble, Benoit Dawant |
| 16:55-17:00  | **Accurate and Robust Segmentation of the Clinical Target Volume for Prostate Brachytherapy**  
Davood Karimi*, Qi Zeng, Prateek Mathur, Apeksha Avinash, Ingrid Spadinger, Sara Mahdavi, Purang Abolmaesumi, Septimiu Salcudean |
| 17:00-17:30  | **Coffee Break**                                                                            |
| 17:30-18:30  | **MICCAI Awards and Closing Ceremony**                                                      |
| 19:00-20:30  | **MICCAI Football + Alhambra Visit (For pre-purchased tickets ONLY)**                      |
Monday, September 17

11:30-12:30 Poster Session I

Reconstruction and Image Quality

Chairs: Ender Konukoglu, Javier Pascau

M-1  Conditional Generative Adversarial Networks for Metal Artifact Reduction in CT Images of the Ear
Jianing Wang*; Yiyuan Zhao; Jack Noble; Benoit Dawant

M-2  Neural Network Evolution Using Expedited Genetic Algorithm for Medical Image Denoising
Peng Liu*; Yangjunyi Li; Mohammad D El Basha; Ruogu Fang

M-3  Deep Convolutional Filtering for Spatio-temporal Denoising and Artifact Removal in Arterial Spin Labelling MRI
David Owen*; Andrew Melbourne; Zach Eaton-Rosen; David Thomas; Neil Marlow; Jonathan Rohrer; Sebastien Ourselin

M-4  DeepASL: Kinetic Model Incorporated Loss for Denoising Arterial Spin Labeled MRI via Deep Residual Learning
Cagdas Ulas*; Giles Tetteh; Stephan Kaczmarz; Christine Preibisch; Bjoern Menze

M-5  Direct Estimation of Pharmacokinetic Parameters from DCE-MRI using Deep CNN with Forward Physical Model Loss
Cagdas Ulas*; Giles Tetteh; Michael Thrippleton; Paul Armitage; Stephen Makin; Joanna Wardlaw; Mike Davies; Bjoern Menze

M-6  Short Acquisition Time PET/MR Pharmacokinetic Modelling usin CNNs
Catherine Scott*; Jieqing Jiao; M. Jorge Cardoso; Kerstin Kläser; Andrew Melbourne; Pawel Markiewicz; Jonathan Schott; Brian Hutton; Sebastien Ourselin

M-7  Can Deep Learning Relax Endomicroscopy Hardware Miniaturization Requirements?
Saeed Izadi*; Kathleen P. Moriarty; Ghassan Hamarneh

M-8  A Framework to Objectively Identify Reference Regions for Normalizing Quantitative Imaging
Amir Fazlollahi*; Scott Ayton; pierrick Bourgeat; Ibrahima Diouf; Parnesh Raniga; Jurgen Fripp; James Doecke; David Ames; Colin Masters; Christopher Rowe; Victor Villemagne; Ashley Bush; Olivier Salvado
M-9 Evaluation of Adjoint Methods in Photoacoustic Tomography with Under-Sampled Sensors
Hongxiang Lin*; Takashi Azuma; Mehmet Burcin Unlu; Shu Takagi

M-10 A No-Reference Retinal Vessel Tree Segmentation Quality Metric
Adrian Galdran*; Pedro Costa; Alessandro Bria; Teresa Araújo; Ana Maria Mendonça; Aurélio Campilho

M-11 Efficient and Accurate MRI Super-Resolution using a Generative Adversarial Network and 3D Multi-Level Densely Connected Network
Yuhua Chen*; Feng Shi; Anthony Christodoulou; Yibin Xie; Zhengwei Zhou; Debiao Li

M-12 A Deep Learning based Anti-aliasing Self Super-resolution Algorithm for Magnetic Resonance Imaging
Can Zhao*; Aaron Carass; Blake E Dewey; Jonghye Woo; Jiwon Oh; Peter Calabresi; Daniel Reich; Pascal sati; Dzung Pham; Jerry Prince

M-13 Gradient Profile Based Super Resolution of MR Images with Induced Sparsity
Prabhjot Kaur*; Anil Kumar Sao

M-14 Deeper Image Quality Transfer: Training Low-Memory Neural Networks for 3D Images
Stefano B Blumberg*; Ryutaro Tanno; Iason Kokkinos; Daniel Alexander

M-15 High Frame-rate Cardiac Ultrasound Imaging with Deep Learning
Ortal Senouf*; Sanketh Vedula; Grigoriy Zurakhov; Alex Bronstein; Michael Zibulevsky; Dan Adam; Oleg Michailovich; David S. Blondheim

M-16 Phase-Sensitive Region-of-Interest Computed Tomography
Lina Felsner*; Martin Berger; Sebastian Kaeppler; Johannes Bopp; Veronika Ludwig; Thomas Weber; Georg Pelzer; Thilo Michel; Andreas K Maier; Gisela Anton; Christian Riess

M-17 Some Investigations on Robustness of Deep Learning in Limited Angle Tomography
Yixing Huang*; Tobias Wuerfl; Katharina Breininger; Ling Liu; Guenter Lauritsch; Andreas K Maier

M-18 Adversarial Sparse-View CBCT Artifact Reduction
Haofu Liao*; Zhimin Huo; William Sehnert; S. Kevin Zhou; Jiebo Luo

M-19 Nasal Mesh Unfolding—an Approach to Obtaining 2-D Skin Templates from 3-D Nose Models
Hongying Li*; Marc Robini; Zhongwei Zhou; Wei Tang; Yuemin Zhu
**M-20**  
**Towards Generating Personalized Volumetric Phantom from Patient’s Surface Geometry**  
Yifan Wu*; Vivek Singh; Brian Teixeira; Kai Ma; Birgi Tamersoy; Andreas Krauss; Terrence Chen

**M-21**  
**Multi-channel Generative Adversarial Network for Parallel Magnetic Resonance Image Reconstruction in K-space**  
Pengyue Zhang*; Fushen Wang; Wei Xu; Yulee Li

**M-22**  
**A Learning-based Metal Artifacts Correction Method for MRI using Dual-Polarity Readout Gradients and Simulated Data**  
Kinam Kwon; Dongchan Kim; HyunWook Park*

**M-23**  
**Motion Aware MR Imaging via Spatial Core Correspondence**  
Christoph Jud*; Damien Nguyen; Robin Sandkuehler; Alina Giger; Oliver Bieri; Philippe C. Cattin

**M-24**  
**Nonparametric Density Flows for MRI Intensity Normalisation**  
Daniel Coelho de Castro*; Ben Glocker

**M-25**  
**Ultra-fast T2-weighted MR Reconstruction using Complementary T1-weighted Information**  
Lei Xiang*; Yong Chen; Chang Weitang; Yiqiang Zhan; Weili Lin; Qian Wang; Dinggang Shen

**M-26**  
**Image Reconstruction by Splitting Deep Learning Regularization from Iterative Inversion**  
Jiulong Liu; Tao Kuang; Xiaojun Zhang*

**M-27**  
**Adversarial and Perceptual Refinement for Compressed Sensing MRI Reconstruction**  
Maximilian Seitzer*; Guang Yang; Jo Schlemper; Ozan Oktay; Tobias Wuerfli; Vincent Christlein; Tom Wong; Raad Mohiaddin; David Firmin; Jennifer Keegan; Daniel Rueckert; Andreas K Maier

**M-28**  
**Translation of 1D Inverse Fourier Transform of K-space to an Image based on Deep Learning for Accelerating Magnetic Resonance Imaging**  
Taejoon Eo*; Hyungseob Shin; Taeseong Kim; Yohan Jun; Dosik Hwang

**M-29**  
**Deep Learning using K-space Based Data Augmentation for Automated Cardiac MR Motion Artefact Detection**  
Ilkay Oksuz; Bram Ruijsink; Esther Puyol Antor; Aurelien Bustin*; Gastao Cruz; Claudia Prieto; Daniel Rueckert; Julia A Schnabel; Andrew King

**M-30**  
**Cardiac MR Segmentation from Undersampled k-space using Deep Latent Representation Learning**  
Jo Schlemper*; Ozan Oktay; Wenjia Bai; Daniel Coelho de Castro; Jinming Duan; Chen Qin; Joseph Hajnal; Daniel Rueckert
M-31  **Stochastic Deep Compressive Sensing for the Reconstruction of Diffusion Tensor Cardiac MRI**  
Jo Schlemper; Guang Yang*; Pedro Ferreira; Andrew Scott; Laura-Ann McGill; Zohya Khalique; Margarita Gorodezky; Malte Roehl; Jennifer Keegan; Dudley Pennell; David Firmin; Daniel Rueckert

M-32  **A Comprehensive Approach for Learning-based Fully-Automated Inter-slice Motion Correction for Short-Axis Cine Cardiac MR Image Stacks**  
Giacomo Tarroni*; Ozan Oktay; Matthew Sinclair; Wenjia Bai; Andreas Schuh; Hideaki Suzuki; Antonio de Marvao; Declan O’Regan; Stuart Cook; Daniel Rueckert

M-33  **Automatic View Planning with Multi-scale Deep Reinforcement Learning Agents**  
Amir Alansary*; Loic Le Folgoc; Ghislain Vaillant; Ozan Oktay; Yuanwei Li; Wenjia Bai; Jonathan Passerat-Palmbach; Ricardo Guerrero; Konstantinos Kamnitsas; Benjamin Hou; Steven McDonagh; Ben Glocker; Bernhard Kainz; Daniel Rueckert

M-34  **Automatic, Fast and Robust Characterization of Noise Distributions for Diffusion MRI**  
Samuel St-Jean*; Alberto De Luca; Max Viergever; Alexander Leemans

M-35  **Towards MR-Only Radiotherapy Treatment Planning: Synthetic CT Generation Using Multi-view Deep Convolutional Neural Networks**  
Yu Zhao*; Shu Liao; Yimo Guo; Liang Zhao; Zhennan Yan; Sungmin Hong; Gerardo Hermosillo; Tianming Liu; Xiang Zhou; Yiqiang Zhan

M-36  **An Automated Localization, Segmentation and Reconstruction Framework for Fetal Brain MRI**  
Michael Ebner*; Guotai Wang; Wenqi Li; Michael Aertsen; Premal Patel; Rosalind Aughwane; Andrew Melbourne; Tom Doel; Anna L. David; Jan Deprest; Sebastien Ourselin; Tom Vercauteren

M-37  **Retinal Image Understanding Emerges from Self-Supervised Multimodal Reconstruction**  
Álvaro S Hervella*; José Rouco; Jorge Novo; Marcos Ortega

M-38  **Locality Adaptive Multi-modality GANs for High-quality PET Image Synthesis**  
Yan Wang; Luping Zhou*; Lei Wang; Biting Yu; Chen Zu; David Lalush; Weili Lin; Xi Wu; Jiliu Zhou; Dinggang Shen

M-39  **Joint PET+MRI Patch-based Dictionary for Bayesian Random Field PET Reconstruction**  
Viswanath PS*; Zhaolin Chen; Suyash P. Awate

M-40  **Analysis of 3D Facial Dysmorphology in Genetic Syndromes from Unconstrained 2D Photographs**  
Liyun Tu*; Antonio Reyes Porras Perez; Alec Boyle; Marius Linguraru
M-41 Dual-Domain Cascaded Regression for Synthesizing 7T from 3T MRI
Yongqin Zhang*; Jiezhi Cheng; Lei Xiang; Pew-Thian Yap; Dinggang Shen

M-42 Double Your Views-Exploiting Symmetry in Transmission Imaging
Alexander Preuhs*; Andreas K Maier; Michael Manhart; Javad Fotouhi; Nassir Navab; Mathias Unberath

M-43 Real Time RNN Based 3D Ultrasound Scan Adequacy for Developmental Dysplasia of the Hip
Olivia Paserin*; Kishore Mulpuri; Anthony Cooper; Antony J Hodgson; Rafeef Abugharbieh

M-44 Direct Reconstruction of Ultrasound Elastography Using an End-to-End Deep Neural Network
Sitong Wu; Zhifan Gao; Jianwen Luo; Zhi Liu*; Heye Zhang; Shuo Li

M-45 3D Fetal Skull Reconstruction from 2DUS via Deep Conditional Generative Networks
Juan J. Cerrolaza*; Yuanwei Li; Carlo Biffi; Alberto Gomez; Matthew Sinclair; Jacqueline Matthew; Caroline Knight; Bernhard Kainz; Daniel Rueckert

M-46 Towards Radiotherapy Enhancement and Real Time Tumor Radiation Dosimetry Through 3D Imaging of Gold Nanoparticles using XFCT
Caroline Vienne*; Adrien Stolidi; Hermine Lemaire; Daniel Maier; Diana Renaud; Romain Grall; Sylvie Chevillard; Emilie Brun; Cecile Sicard; Olivier Limousin

M-47 Standard Plane Detection in 3D Fetal Ultrasound Using an Iterative Transformation Network
Yuanwei Li*; Bishesh Khanal; Benjamin Hou; Amir Alansary; Juan Cerrolaza; Matthew Sinclair; Jacqueline Matthew; Chandni Gupta; Caroline Knight; Bernhard Kainz; Daniel Rueckert

Machine Learning and Statistical Analysis

Chairs: Marleen de Bruijne, Jose V. Manjon

M-48 Fast Multiple Landmark Localisation Using a Patch-based Iterative Network
Yuanwei Li*; Amir Alansary; Juan Cerrolaza; Bishesh Khanal; Matthew Sinclair; Jacqueline Matthew; Chandni Gupta; Caroline Knight; Bernhard Kainz; Daniel Rueckert

M-49 SPNet: Shape Prediction using a Fully Convolutional Neural Network
SM Masadur Raman Al Arif*; Karen Knapp; Greg Slabaugh

M-50 Roto-Translation Covariant Convolutional Networks for Medical Image Analysis
Erik J Bekkers*; Maxime Lafarge; Mitko Veta; Koen Eppehof; Josien Pluim; Remco Duits

M-51 Bimodal Network Architectures for Automatic Generation of Image Annotation from Text
Mehdi Moradi*; Ali Madani; Yaniv Gur; Yufan Guo; Tanveer Syeda-Mahmood
M-52 Multimodal Recurrent Model with Attention for Automated Radiology Report Generation
Yuan Xue*; Tao Xu; L.Rodney Long; Zhiyun Xue; Sameer Antani; George Thoma; Xiaolei Huang

M-53 Magnetic Resonance Spectroscopy Quantification using Deep Learning
Nima Hatami*; Michael Sdika; Helene Ratiney

M-54 A Lifelong Learning Approach to Brain MR Segmentation Across Scanners and Protocols
Neerav Karani*; Krishna Chaitanya; Christian Baumgartner; Ender Konukoglu

Guannan Zhao; Bo Zhou; Kaiwen Wang; Rui Jiang; Min Xu*

M-56 Generalizability vs. Robustness: Adversarial Examples for Medical Imaging
Magdalini Paschali*; Sailesh Conjeti; Fernando Navarro; Nassir Navab

M-57 Subject2Vec: Generative-Discriminative Approach from a Bag of Image Patches to a Vector
Sumedha Singla; Mingming Gong; Siamak Ravanbakhsh; Frank Sciuра; Barnabas Poczos; Kayhan Batmanghelich*

M-58 3D Context Enhanced Region-based Convolutional Neural Network for End-to-End Lesion Detection
Ke Yan*; Mohammadhadi Bagheri; Ronald Summers

M-59 Keep and Learn: Continual Learning by Constraining the Latent Space for Knowledge Preservation in Neural Networks
Hyo-Eun Kim*; Seung Wook Kim; Jaehwan Lee

M-60 Distribution Matching Losses Can Hallucinate Features in Medical Image Translation
Joseph Paul Cohen*; Margaux Luck; Sina Honari

M-61 Generative Invertible Networks (GIN): Pathophysiology-Interpretable Feature Mapping and Virtual Patient Generation
Jialei Chen*; Yujia Xie; Kan Wang; Zih Huei Wang; Geet Lahoti; Chuck Zhang; Mani Vannan; Ben Wang; Zhen Qian

M-62 Training Medical Image Analysis Systems like Radiologists
Gabriel Maicas*; Andrew Bradley; Jacinto Nascimento; Ian Reid; Gustavo Carneiro

M-63 Joint High-Order Multi-Task Feature Learning to Predict the Progression of Alzheimer’s Disease
Lodewijk Brand; Hua Wang*; Heng Huang; Shannon Risacher; Andrew Saykin; Li Shen
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<tr>
<th>Poster Number</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>M-64</td>
<td>Concurrent Spatial and Channel Squeeze &amp; Excitation in Fully Convolutional Networks</td>
<td>Abhijit Guha Roy*; Nassir Navab; Christian Wachinger</td>
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<td>M-65</td>
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<td>Abhijit Guha Roy*; Sailesh Conjeti; Nassir Navab; Christian Wachinger</td>
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<td>Carolina Pacheco*; Rene Vidal</td>
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<td>Feiyun Zhu*; Jun Guo; Zheng Xu; Peng Liao; Liu Yang; Junzhou Huang</td>
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<td>Moo Chung*; Zhan Luo; Alex Leow; Andrew Alexander; Richard Davidson; Hill Goldsmith</td>
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<td>Tanya Nair; Doina Precup; Douglas Arnold; Tal Arbel*</td>
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<td>Ruobing Huang*; Alison Noble; Ana Ineyda L Namburete</td>
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<td>Saurabh Garg; Suyash P. Awate*</td>
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M-78  On the Effect of Inter-observer Variability for a Reliable Estimation of Uncertainty of Medical Image Segmentation
Alain Jungo*; Raphael Meier; Ekin Ermis; Marcela Blatti-Moreno; Evelyn Herrmann; Roland Wiest; Mauricio Reyes

M-79  Towards Safe Deep Learning: Accurately Quantifying Biomarker Uncertainty in Neural Network Predictions
Zach Eaton-Rosen*; Felix JS Bragman; Sotirios Bisdas; Sebastien Ourselin; M. Jorge Cardoso
**Registration and Image Guidance**

**Chairs:** Parvin Mousavi, Debora Gil

**M-80** Registration-based Patient-specific Musculoskeletal Modeling using High Fidelity Cadaveric Template Model  
Yoshito Otake*; Masaki Takao; Norio Fukuda; Shu Takagi; Naoto Yamamura; Nobuhiko Sugano; Yoshinobu Sato

**M-81** Atlas Propagation through Template Selection  
Hongzhi Wang*; Rui Zhang

**M-82** Spatio-Temporal Atlas of Bone Mineral Density Ageing  
Mohsen Farzi*; Jose M. Pozo; Eugene McCloskey; Richard Eastell; Mark Wilkinson; Alejandro F Frangi

**M-83** Unsupervised Learning for Fast Probabilistic Diffeomorphic Registration  
Adrian V Dalca*; Guha Balakrishnan; John Guttag; Mert Sabuncu

**M-84** Adversarial Similarity Network for Evaluating Image Alignment in Deep Learning based Registration  
Jingfan Fan*; Xiaohuan Cao; Zhong Xue; Pew-Thian Yap; Dinggang Shen

**M-85** Improving Surgical Training Phantoms by Hyperrealism: Deep Unpaired Image-to-Image Translation from Real Surgeries  
Sandy Engelhardt*; Raffale De Simone; Peter M. Full; Matthias Karck; Ivo Wolf

**M-86** Computing CNN Loss and Gradients for Pose Estimation with Riemannian Geometry  
Benjamin Hou*; Nina Miolane; Bishesh Khanal; Matthew Lee; Amir Alansary; Steven McDonagh; Joseph Hajnal; Daniel Rueckert; Ben Glocker; Bernhard Kainz

**M-87** GDL-FIRE4D: General Considerations for Deep Learning-based Fast 4D Image Registration  
Thilo Sentker*; Frederic Madesta; Rene Werner

**M-88** Adversarial Deformation Regularisation for Training Image Registration Neural Networks  
Yipeng Hu*; Eli Gibson; Nooshin Ghavami; Ester Bonmati; Caroline Moore; Mark Emberton; Tom Vercauteren; Alison Noble; Dean Barratt

**M-89** Fast Registration by Boundary Sampling and Linear Programming  
Jan Kybic*; Jiri Borovec
M-90  Learning an Infant Body Model from RGB-D Data for Accurate Full Body Motion Analysis  
Nikolas Hesse*; Sergi Pujades; Javier Romero; Michael J. Black; Christoph Bodensteiner; Michael Arens; Ulrich Hofmann; Uta Tacke; Mijna Hadders-Algra; Raphael Weinberger; Wolfgang Müller-Felber; Sebastian Schroeder

M-91  Consistent Correspondence of Cone-Beam CT Images using Volume Functional Maps  
Yungeng Zhang; Yuru Pei*; Yuke Guo; Gengyu Ma; Tianmin Xu; Hongbin Zha

M-92  Elastic Registration of Geodesic Vascular Graphs  
Stefano Moriconi*; Maria A. Zuluaga; Rolf Jäger; Parashkev Nachev; Sebastien Ourselin; M. Jorge Cardoso

M-93  Efficient Groupwise Registration for MR Brain Images via Hierarchical Graph Set Shrinkage  
Pei Dong; Xiaohuan Cao; Pew-Thian Yap; Dinggang Shen*

M-94  Initialize Globally before Acting Locally: Enabling Landmark-free 3D US to MRI Registration  
Julia Rackerseder*; Maximilian Baust; Ruediger Goebel; Nassir Navab; Christoph Hennersperger

M-95  Solving the Cross-Subject Parcel Matching Problem using Optimal Transport  
Guillermo A Gallardo*; Nathalie Gayraud; Rachid Deriche; Maureen Clerc; Samuel Deslauriers-Gauthier; Demian Wassermann

M-96  GlymphVIS: Visualizing Glymphatic Transport Pathways using Regularized Optimal Transport  
Rena Elkin*; Saad Nadeem; Eldad Haber; Klara Steklova; Hedok Lee; Helene Benveniste; Allen Tannenbaum

M-97  Hierarchical Spherical Deformation for Shape Correspondence  
Ilwoo Lyu*; Martin Styner; Bennett A Landman

M-98  Diffeomorphic Brain Shape Modelling using Gauss-Newton Optimisation  
Yaël Balbastre*; Mikael Brudfors; Kevin Bronik; John Ashburner

M-99  Multi-task SonoEyeNet: Detection of Fetal Standardized Planes Assisted By Generated Sonographer Attention Maps  
Yifan Cai*; Harshita Sharma; Pierre Chatelain; Alison Noble

M-100 Efficient Laplace Approximation for Bayesian Registration Uncertainty Quantification  
Jian Wang*; William Wells; Polina Golland; Miaomiao Zhang
M-101  Uncertainty in Multitask Learning: Joint Representations for Probabilistic MR-only Radiotherapy Planning  
Felix JS Bragman*; Ryutaro Tanno; Zach Eaton-Rosen; Wenqi Li; David Hawkes; Sebastien Ourselin; Daniel Alexander; Jamie R McClelland; M. Jorge Cardoso

M-102  A Combined Simulation & Machine Learning Approach for Image-based Force Classification during Robotized Intravitreal Injections  
Andrea Mendizabal*; Jan Hermann; Tatiana Fountoukidou; Raphael Sznitman; Stephane Cotin

M-103  Learning from Noisy Label Statistics: Detecting High Grade Prostate Cancer in Ultrasound Guided Biopsy  
Shekoofeh Azizi*; Pingkun Yan; Amir Tahmasebi; Peter Pinto; Bradley Wood; Jin Tae Kwak; Sheng Xu; Baris Turkbey; Peter Choyke; Parvin Mousavi; Purang Abolmaesumi

M-104  A Feature-Driven Active Framework for Ultrasound-Based Brain Shift Compensation  
Jie Luo*; Matthew Toews; Ines Machado; Sarah Frisken; Miaomiao Zhang; Frank Preiswerk; Alireza Sedghi; Hongyi Ding; Steve Pieper; Polina Golland; Alexandra Golby; Masashi Sugiyama; William Wells

M-105  Soft-Body Registration of Pre-operative CT to Intra-operative RGBD Partial Body Scans  
Richard Modrzejewski*; Toby Collins; Adrien Bartoli; Alexandre Hostettler; Jacques Marescaux

M-106  Automatic Classification of Cochlear Implant Electrode Cavity Positioning  
Jack Noble*; Robert Labadie; Benoit Dawant

Optical and Histology Applications

Chairs: Yanwu Xu, Jorge Novo Buján

M-107  Instance Segmentation and Tracking with Cosine Embeddings and Recurrent Hourglass Networks  
Christian Payer*; Darko Stern; Thomas Neff; Horst Bischof; Martin Urschler

M-108  Skin Lesion Classification in Dermoscopy Images Using Synergic Deep Learning  
Jianpeng Zhang; Yutong Xie; Qi Wu; Yong Xia*

M-109  SLSDeep: Skin Lesion Segmentation Based on Dilated Residual and Pyramid Pooling Networks  
Md. Mostafa Kamal Sarker*; Hatem A. Rashwan; Farhan Akram; Syeda Furruka Banu; Adel Saleh; Vivek Kumar Singh; Forhad U H Chowdhury; Saddam Abdulwahab; Santiago Romani; Petia Radeva; Domenec Puig

M-110  β-hemolysis Detection on Cultured Blood Agar Plates by Convolutional Neural Networks  
Mattia Savardi; Sergio Benini; Alberto Signoroni*
M-111  A Pixel-wise Distance Regression Approach for Joint Retinal Optical Disc and Fovea Detection
Maria Ines Ferraz Meyer*; Adrian Galdran; Ana Maria Mendonça; Aurélio Campilho

M-112  Deep Random Walk for Drusen Segmentation from Fundus Images
Fang Yan; Jia Cui; Yu Wang; Hong Liu; Hui Liu; Benzheng Wei; Yilong Yin; Yuanjie Zheng*

M-113  Retinal Artery and Vein Classification via Dominant Sets Clustering based Vascular Topology Estimation
Yitian Zhao*; Jianyang Xie; Pan Su; Yalin Zheng; Yonghuai Liu; Jun Cheng; Jiang Liu

M-114  Uniqueness-Driven Saliency Analysis for Automated Lesion Detection with Applications to Retinal Diseases
Yitian Zhao*; Yalin Zheng; Yifan Zhao; Yonghuai Liu; Zhili Chen; Peng Liu; Jiang Liu

M-115  Towards a Glaucoma Risk Index Based on Simulated Hemodynamics from Fundus Images
José Ignacio Orlando; Joao Barbosa Breda*; Karel van Keer; Matthew Blaschko; Pablo J Blanco; Carlos Alberto Bulant

M-116  A Framework for Identifying Diabetic Retinopathy Based on Anti-noise Detection and Attention-based Fusion
Zhiwen Lin; Ruoqian Guo; Yanjie Wang; Bian Wu; Tingting Chen; Wenzhe Wang; Danny Z Chen; Jian Wu*

M-117  Deep Supervision with Additional Labels for Retinal Vessel Segmentation Task
Yishuo Zhang*; Albert Chung

M-118  A Multi-task Network to Detect Junctions in Retinal Vasculature
Fatmatulzehra Uslu*; Anil Anthony Bharath

M-119  A Multi-Task Learning Architecture: Application to Simultaneous Bright and Dark Lesions Segmentation in Color Fundus Images
Clement Playout*; Renaud Duval; Farida Cheriet

M-120  Multiscale Network Followed Network Model for Retinal Vessels Segmentation
Wu YiCheng; Yong Xia*; Yang Song; Yanning Zhang; Weidong Cai

M-121  Predicting Cancer with a Recurrent Visual Attention Model for Histopathology Images
Aicha BeriTaeib*; Ghassan Hamarneh

M-122  A Deep Model with Shape-preserving Loss for Gland Instance Segmentation
Zengqiang Yan*; Xin Yang; Kwang-Ting Cheng
M-123  Model-based Refinement of Nonlinear Registrations in 3D Histology Reconstruction
Juan Eugenio Iglesias*; Marco Lorenzi; Sebastiano Ferraris; Loic Peter; Marc Modat; Allison Stevens; Bruce Fischl; Tom Vercauteren

M-124  Invasive Cancer Detection Utilizing Compressed Convolutional Neural Network and Transfer Learning
Bin Kong*; Shanhui Sun; Xin Wang; Qi Song; Shaoting Zhang

Michael Gadermayr*; Vitus Appel; Barbara Klinkhammer; Peter Boor; Dorit Merhof

M-126  Graph CNN for Survival Analysis on Whole Slide Pathological Images
Ruoyu Li; Jiawen Yao; Xinliang Zhu; Yeqing Li; Junzhou Huang*

M-127  Fully Automated Blind Color Deconvolution of Histopathological Images
Natalia Hidalgo; Javier Mateos*; Miguel Vega; Rafael Molina Soriano; Aggelos Katsaggelos

M-128  Improving Whole Slide Segmentation Through Visual Context-A Systematic Study
Korsuk Sirinukunwattana*; Jens Rittscher; Clare Verrill; Nasullah Khalid Alham

M-129  Adversarial Domain Adaptation for Classification of Prostate Histopathology Whole-Slide Images
Jian Ren*; Ilker Hacihaliloglu; Eric Singer; David Foran; Xin Qi

M-130  Rotation Equivariant CNNs for Digital Pathology
Bastiaan S Veeling*; Jasper Linmans; Jim Winkens; Taco Cohen; Max Welling

M-131  A Probabilistic Model Combining Deep Learning and Multi-atlas Segmentation for Semi-automated Labelling of Histology
Alessia Atzeni*; Marnix Jansen; Sebastien Ourselin; Juan Eugenio Iglesias

M-132  BESNet: Boundary-enhanced Segmentation of Cells in Histopathological Images
Hirohisa Oda*; Holger Roth; Kosuke Chiba; Jure Sokolic; Takayuki Kitasaka; Masahiro Oda; Akinari Hinoki; Hiroo Uchida; Julia A Schnabel; Kensaku Mori

M-133  Panoptic Segmentation with an End-to-end Cell R-CNN for Pathology Image Analysis
Donghao Zhang*; Yang Song; Dongnan Liu; Haozhe Jia; Siqi Liu; Yong Xia; Heng Huang; Weidong Cai

M-134  Integration of Spatial Distribution in Imaging-Genetics
Vaishnavi Subramanian*; Weizhao Tang; Benjamin Chidester; Jian Ma; Minh Do
**M-135**  
Multiple Instance Learning for Heterogeneous Images: Training a CNN for Histopathology  
Heather D Couture*; Steve Marron; Charles Perou; Melissa Troester; Marc Niethammer

**M-136**  
Cell Detection with Star-convex Polygons  
Uwe Schmidt*; Martin Weigert; Coleman W Broaddus; Gene Myers

**M-137**  
Deep Convolutional Gaussian Mixture Model for Stain-Color Normalization of Histopathological Images  
Farhad Ghazvinian Zanjani*; Sveta Zinger; P. H. N. de With

**M-138**  
Learning to Segment 3D Linear Structures Using Only 2D Annotations  
Mateusz Kozinski*; Agata Mosinska; Mathieu Salzmann; Pascal Fua

**M-139**  
A Multiresolution Convolutional Neural Network with Partial Label Training for Annotating Reflectance Confocal Microscopy Images of Skin  
Alican Bozkurt*; Kivanc Kose; Dana Brooks; Jennifer Dy; Milind Rajadhyaksha; Christi Alessi-Fox; Melissa Gill

**M-140**  
A Weakly-Supervised Learning-Based Feature Localization in Confocal Laser Endomicroscopy Glioma Images  
Mohammadhassan Izadyyazdanabadi*; Evgenii Belykh; Claudio Cavallo; Kyle Zhao; Sirin Gandhi; Leandro Moreira; Jennifer Eschbacher; Peter Nakaji; Mark Preul; Yezhou Yang

**M-141**  
Synaptic Partner Prediction from Point Annotations in Insect Brains  
Julia Buhmann*; Renate Krause; Rodrigo Ceballos Lentini; Nils Eckstein; Matthew Cook; Srinivas Turaga; Jan Funke

**M-142**  
Synaptic cleft segmentation in non-isotropic volume electron microscopy of the complete Drosophila brain  
Larissa Heinrich; Jan Funke; Constantin Pape; Juan Nunez-Iglesias; Stephan Saalfeld*

**M-143**  
Weakly Supervised Representation Learning for Endomicroscopy Image Analysis  
Yun Gu*; Khushi Vyas; Jie Yang; Guang-Zhong Yang

**M-144**  
DeepHCS: Bright-field to Fluorescence Microscopy Image Conversion using Deep Learning for Label-free High-Content Screening  
Gyuhyun Lee*; Jeongwoo Oh; Mesun Kang; Namgu Her; Myoung-Hee Kim; Won-Ki Jeong

**M-145**  
A Cascaded Refinement GAN for Phase Contrast Microscopy Image Super Resolution  
Liang Han; Zhaozheng Yin*
M-146 Multi-Context Deep Network for Angle-Closure Glaucoma Screening in Anterior Segment OCT
Huazhu Fu; Yanwu Xu*; Stephen Lin; Damon Wong; Mani Baskaran; Meenakshi Mahesh; Tin Aung; Jiang Liu

M-147 Analysis of Morphological Changes of the Lamina Cribrosa under Acute Intraocular Pressure Change
Mathilde Ravier*; Sungmin Hong; Charly Girot; Hiroshi Ishikawa; Jenna Tauber; Gadi Wollstein; Joel Schuman; James Fishbaugh; Guido Gerig

M-148 Beyond Retinal Layers: A Large Blob Detection for Subretinal Fluid Segmentation in SD-OCT Images
Zexuan Ji*; Qiang Chen; Menglin Wu; Sijie Niu; Wen Fan; Songtao Yuan; Quansen Sun

M-149 Automated Choroidal Neovascularization Detection for Time Series SD-OCT Images
Yuchun Li; Sijie Niu; Zexuan Ji; Wen Fan; Songtao Yuan; Qiang Chen*

M-150 CapsDeMM: Capsule Network for Detection of Munro’s Microabcess in Skin Biopsy Images
Anabik Pal*; Akshay Chaturvedi; Utpal Garain; Aditi Chandra; Raghunath Chatterjee; Swapan Senapati

M-151 Webly Supervised Learning for Skin Lesion Classification
Fernando Navarro*; Sailesh Conjeti; Federico Tombari; Nassir Navab

M-152 Feature Driven Local Cell Graph (FeDeG): Predicting Overall Survival in Early Stage Lung Cancer
Cheng Lu*; Xiangxue Wang; Prateek Prasanna; Geoffrey Sedor; Kaustav Bera; German Corredor; Vamsidhar Velcheti; Anant Madabushi
Tuesday, September 18

11:30-12:30 Poster Session III

Cardiac, Chest and Abdominal Applications

**Chairs:** Andrew King, Pablo Mesejo

T-1 Hashing-Based Atlas Ranking and Selection for Multiple-Atlas Segmentation  
Amin Katouzian*; Hongzhi Wang; Sailesh Conjeti; Hui Tang; Ehsan Dehghan Marvasti;  
Alexandros Karagyris; Anup Pillai; Kenneth Clarkson; Nassir Navab

T-2 Corners detection for bioresorbable vascular scaffolds segmentation in IVOCT images  
Linlin Yao; Yihui Cao*; Qinhua Jin; Jing Jing; Yundai Chen; Jianan Li; Rui Zhu

T-3 Towards Accurate and Complete Registration of Coronary Arteries in CTA images  
Shaowen Zeng*; Jianjiang Feng; Yunqiang An; Bin Lu; Jiwen Lu; Jie Zhou

T-4 Quantifying Tensor Field Similarity with Global Distributions and Optimal Transport  
Arnold Gomez*; Maureen Stone; Philip Bayly; Jerry Prince

T-5 Cardiac Motion Scoring with Segment- and Subject-level Non-Local Modeling  
Wufeng Xue; Gary Brahm; Stephanie Leung; Ogla Shmuilovich; Shuo Li*

T-6 Computational Heart Modeling for Evaluating Efficacy of MRI Techniques in Predicting Appropriate ICD Therapy  
Eranga Ukwatta*; Plaman Nikolov; Natalia A. Trayanova; Graham Wright

T-7 Multiview Two-Task Recursive Attention Model for Left Atrium and Atrial Scars Segmentation  
Jun Chen; Guang Yang; Zhifan Gao; Hao Ni; Elsa Angelini; Tom Wong; Raad Mohiaddin;  
Yanping Zhang; Xiuquan Du; Heye Zhang*; Jennifer Keegan; David Firmin

T-8 Learning Interpretable Anatomical Features Through Deep Generative Models: Application to Cardiac Remodeling  
Carlo Biffi*; Ozan Oktay; Giacomo Tarroni; Wenjia Bai; Antonio De Marvao; Georgia Doumou;  
Martin Rajchl; Reem Bedair; Sanjay Prasad; Stuart Cook; Declan O'Regan; Daniel Rueckert

T-9 Joint Learning of Motion Estimation and Segmentation for Cardiac MR Image Sequences  
Chen Qin*; Wenjia Bai; Jo Schlemper; Steffen Petersen; Stefan Piechnik; Stefan Neubauer;  
Daniel Rueckert
**POSTER SESSIONS**

**T-10** Multi-Input and Dataset-Invariant Adversarial Learning (MDAL) for Left and Right-Ventricular Coverage Estimation in Cardiac MRI
Le Zhang*; Macro Pereanez; Stefan Piechnik; Stefan Neubauer; Steffen Petersen; Alejandro F Frangi

**T-11** Factorised spatial representation learning: application in semi-supervised myocardial segmentation
Agisilaos Chartsias*; Thomas Joyce; Giorgos Papanastasious; Scott Semple; Michelle Williams; David Newby; Rohan Dharmakumar; Sotirios Tsaftaris

**T-12** The Deep Poincaré Map: A Novel Approach for Left Ventricle Segmentation
Yuanhan Mo*; Fangde Liu; Mcilwraith Douglas; Guang Yang; Jingqing Zhang; Taigang He; Yike Guo

**T-13** Bayesian VoxDRN: A Probabilistic Deep Voxelwise Dilated Residual Network for Whole Heart Segmentation from 3D MR Images
Zenglin Shi; Guodong Zeng; Le Zhang; Xiahai Zhuang; Lei Li; Guang Yang; Guoyan Zheng*

**T-14** Real-time Prediction of Segmentation Quality
Robert Robinson*; Ozan Oktay; Wenjia Bai; Vanya Valindria; Mihir Sanghvi; Nay Aung; José Patva; Filip Zemrak; Kenneth Fung; Elena Lukaschuk; Aaron Lee; Valentina Carapella; Young Jin Kim; Bernhard Kainz; Stefan Piechnik; Stefan Neubauer; Steffen Petersen; Chris Page; Daniel Rueckert; Ben Glocker

**T-15** Recurrent Neural Networks for Aortic Image Sequence Segmentation with Sparse Annotations
Wenjia Bai*; Hideaki Suzuki; Chen Qin; Giacomo Tarroni; Ozan Oktay; Paul M. Matthews; Daniel Rueckert

**T-16** Deep Nested Level Sets: Fully Automated Segmentation of Cardiac MR images in Patients with Pulmonary Hypertension
Jinming Duan*; Jo Schlemper; Wenjia Bai; Timothy J W Dawes; Ghalib Bello; Georgia Doumoud; Antonio De Marvao; Declan O’Regan; Daniel Rueckert

**T-17** Atrial Fibrosis Quantification Based on Maximum Likelihood Estimator of Multivariate Images
Fuping Wu; Lei Li; Guang Yang; Tom Wong; Raad Mohiaddin; David Firmin; Jennifer Keegan; Lingchao Xu; Xiahai Zhuang*

**T-18** Left Ventricle Segmentation via Optical-Flow-Net from Short-axis Cine MRI: Preserving the Temporal Coherence of Cardiac Motion
Wenjun Yan*; Yuanyuan Wang; Zeju Li; Rob Van Der Geest; Qian Tao

**T-19** VoxelAtlasGAN: 3D Left Ventricle Segmentation on Echocardiography with Atlas Guided Generation and Voxel-to-voxel Discrimination
Suyu Dong*; Gongming Luo; Kuanquan Wang; Shaodong Cao; Ashley Mercado; Olga Shmuilovich; Henggui Zhang; Shuo Li
T-20  High-dimensional Bayesian Optimization of Personalized Cardiac Model Parameters via an Embedded Generative Model
Jwala Dhamala*; Sandesh Ghimire; John L. Sapp; Bohumil Milan Horacek; Linwei Wang

T-21  Generative Modeling and Inverse Imaging of Cardiac Transmembrane Potential
Sandesh Ghimire*; Jwala Dhamala; Prashnna Kumar Gyawali; John L. Sapp; Bohumil Milan Horacek; Linwei Wang

T-22  Pulmonary Vessel Tree Matching for Quantifying Changes in Vascular Morphology
Zhiwei Zhai*; Marius Staring; Hideki Ota; Berend C Stoel

T-23  MuTGAN: Simultaneous Segmentation and Quantification of Myocardial Infarction without Contrast Agents via Joint Adversarial Learning
Chenchu Xu; Lei Xu; Gary Brahm; Heye Zhang; Shuo Li*

T-24  More Knowledge is Better: Cross-Modality Volume Completion and 3D+2D Segmentation for Intracardiac Echocardiography Contouring
Haofu Liao*; Yucheng Tang; Gareth Funka-Lea; Jiebo Luo; S. Kevin Zhou

T-25  Domain and Geometry Agnostic CNNs for Left Atrium Segmentation in 3D Ultrasound
Markus A Degel*; Nassir Navab; Shadi Albarqouni

T-26  Unsupervised Domain Adaptation for Automatic Estimation of Cardiothoracic Ratio
Nanqing Dong*; Michael C. Kampffmeyer; Xiaodan Liang; Zeya Wang; Wei Dai; Eric P. Xing

T-27  TextRay: Mining Clinical Reports to Gain a Broad Understanding of Chest X-rays
Jonathan Laserson*; Christine Dan Lantsman; Michal Cohen-Sdady; Itamar Tamir; Eli Goz; Chen Brestel; Shir Bar; Maya Atar; Eldad Elnekave

T-28  Localization and Labeling of Posterior Ribs in Chest Radiographs Using a CRF-regularized FCN with Local Refinement
Alexander O Mader*; Jens von Berg; Alexander Fabritz; Cristian Lorenz; Carsten Meyer

T-29  Evaluation of Collimation Prediction Based on Depth Images and Automated Landmark Detection for Routine Clinical Chest X-ray Exams
Julien Sénégas*; Axel Saalbach; Martin Bergtholdt; Sascha Jockel; Detlef Mentrup; Roman Fischbach

T-30  Efficient Active Learning for Image Classification and Segmentation using a Sample Selection and Conditional Generative Adversarial Network
Dwarikanath Mahapatra*; Behzad Bozorgtabar; Jean-Philippe Thiran; Mauricio Reyes
T-31  Iterative Attention Mining for Weakly Supervised Thoracic Disease Pattern Localization in Chest X-Rays  
Jinzheng Cai*; Le Lu; Adam P Harrison; Xiaoshuang Shi; Pingjun Chen; Lin Yang

T-32  Task Driven Generative Modeling for Unsupervised Domain Adaptation: Application to X-ray Image Segmentation  
Yue Zhang*; Shun Miao; Tommaso Mansi; Rui Liao

T-33  Towards Automated Colonoscopy Diagnosis: Binary Polyp Size Estimation via Unsupervised Depth Learning  
Hayato Itoh*; Holger Roth; Le Lu; Masahiro Oda; Masashi Misawa; Yuichi Mori; Shin-ei Kudo; Kensaku Mori

T-34  RIIS-DenseNet: Rotation-Invariant and Image Similarity Constrained Densely Connected Convolutional Network for Polyp Detection  
Yixuan Yuan*; Wenjian Qin; Bulat Ibragimov; Bin Han; Lei Xing

T-35  Interaction Techniques for Immersive CT Colonography: A Professional Assessment  
Daniel S Lopes*; Daniel Medeiros; Soraia Paulo; Pedro Borges; Vitor Nunes; Vasco Mascarenhas; Marcos Veiga; Joaquim Jorge

T-36  Quasi-automatic Colon Segmentation on T2-MRI Images with Low User Effort  
Bernat Orellana*; Eva Monclús; Pere Brunet; Isabel Navazo; Álvaro Bendezú; Fernando Azpiroz

T-37  AutoDVT: Joint Real-time Classification for Vein Compressibility Analysis in Deep Vein Thrombosis Ultrasound Diagnostics  
Ryutaro Tanno; Antonios Makropoulos; Salim Arslan; Ozan Oktay; Sven Mischkewitz; Fouad Al-Noor; Jonas Oppenheimer; Ramin Mandegaran; Bernhard Kainz*; Mattias Heinrich

T-38  Ordinal Multi-Modal Feature Selection for Survival Analysis of Early-stage Renal Cancer  
Wei Shao*; Jun Cheng; Liang Sun; Zhi Han; Daoqiang Zhang; Kun Huang

T-39  Noninvasive Determination of Gene Mutations in Clear Cell Renal Cell Carcinoma using Multiple Instance Decisions Aggregated CNN  
Mohammad Arafat Hussain*; Ghassan Hamarneh; Rafeef Abugharbieh

T-40  Combining Convolutional and Recurrent Neural Networks for Classification of Focal Liver Lesions in Multi-Phase CT Images  
Liang Dong; Lanfen Lin*; Hongjie Hu; Qiaowei Zhang; Qingqing Chen; Yutaro Iwamoto; Xian-Hua Han; Yen-Wei Chen

T-41  Construction of a Spatiotemporal Statistical Shape Model of Pediatric Liver from Cross-sectional Data  
Atsushi Saito*; Koyo Nakayama; Antonio Reyes Porras Perez; Awais Mansoor; Elijah Biggs; Marius Lingurarvu; Akinobu Shimizu
T-42 Deep 3D Dose Analysis for Prediction of Outcomes after Liver Stereotactic Body Radiation Therapy
Bulat Ibragimov*; Diego Toesca; Yixuan Yuan; Albert Koong; Daniel Chang; Lei Xing

T-43 Liver Lesion Detection from Weakly-labeled Multi-phase CT Volumes with a Grouped Single Shot MultiBox Detector
Sang-gil Lee; Jae Seok Bae; Hyunjae Kim; Jung Hoon Kim; Sungroh Yoon*

T-44 A Diagnostic Report Generator from CT Volumes on Liver Tumor with Semi-supervised Attention Mechanism
Jiang Tian*; Cong Li; Zhongchao Shi; Feiyu Xu

T-45 Less is More: Simultaneous View Classification and Landmark Detection for Abdominal Ultrasound Images
Zhoubing Xu*; Yuankai Huo; JinHyeong Park; Bennett A Landman; Andy Milkowski; Sasa Grbic; Shaohua Zhou

T-46 Deep Active Self-paced Learning for Accurate Pulmonary Nodule Segmentation
Wenzhe Wang; Yifei Lu; Bian Wu; Tingting Chen; Danny Z Chen; Jian Wu*

T-47 CT-Realistic Lung Nodule Simulation from 3D Conditional Generative Adversarial Networks for Robust Lung Segmentation
Dakai Jin; Ziyue Xu*; Youbao Tang; Adam P Harrison; Daniel Mollura

T-48 Fast CapsNet for Lung Cancer Screening
Aryan Mobiny; Hien V Nguyen*

T-49 Mean Field Network Based Graph Refinement with Application to Airway Tree Extraction
Raghavendra Selvan*; Max Welling; Jesper Pedersen; Jens Petersen; Marleen de Bruijne

T-50 High Sensitivity with Tiny Candidates for Pulmonary Nodule Detection
Bin Wang; Guo-Jun Qi; Sheng Tang*; Liheng Zhang; Lixi Deng; Yongdong Zhang

T-51 Deep Learning from Label Proportions for Emphysema Quantification
Gerda Bortsova*; Florian Dubost; Silas N Ørting; Ioannis Katramados; Laurens Hogeweg; Laura Thomsen; Mathilde Winkler; Marleen de Bruijne

T-52 Tumor-aware, Adversarial Domain Adaptation from CT to MRI for Lung Cancer Segmentation
Jue Jiang; Yu-Chi Hu; Neelam Tyagi; Pengpeng Zhang; Andreas Rimner; Gig Mageras; Joseph Deasy; Harini Veeraraghavan*

T-53 From Local to Global: A Holistic Lung Graph Model
Yashin Dicente Cid*; Oscar A Jimenez del Toro; Alexandra Platon; Henning Müller; Pierre-Alexandre Poletti
| T-54 | S4ND: Single-shot Single-scale Lung Nodule Detection  
Naji Khosravan*; Ulas Bagci |
| T-55 | Vascular Network Organization via Hough transform (VaNgOGH): A Novel Radiomic Biomarker for Diagnosis and Treatment Response  
Nathaniel Braman*; Prateek Prasanna; Mehdi Alilou; Niha Beig; Anant Madabushi |
| T-56 | DeepEM: Deep 3D ConvNets with EM for Weakly Supervised Pulmonary Nodule Detection  
Wentao Zhu*; Yeeleng Vang; Yufang Huang; Xiaohui Xie |
| T-57 | Statistical Framework for the Definition of Emphysema in CT Scans: Beyond Density Mask  
Gonzalo Vegas Sanchez-Ferrero*; Raul San Jose Estepar |
| T-58 | Conditional Generative Adversarial and Convolutional Networks for X-ray Breast Mass Segmentation and Shape Classification  
Vivek Kumar Singh*; Santiago Romani; Hatem A. Rashwan; Farhan Akram; Nidhi Pandey; Md. Mostafa Kamal Sarker; Saddam Abdulwahab; Jordina Torrents Barrena; Adel Saleh; Miguel Arquez;Meritxell Arenas; Domenec Puig |
| T-59 | A Robust and Effective Approach Towards Accurate Metastasis Detection and pN-stage Classification In Breast Cancer  
Byungjae Lee*; Kyunghyun Paeng |
| T-60 | 3D Anisotropic Hybrid Network: Transferring Convolutional Features from 2D Images to 3D Anisotropic Volumes  
Siqi Liu*; Daguang Xu; S. Kevin Zhou; Olivier Pauly; Sasa Grbic; Thomas Mertelmeier; Julia Wicklein; Anna Jerebko; Weidong Cai; Dorin Comaniciu |
| T-61 | Deep Generative Breast Cancer Screening and Diagnosis  
Shayan Shams*; Richard Platania; Jian Zhang; Joohyun Kim; Kisung Lee; Seung-Jong Park |
| T-62 | Integrate Domain Knowledge in Training CNN for Ultrasonography Breast Cancer Diagnosis  
Jiali Liu; Wanyu Li; Ningbo Zhao; Kunlin Cao; Youbing Yin*; Qi Song; Hanbo Chen; Xuehao Gong |
| T-63 | Small Lesion Classification in Dynamic Contrast Enhancement MRI for Breast Cancer Early Detection  
Hao Zheng*; Yun Gu; Yulei Qin; Xiaolin Huang; Jie Yang; Guang-Zhong Yang |
| T-64 | Thermographic Computational Analyses of a 3D model of a Scanned breast  
Alisson Augusto Azevedo Figureiredo; Gabriela Menegaz; Henrique C Fernandes*; Gilmar Guimarães |
T-65  **Y-Net: Joint Segmentation and Classification for Diagnosis of Breast Biopsy Images**  
Sachin Mehta*; Ezgi Mercan; Jamen Bartlett; Donald Weaver; Joann Elmore; Linda Shapiro

T-66  **MRI Measurement of Placental Perfusion and Fetal Blood Oxygen Saturation in Normal Pregnancy and Placental Insufficiency**  
Rosalind Aughwane*; Magdalena Sokolska; Alan Bainbridge; David Atkinson; Giles Kendall; Jan Deprest; Tom Vercauteren; Anna L. David; Sebastien Ourselin; Andrew Melbourne

T-67  **Automatic Lacunae Localization in Placental Ultrasound Images via Layer Aggregation**  
Huan Qi*; Sally Collins; Alison Noble

T-68  **A Decomposable Model for the Detection of Prostate Cancer in Multi-Parametric MRI**  
Nathan Lay*; Yohannes Tsehay; Yohan Sumathipala; Ruida Cheng; Sonia Gaur; Clayton Smith; Adrian Barbu; Le Lu; Baris Turkbey; Peter Choyke; Peter Pinto; Ronald Summers

T-69  **Direct Automated Quantitative Measurement of Spine via Cascade Amplifier Regression Network**  
Shumao Pang; Stephanie Leung; Ilanit Nachum; Qianjin Feng; Shuo Li*

T-70  **Estimating Achilles Tendon Healing Progress with Convolutional Neural Networks**  
Norbert M Kapinski*; Jakub Zielinski; Bartosz Borucki; Tomasz Trzcinski; Beata Ciszkowska-Lyson; K S Nowinski

**18:15-19:45 Poster Session III**

**fMRI and Diffusion Imaging**

**Chairs:** Ulas Bagci, Carl-Fredrik Westin

T-71  **Multimodal Fusion of Brain Networks with Longitudinal Couplings**  
Wen Zhang*; Kai Shu; Suhang Wang; Huan Liu; Yalin Wang

T-72  **Penalized Geodesic Tractography (GGT) for Mitigating Gyral Bias in Cortical Tractography**  
Ye Wu*; Yuanjing Feng; Dinggang Shen; Pew-Thian Yap

T-73  **A Global Estimation Framework for Asymmetric Fiber Orientation Distributions**  
Ye Wu*; Yuanjing Feng; Dinggang Shen; Pew-Thian Yap
T-74  Anchor-constrained Plausibility (ACP): a Novel Concept for Assessing Tractography and Reducing False-positives
Peter F Neher*; Bram Stieltjes; Klaus H. Maier-Hein

T-75  Tract-Specific Group Analysis in Fetal Cohorts using in Utero Diffusion Tensor Imaging
Shadab Khan*; Caitlin Rollins; Cynthia Ortinau; Onur Afacan; Simon Warfield; Ali Gholipour

T-76  Tract Orientation Mapping for Bundle-specific Tractography
Jakob Wasserthal; Peter F Neher; Klaus H. Maier-Hein*

T-77  Better Fiber ODFs From Suboptimal Data With Autoencoder Based Regularization
Kanil Patel; Samuel Groeschel; Thomas Schultz*

T-78  Identification of Gadolinium Contrast Enhanced Regions in MS lesions using Brain Tissue Microstructure Information Obtained from Diffusion and T2 Relaxometry MRI
Sudhanya Chatterjee*; Olivier Commowick; Onur Afacan; Simon Warfield; Christian Barillot

T-79  A Bayes Hilbert Space for Compartment Model Computing in Diffusion MRI
Aymeric Stamm*; Olivier Commowick; Alessandra Menafoglio; Simon Warfield

T-80  Detection and Delineation of Acute Cerebral Infarct on DWI using Weakly Supervised Machine Learning
Stefano Pedemonte*; Bernardo Bizzo; Stuart Pomerantz; Neil Tenenholtz; Bradley Wright; Mark Walters; Sean Doyle; Adam McCarthy; Renata Rocha De Almeida; Katherine Andriele; Mark Michalski; R. Gilberto Gonzalez

T-81  Identification of Species-Preserved Cortical Landmarks
Tuo Zhang*; Xiao Li; Lin Zhao; Ying Huang; Lei Guo; Tianming Liu

T-82  Deep Learning with Synthetic Diffusion MRI Data for Free-water Elimination in Glioblastoma Cases
Miguel Molina-Romero*; Benedict Wiestler; Pedro Gomez; Marion Menzel; Bjoern Menze

T-83  Enhancing Clinical MRI Perfusion Maps with Data-driven Maps of Complementary Nature for Lesion Outcome Prediction
José Adriano Pinto*; Sérgio Pereira; Raphael Meier; Victor Alves; Roland Wiest; Carlos A. Silva; Mauricio Reyes

T-84  Harmonizing Diffusion MRI Data Across Magnetic Field Strengths
Suheyla Cetin Karayumak*; Marek Kubicki; Yogesh Rathi

T-85  Normative Modeling of Neuroimaging Data using Scalable Multi-Task Gaussian Processes
Seyed Mostafa Kia*; Andre Marquand
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<td>Han Zhang*, Natalie Stanley; Peter Mucha; Weiyan Yin; Weili Lin; Dinggang Shen</td>
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<td>A Riemannian Framework for Longitudinal Analysis of Resting-State</td>
<td>Qingyu Zhao*; Dongjin Kwon; Kilian Pohl</td>
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<td>David Lee*; Joana Louriero; Katherine Narr; Roger Woods; Shantanu Joshi</td>
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<td>Niharika S D’Souza*; Mary Beth Nebel; Nicholas Wymbs; Stewart Mostofsky; Archana Venkataraman</td>
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<td>3D Deep Convolutional Neural Network Revealed the Value of Brain</td>
<td>Yu Zhao*; Fangfei Ge; Shu Zhang; Tianming Liu</td>
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<td>Network Overlap in Differentiating Autism Spectrum Disorder from</td>
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<td>Modeling 4D fMRI Data via Spatio-Temporal Convolutional Neural</td>
<td>Yu Zhao*; Xiang Li; Wei Zhang; Shijie Zhao; Milad Makkie; Mo Zhang; Quanzheng Li; Tianming Liu</td>
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<td>Chao Tang; Yuqing Wei; Jiajia Zhao; Jingxin Nie*</td>
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<td>Jian Cheng*; Tao Liu; Feng Shi; Ruiliang Bai; Jicong Zhang; Haogang Zhu; Dacheng Tao; Peter Basser</td>
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<td>Xiaoxiao Li*; Nicha Dvornek; Juntang Zhuang; Pamela Ventola; James S Duncan</td>
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<td>Hongming Li*; Yong Fan</td>
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<td>Identification of Multi-scale Hierarchical Brain Functional Networks</td>
<td>Hongming Li*; Xiaofeng Zhu; Yong Fan</td>
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<td>T-97</td>
<td>Identification of Temporal Transition of Functional States using</td>
<td>Hongming Li*; Yong Fan</td>
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T-98 Identifying Personalized Autism Related Impairments Using Resting Functional MRI and ADOS Reports
Omar Dekhil; Mohamed Tarek; Ahmed Shalaby; Ali Mahmoud; Andy Switala; Mohammed Ghazal; Hassan Hajjdiab; Begonya Garcia Zapirain; Adel Elmaghraby; Robert Keynton; Gregory Barnes; Ayman S El-Baz*

T-99 Deep Chronnectome Learning via Full Bidirectional Long Short-Term Memory Networks for MCI Diagnosis
Weizheng Yan*; Han Zhang; Jing Sui; Dinggang Shen

T-100 Structured Deep Generative Model of FMRI Signals for Mental Disorder Diagnosis
Takashi Matsubara*; Tetsuo Tashiro; Kuniaki Uehara

T-101 Cardiac Cycle Estimation for BOLD-fMRI
Michael Hutel*; Andrew Melbourne; David Thomas; Sebastien Ourselin

T-102 Neural Activation Estimation in Brain Networks During Task and Rest Using BOLD-fMRI
Michael Hutel*; Andrew Melbourne; Sebastien Ourselin

T-103 Identifying Brain Networks of Multiple Time Scales via Deep Recurrent Neural Network
Yan Cui*; Shijie Zhao; Han Wang; Leo Xie; Yaowu Chen; Junwei Han; Lei Guo; Fan Zhou; Tianming Liu

T-104 A Novel Deep Learning Framework on Brain Functional Networks for Early MCI Diagnosis
Tae-Eui Kam*; Han Zhang; Dinggang Shen

T-105 A Region-of-Interest-Reweight 3D Convolutional Neural Network for the Analytics of Brain Information Processing
Xiuwan Ni*; Zhennan Yan; Tingting Wu; Jin Fan; Chao Chen

T-106 Quantitative Deconvolution of fMRI Data with Multiecho Sparse Paradigm Free Mapping
Cesar Caballero-Gaudes*; Stefano Moia; Peter A. Bandettini; Javier Gonzalez-Castillo

T-107 Probabilistic Source Separation on resting-state fMRI and its Use for Early MCI Identification
Eunsong Kang; Heung-Il Suk*

T-108 Learning Generalizable Recurrent Neural Networks from Small Task-fMRI Datasets
Nicha Dvornek*; Daniel Yang; Pamela Ventola; James S Duncan
T-109  Fast Mapping of the Eloquent Cortex by Learning L2 Penalties  
Nico Hoffmann*; Uwe Petersohn; Gabriele Schackert; Edmund Koch; Stefan Gumhold; Matthias Kirsch

T-110  Combining Multiple Connectomes via Canonical Correlation Analysis Improves Predictive Models  
Siyuan Gao*; Abigail Greene; Todd Constable; Dustin Scheinost

T-111  Exploring Fiber Skeletons via Joint Representation of Functional Networks and Structural Connectivity  
Shu Zhang*; Tianming Liu; Dajiang Zhu

Zachery Morrissey; Liang Zhan; Hyekyoung Lee; Johnson Keiriz; Angus Forbes; Olusola Ajilore; Alex Leow*; Moo Chung

T-113  Edema-informed Anatomically Constrained Particle Filter Tractography  
Samuel Deslauriers-Gauthier*; Drew Parker; Francois Rheault; Rachid Deriche; Steven Brem; Maxime Descoteaux; Ragini Verma

T-114  Thalamic Nuclei Segmentation using Tractography, Population-specific Priors and Local Fibre Orientation  
Carla Semedo*; M. Jorge Cardoso; Sjoerd B. Vos; Carole Sudre; Martina Bocchetta; Annemie Ribbens; Dirk Smeets; Jonathan Rohrer; Sebastien Ourselin

T-115  rfDemons: Resting fMRI-based Cortical Surface Registration using BrainSync Transform  
Anand Joshi*; Jian Li; Minqi Chong; Haleh Akrami; Richard Leahy

Neuroimaging

Chairs: Guido Gerig, Mariano Cabezas

T-116  Using the Anisotropic Laplace Equation to Compute Cortical Thickness  
Anand Joshi*; Chitresh Bhushan; Ronald Salloum; Jessica Wisnowski; David Shattuck; Richard Leahy

T-117  Volume-based Analysis of 6-month-old Infant Brain MRI for Autism Biomarker Identification and Early Diagnosis  
Li Wang*; Gang Li; Feng Shi; Xiaohuan Cao; Chunfeng Lian; Dong Nie; Mingxia Liu; Han Zhang; Guannan Li; Zhengwang Wu; Weili Lin; Dinggang Shen

T-118  A Tetrahedron-based Heat Flux Signature for Cortical Thickness Morphometry Analysis  
Yonghui Fan; Gang Wang; Natasha Lepore; Yalin Wang*
T-119  **Graph of Brain Structures Grading for Early Detection of Alzheimer’s Disease**  
Kilian Hett*; Vinh-Thong Ta; Jose V. Manjon; Pierrick Coupé

T-120  **Joint Prediction and Classification of Brain Image Evolution Trajectories from Baseline Brain Image with Application to Early Dementia**  
Can Gafuroglu; Islem Rekik*

T-121  **Temporal Correlation Structure Learning for MCI Conversion Prediction**  
Xiaoqian Wang; Weidong Cai; Dinggang Shen; Heng Huang*

T-122  **Synthesizing Missing PET from MRI with Cycle-consistent Generative Adversarial Networks for Alzheimer’s Disease Diagnosis**  
Yongsheng Pan*; Mingxia Liu; Chunfeng Lian; Tao Zhou; Yong Xia; Dinggang Shen

T-123  **Exploratory Population Analysis with Unbalanced Optimal Transport**  
Samuel Gerber*; Marc Niethammer; Martin Styner; Stephen R Aylward

T-124  **Multi-Modal Synthesis of ASL-MRI Features with KPLS Regression on Heterogeneous Data**  
Toni Lassila*; Helena Faria; Ali Sarrami-Foroushani; Francesca Meneghello; Annalena Venneri; Alejandro F Frangi

T-125  **A Novel Method for Epileptic Seizure Detection Using Coupled Hidden Markov Models**  
Jeffrey Craley*; Emily Johnson; Archana Venkataraman

T-126  **Deep Convolutional Networks for Automated Detection of Epileptogenic Brain Malformations**  
Ravnoor S Gill*; Seok-Jun Hong; Fatemeh Fadaie; Benoit Caldairou; Boris Bernhardt; Carmen Barba; Armin Brandt; Vanessa Coelho; Ludovico d’Incerti; Matteo Lenge; Mira Semmelroch; Fabrice Bartolomei; Fernando Cendes; Francesco Deleo; Renzo Guerrini; Maxime Guye; Graeme Jackson; Andreas Schulze-Bonhage; Tommaso Mansi; Neda Bernasconi; Andrea Bernasconi

T-127  **Binary Glioma Grading: Radiomics versus Pre-trained CNN Features**  
Milan Decuyper*; Stijn Bonte; Roel Van Holen

T-128  **Automatic Irregular Texture Detection in Brain MRI without Human Supervision**  
Muhammad Febrian Rachmadi*; María del C. Valdés Hernández; Taku Komura

T-129  **Learning Myelin Content in Multiple Sclerosis from Multimodal MRI through Adversarial Training**  
Wen Wei*; Emilie Poirion; Benedetta Bodini; Stanley Durrleman; Nicholas Ayache; Bruno Stankoff; Olivier Colliot

T-130  **Deep Multi-Structural Shape Analysis: Application to Neuroanatomy**  
Benjamin Gutierrez Becker*; Christian Wachinger
T-131 Computational Modelling of Pathogenic Protein Behaviour-governing Mechanisms in the Brain
Konstantinos Georgiadis*; Michael Hutel; Carla Semedo; Adeel Razi; Alexandra Young; Jonathan Schott; Sebastien Ourselin; Jason Warren; Marc Modat

T-132 Generative Discriminative Models for Multivariate Inference and Statistical Mapping in Medical Imaging
Erdem Varol*; Aristeidis Sotiras; Ke Zeng; Christos Davatzikos

T-133 Modeling Longitudinal Voxel-wise Feature Change in Normal Aging with Spatial-Anatomical Regularization
Zhuo Sun; Wei Xu; Shuhao Wang; Junnhai Xu; Yuchuan Qiao*

T-134 Dilatation of Lateral V ventricles with Brain Volumes in Infants with 3D Transfontanelle US
Marc-Antoine Boucher*; Amélie Damphousse; Ramy El-Jalbout; Sarah Lippé; Samuel Kadoury

T-135 Do Baby Brain Cortices that Look Alike at Birth Grow Alike During the First Year of Postnatal Development?
Islem Rekik*; Gang Li; Weili Lin; Dinggang Shen

T-136 Multi-Label Transduction for Identifying Disease Comorbidity Patterns
Ehsan Adeli*; Dongjin Kwon; Kilian Pohl

T-137 Text to Brain: Predicting the Spatial Distribution of Neuroimaging Observations from Text Reports
Jerome Dockes*; Demian Wassermann; Russell Poldrack; Fabian M. Suchanek; Bertrand Thirion; Gael P Varoquaux

T-138 Semi-supervised Learning for Segmentation under Semantic Constraint
Pierre-Antoine Ganaye*; Michael Sdika; Hugues Benoit-Cattin

T-139 Autofocus Layer for Semantic Segmentation
Yao Qin; Konstantinos Kamnitsas; Siddharth Ancha; Jay Nanavati; Garrison Cottrell; Antonio Criminisi; Aditya Nori*

T-140 3D Segmentation with Exponential Logarithmic Loss for Highly Unbalanced Object Sizes
Ken C. L. Wong*; Mehdi Moradi; Hui Tang; Tanveer Syeda-Mahmood

T-141 Revealing Regional Associations of Cortical Folding Alterations with In Utero Ventricular Dilation Using Joint Spectral Embedding
Oualid Benkarim*; Gerard Sanroma; Gemma Piella; Islem Rekik; Nadine Hahner; Elisenda Eixarch; Miguel Angel González Ballester; Dinggang Shen; Gang Li

T-142 CompNet: Complementary Segmentation Network for Brain MRI Extraction
Raunak Dey*; Yi Hong
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<td>Hannah Spitzer*; Kai Kiwitz; Katrin Amunts; Stefan Harmeling; Timo Dickscheid</td>
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<td>Sérgio Pereira*; Victor Alves; Carlos A. Silva</td>
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<td>Weicheng Kuo*; Christian Haene; Esther Yuh; Pratik Mukherjee; Jitendra Malik</td>
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Wednesday, September 19

11:30-12:30 Poster Session V

Computer Assisted Intervention

Chairs: Ingerid Reinertsen, Jon Oñativia

W-1 X-ray-transform Invariant Anatomical Landmark Detection for Pelvic Trauma Surgery
Bastian Bier*; Mathias Unberath; Jan-Nico Zaech; Javad Fotouhi; Mehran Armand; Greg Osgood; Nassir Navab; Andreas K Maier

W-2 Endoscopic Navigation in the Absence of CT Imaging
Ayushi Sinha*; Xingtong Liu; Austin Reiter; Masaru Ishii; Gregory D. Hager; Russell H. Taylor

W-3 A Novel Mixed Reality Navigation for Laparoscopic Surgery
Jayender Jagadeesan*; Brian Xavier; Franklin King; Ahmed Hosny; David Black; Steve Pieper; Ali Tavakkoli

W-4 Respiratory Motion Modelling using cGANs
Alina Giger; Robin Sandkuehler; Christoph Jud*; Grzegorz Bauman; Oliver Bieri; Rares Salomir; Philippe C. Cattin

W-5 Physics-based Simulation to Enable Ultrasound Monitoring of HIFU Ablation: an MRI Validation
Chloé Audigier*; Younsu Kim; Nicholas Ellens; Emad Docter

W-6 DeepDRR-A Catalyst for Machine Learning in Fluoroscopy-guided Procedures
Mathias Unberath*; Jan-Nico Zaech; Sing Chun Lee; Bastian Bier; Javad Fotouhi; Mehran Armand; Nassir Navab

W-7 Exploiting Partial Structural Symmetry for Patient-Specific Image Augmentation in Trauma Interventions
Javad Fotouhi*; Mathias Unberath; Giacomo Taylor; Arash Ghaani Farashahi; Bastian Bier; Russ Taylor; Greg Osgood; Mehran Armand; Nassir Navab

W-8 Intraoperative Brain Shift Compensation using a Hybrid Mixture Model
Siming Bayer*; Nishant Ravikumar; Maddalena Strumia; Xiaoguang Tong; Ying Gao; Martin Ostermeier; Rebecca Fahrig; Andreas K Maier

W-9 Video-based Computer Aided Arthroscopy for Patient Specific Reconstruction of the Anterior Cruciate Ligament
Carolina Raposo*; Cristovao Sousa; Luis Ribeiro; Rui Melo; Joao P. Barreto; Pedro Oliveira; Pedro Marques; Fernando Fonseca
W-10  Simultaneous Segmentation and Classification of Bone Surfaces from Ultrasound Using a Multi-feature Guided CNN
Puyang Wang*; Vishal Patel; Ilker Hacihaliloglu

W-11  Endoscopic Laser Surface Scanner for Minimally Invasive Abdominal Surgeries
Jordan Geurten; Wenyao Xia; Uditha Jarayathne; Terry M. Peters; Elvis Chen*

W-12  Deep Adversarial Context-Aware Landmark Detection for Ultrasound Imaging
Ahmet Tuysuzoglu*; Jeremy Tan; Kareem Eissa; Atilla P. Kiraly; Mamadou Diallo; Ali Kamen

W-13  Towards a Fast and Safe LED-based Photoacoustic Imaging using a Deep Convolutional Neural Networks
Emran Mohammad Abu Anas*; Haichong Kai Zhang; Jin Kang; Emad Docter

W-14  An Open Framework Enabling Electromagnetic Tracking in Image-Guided Interventions
Herman A Jaeger*; Stephen Hinds; Pádraig Cantillon-Murphy

W-15  Colon Shape Estimation Method for Colonoscope Tracking using Recurrent Neural Networks
Masahiro Oda*; Holger Roth; Takayuki Kitasaka; Kazuhiro Furukawa; Ryoji Miyahara; Yoshiki Hirooka; Hidemi Goto; Nassir Navab; Kensaku Mori

Zhongyi Han; Benzheng Wei; Stephanie Leung*; Jonathan Chung; Shuo Li

W-17  A Natural Language Interface for Dissemination of Reproducible Biomedical Data Science
Rogers Jeffrey Leo John*; Jignesh Patel; Andrew Alexander; Vikas Singh; Nagesh Adluru

W-18  Spatiotemporal Manifold Prediction Model for Anterior Vertebral Body Growth Modulation Surgery in Idiopathic Scoliosis
William Mandel; Olivier Turcot; Dejan Knez; Stefan Parent; Samuel Kadoury*

W-19  Evaluating Surgical Skills from Kinematic Data using Convolutional Neural Networks
Hassan Ismail Fawaz*; Germain Forestier; Jonathan Weber; Lhassane Idoumghar; Pierre-Alain Muller

W-20  Needle Tip Force Estimation using an OCT Fiber and a Fused convGRU-CNN Architecture
Nils Gessert*; Torben Priegnitz; Thore Saathoff; Sven-Thomas Antoni; David Meyer; Moritz Franz Hamann; Klaus-Peter Jünemann; Christoph Otte; Alexander Schlaefer
| W-21 | Fast GPU Computation of 3D Isothermal Volumes in the Vicinity of Major Blood Vessels for Cryoablation Simulation  
Ehsan Golkar*; Pramod P. Rao; Leo Joskowicz; Afshin Gangi; Caroline Essert |
| W-22 | A Machine Learning Approach to Predict Instrument Bending in Stereotactic Neurosurgery  
Alejandro Granados*; Matteo Mancini; Sjoerd B. Vos; Oeslle Lucena; Vejay Vakharia; Roman Rodionov; Anna Miserocchi; Andrew W. McEvoy; John Duncan; Rachel Sparks; Sebastien Ourselin |
| W-23 | Deep Reinforcement Learning for Surgical Gesture Segmentation and Classification  
Daochang Liu; Tingting Jiang* |
| W-24 | Automated Performance Assessment in Transoesophageal Echocardiography with Convolutional Neural Networks  
Evangelos B Mazomenos*; Kamakshi Bansal; Bruce Martin; Andrew Smith; Susan Wright; Danail Stoyanov |
| W-25 | DeepPhase: Surgical Phase Recognition in CATARACTS Videos  
Odysseas Zisimopoulos*; Evangello Flouty; Imanol Luengo; Petros Giataganas; Jean Nehme; Andre Chow; Danail Stoyanov |
| W-26 | Surgical Activity Recognition in Robot-Assisted Prostatectomy using Deep Learning  
Aneeq Zia*; Andrew Hung; Irfan Essa; Anthony Jarc |
| W-27 | Unsupervised Learning for Surgical Motion by Learning to Predict the Future  
Robert DiPietro*; Gregory D. Hager |
| W-28 | Volumetric Clipping Surface: Un-occluded visualization of structures preserving depth cues into surrounding organs  
Bhavya Ajani; Aditya Bharadwaj; Karthik Krishnan* |
| W-29 | Closing the Calibration Loop: An Inside-out-tracking Paradigm for Augmented Reality in Orthopedic Surgery  
Jonas Hajek; Mathias Unberath*; Javad Fotouhi; Bastian Bier; Sing Chun Lee; Greg Osgood; Andreas K Maier; Mehran Armand; Nassir Navab |
| W-30 | Higher Order of Motion Magnification for Vessel Localisation in Surgical Video  
Mirek Janatka*; Ashwin Sridhar; John Kelly; Danail Stoyanov |
| W-31 | Simultaneous Surgical Visibility Assessment, Restoration, and Augmented Stereo Surface Reconstruction for Robotic Prostatectomy  
Xiongbiao Luo*; Ying Wan; Hui-Qing Zeng; Yingying Guo; Chidozie Henry Ewurum; Xiao-Bin Zhang; Jonathan McLeod; Terry M. Peters |
W-32  Real-time Augmented Reality for Ear Surgery  
Raabid Hussain*; Alain Lalande; Roberto Marroquin; Kibrom Berihu Girum; Caroline Guigou;  
Alexis Bozorg-Grayeli

W-33  Framework for Fusion of Data- and Model-Based Approaches for Ultrasound Simulation  
Christine Tanner*; Rastislav Starkov; Michael Bajka; Orcun Goksel

Segmentation

Chairs:  Sotirios Tsaftaris, Christian Wachinger

W-34  Bridging the Gap Between 2D and 3D Organ Segmentation with Volumetric Fusion Net  
Yingda Xia; Lingxi Xie*; Fengze Liu; Zhuotun Zhu; Elliot K Fishman; Alan Yuille

W-35  Densely Deep Supervised Networks with Threshold Loss for Cancer Detection in Automated Breast Ultrasound  
Na Wang; Cheng Bian; Yi Wang; Min Xu; Chenchen Qin; Xin Yang; Tianfu Wang; Anhua Li; Dinggang Shen; Dong Ni*

W-36  Pyramid-based Fully Convolutional Networks for Cell Segmentation  
Tianyi Zhao*; Zhaosheng Yin

W-37  Automated Object Tracing for Biomedical Image Segmentation Using a Deep Convolutional Neural Network  
Erica M Rutter*; John Lagergren; Kevin Flores

W-38  RBC Semantic Segmentation for Sickle Cell Disease Based on Deformable U-Net  
Mo Zhang*; Xiang Li; Mengjia Xu; Quanzheng Li

W-39  How to Exploit Weaknesses in Biomedical Challenge Design and Organization  
Annika Reinke*; Matthias Eisenmann; Sinan Onogur; Marko Stankovic; Patrick Scholz;  
Peter Full; Hrvoje Bogunovic; Bennett A Landman; Oskar Maier; Bjoern Menze; Gregory Sharp;  
Korsuk Sirinukunwattana; Stefanie Speidel; Fons van der Sommen; Guoyan Zheng; Henning Müller; Michal Kozubek; Tal Arbel; Andrew Bradley; Pierre Jannin; Anette Kopp-Schneider

W-40  Accurate Detection of Inner Ears in Head CTs Using a Deep Volume-to-Volume Regression Network with False Positive Suppression and a Shape-Based Constraint  
Dongqing Zhang*; Jianing Wang; Jack Noble; Benoit Dawant

W-41  Automatic Teeth Segmentation in Panoramic X-Ray Images Using a Coupled Shape Model in Combination with a Neural Network  
Andreas Wirtz*; Sudesh Ganapati Mirashi; Stefan Wesarg
W-42  Craniomaxillofacial Bony Structures Segmentation from MRI with Deep-Supervision Adversarial Learning
Miaoyun Zhao*; Li Wang; Jiawei Chen; Dong Nie; Yulai Cong; Sahar Ahmad; Angela Ho; Peng Yuan; Steve H. Fung; Hannah H. Deng; James J Xia; Dinggang Shen

W-43  Esophageal Gross Tumor Volume Segmentation using a 3D Convolutional Neural Network
Sahar Yousefi*; Hessam Sokooti; Mohamed El-mahdi; Femke Peters; Mohammad Manzuri Shalmani; Roel Zinkstok; Marius Staring

W-44  Generalizing Deep Models for Ultrasound Image Segmentation
Xin Yang*; Haoran Dou; Ran Li; Xu Wang; Cheng Bian; Shengli Li; Dong Ni; Pheng-Ann Heng

W-45  Deep Learning Based Instance Segmentation in 3D Biomedical Images Using Weak Annotation
Zhuo Zhao*; Lin Yang; Hao Zheng; Ian Guldner; Siyuan Zhang; Danny Z Chen

W-46  Learn the New, Keep the Old: Extending Pretrained Models with New Anatomy and Images
Firat Ozdemir*; Philipp Fürnstahl; Orcun Goksel

W-47  ASDNet: Attention based Semi-supervised Deep Networks for Medical Image Segmentation
Dong Nie*; Yaozong Gao; Li Wang; Dinggang Shen

W-48  MS-Net: Mixed-Supervision Fully-Convolutional Networks for Full-Resolution Segmentation
Meet Shah; Shabbir Merchant; Suyash P. Awate*

W-49  Segmentation of Renal Structures for Image-Guided Surgery
Junning Li*; Pechin Lo; Ahmed Taha; Hang Wu; Tao Zhao

W-50  Kid-Net: Convolution Networks for Kidney Vessels Segmentation from CT-Volumes
Ahmed A Taha*; Pechin Lo; Junning Li; Tao Zhao

W-51  Local and Non-local Deep Feature Fusion for Malignancy Characterization of Hepatocellular Carcinoma
Tianyou Dou; Lijuan Zhang; Hairong Zheng; Wu Zhou*

W-52  AtlasNet: Multi-atlas Non-linear Deep Networks for Medical Image Segmentation
Maria Vakalopoulou*; Guillaume Chassagnon ; Norbert Bus; Rafael Marini-Silva; Evangelia Zacharaki; Marie-Pierre Revel; Nikos Paragios
POSTER SESSIONS

W-53  CFCM: segmentation via Coarse to Fine Context Memory
Fausto Milletari*; Nicola Rieke; Maximilian Baust; Marco Esposito; Nassir Navab

W-54  A Multi-scale Pyramid of 3D Fully Convolutional Networks for Abdominal Multi-organ Segmentation
Holger Roth*; Chen Shen; Hirohisa Oda; Takaaki Sugino; Masahiro Oda; Yuichiro Hayashi; Kazunari Misawa; Kensaku Mori

W-55  3D U-JAPA-Net: Mixture of Convolutional Networks for Abdominal Multi-Organ CT Segmentation
Hideki Kakeya*; Toshiyuki Okada; Yukio Oshiro

W-56  Training Multi-organ Segmentation Networks with Sample Selection by Relaxed Upper Confident Bound
Yan Wang*; Yuyin Zhou; Peng Tang; Wei Shen; Elliot K Fishman; Alan Yuille

W-57  A Novel Bayesian Model Incorporating Deep Neural Network and Statistical Shape Model for Pancreas Segmentation
Jingting Ma*; Feng Lin; Stefan Wesarg; Marius Erdt

W-58  Fine-Grained Segmentation Using Hierarchical Dilated Neural Networks
Sihang Zhou*; Dong Nie; Ehsan Adeli; Yaozong Gao; Li Wang; Jianping Yin; Dinggang Shen

W-59  Inter-site Variability in Prostate Segmentation Accuracy using Deep Learning
Eli Gibson*; Yipeng Hu; Nooshin Ghavami; Hashim Ahmed; Caroline Moore; Mark Emberton; Henkjan Huisman; Dean Barratt

W-60  Deep Learning-based Boundary Detection for Model-based Segmentation with Application to MR Prostate Segmentation
Tom Brosch*; Jochen Peters; Alexandra Groth; Thomas Stehle; Jürgen Weese

W-61  Deep Attentional Features for Prostate Segmentation in Ultrasound
Yi Wang; Zijun Deng; Xiaowei Hu; Lei Zhu*; Xin Yang; Xuemiao Xu; Pheng-Ann Heng; Dong Ni

W-62  Accurate and Robust Segmentation of the Clinical Target Volume for Prostate Brachytherapy
Davood Karimi*; Qi Zeng; Prateek Mathur; Apeksha Avinash; Ingrid Spadinger; Sara Mahdavi; Purang Abolmaesumi; Septimiu Salcudean

W-63  Accurate Weakly-Supervised Deep Lesion Segmentation using Large-Scale Clinical Annotations: Slice-Propagated 3D Mask Generation from 2D RECIST
Jinzheng Cai*; Youbao Tang; Le Lu; Adam P Harrison; Ke Yan; Jing Xiao; Lin Yang; Ronald Summers

W-64  Semi-Automatic RECIST Labeling on CT Scans with Cascaded Convolutional Neural Networks
Youbao Tang*; Adam P Harrison; Mohammadhadi Bagheri; Jing Xiao; Ronald Summers
W-65  Automatic Skin Lesion Segmentation on Dermoscopic Images by the Means of Superpixel Merging  
Diego A Patiño*; Jonathan David Avendano Ortega; John W. Branch Bedoya

W-66  Star Shape Prior in Fully Convolutional Networks for Skin Lesion Segmentation  
Zahra Mirikharaji*; Ghassan Hamarneh

W-67  Btrfly Net: Vertebrae Labelling with Energy-based Adversarial Learning of Local Spine Prior  
Anjany Sekuboyina*; Markus Rempfler; Jan Kukacka; Giles Tetteh; Alexander Valentinitisch; Jan Kirschke; Bjoern Menze

W-68  Fast Vessel Segmentation and Tracking in Ultra High-Frequency Ultrasound Images  
Tejas Sudharshan Mathai*; Lingbo Jin; Vijay Gorantla; John Galeotti

W-69  Deep Reinforcement Learning for Vessel Centerline Tracing in Multi-modality 3D Volumes  
Pengyue Zhang*; Fushen Wang; Yefeng Zheng
16 SEPTEMBER SATELLITE EVENTS OVERVIEW

Satellite Events will take place at Conference Center and Saray Hotel.

- Rooms highlighted in orange are at Saray Hotel

**FULL DAY: 09:30-19:00**
AM: 09:30-13:30
PM: 15:00-19:00

**TUTORIALS**

(T) Deep-A2Z: Tutorial on Deep Learning for Medical Imaging From A(dversarial) to Z(-space) / page: 85
AM-Conference Center-Room B

(T) VisDMML: Blending Visualization with Data Mining and Machine Learning for Biomedical Data Analysis / page: 85
AM-Saray Hotel-Nazari Salon 9

(T) DeepRL: Deep Reinforcement Learning for Medical Imaging / page: 86
PM-Conference Center-Room Machuca

(T) GuidedUS: Hands-on Tutorial on Rapid Prototyping of Ultrasound-guided intervention Systems / page: 87
PM-Conference Center-Seminar Room 6-7

(T) interpretML: Interpretable Machine Learning / page: 87
PM-Conference Center-Room Picasso

PM-Saray Hotel-Nazari Salon 9

PM-Saray Hotel-Mocarabes Salon 6

(T) DL4HIA: Deep Learning for Healthcare Image Analysis / page: 89
PM-Conference Center-Room B
WORKSHOPS

(W) CVII-STENT: Computing and Visualisation for Intravascular Imaging and Computer Assisted Stenting / page: 90
FULL DAY-Conference Center-Salon Abencerrajes-Salon 4

FULL DAY-Conference Center-Room U1

(W) BrainLes-Brain-Lesion workshop: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries + BraTS + ISLES / page: 94
FULL DAY-Conference Center-Room D

(W) PRIME: 1st Workshop on PRedictive Intelligence in Medicine / page: 96
FULL DAY-Saray Hotel-El Partial Salon 10

(W) MLMI-Machine Learning in Medical Imaging 2018 / page: 98
FULL DAY-Conference Center-Manuel de Falla

(W) LABELS: Large-Scale Annotation of Biomedical data and Expert Label Synthesis / page: 98
FULL DAY-Saray Hotel-Sala De La Barca Salon 2

(W) COMPAY: Workshop in Computational Pathology / page: 101
FULL DAY-Conference Center-Room Machado

(W) CBM: MICCAI Workshop on Computational Biomechanics for Medicine XIII / page: 104
FULL DAY-Conference Center-Seminar Room 3-4-5

FULL DAY-Conference Center-Room C

(W) CLIP 2018: 7th MICCAI Workshop on CLinical Image-based Procedures : Translational Research in Medical Imaging / page: 111
FULL DAY-Conference Center-Seminar Room 8

(W) MSKI 2018 + CSI: Computational Methods & Clinical Applications in Musculoskeletal Imaging and for Spine Imaging / page: 114
FULL DAY-Conference Center-Andalucia 1

(W) BIA-Breast Image Analysis / page: 115
AM-Conference Center-Press Room
16 SEPTEMBER SATELLITE EVENTS OVERVIEW

(W) POCUS-Point-of-Care Ultrasound: Algorithms, Hardware, and Applications / page: 116
AM-Conference Center-Seminar Room 6-7

(W) SASHIMI2018: Simulation and Synthesis in Medical Imaging / page: 118
AM-Conference Center-Room Albeniz

(W) SWITCH 2018: Stroke Workshop on Imaging and Treatment Challenges / page: 120
AM-Conference Center-Andalucia 3

(W) PIPPI 2018: Prenatal, Preterm and Paediatric Image analysis / page: 120
AM-Conference Center-Seminar Room 1-2

(W) CereVis 2018: 2018 MICCAI Workshop on Cerebral Imaging Data Visualization / page: 121
AM-Conference Center-Room U1

(W) MLMIR: Machine Learning for Medical Image Reconstruction / page: 123
AM-Conference Center-Picasso

(W) CARE: Computer Assisted and Robotic Endoscopy / page: 125
AM-Saray Hotel-Sala de los Reyes Salon 3

(W) CPM: Computational Precision Medicine 2018 / page: 125
AM-Conference Center-VIP Room

PM-Conference Center-Seminar Room 1-2

(W) OR 2.0: Context-Aware Operating Theaters / page: 127
PM-Conference Center-Press Room

(W) DATRA: Data-driven Treatment Assessment Response / page: 129
PM-Saray Hotel-Sala de los Reyes Salon 3

(W) iMIMIC: Interpretability of Machine Intelligence in Medical Image Computing / page: 130
PM-Conference Center-Room Albeniz

(W) DLF: Deep Learning Fails-page: 131
PM-Conference Center-Andalucia 3
CHALLENGES

(C) EndoVis18: Endoscopic Vision Challenge 2018 + CATARACTS Challenge 2018 / page: 132
FULL DAY-Conference Center-Andalucia 2

(C) ISLES: Ischemic Stroke Lesion Segmentation Challenge / page: 94
FULL DAY: Conference Center-Room D

(C) BraTS: MICCAI Multimodal Brain Tumor Segmentation (BraTS) Benchmark: “Survival Prediction” / page: 94
FULL DAY-Conference Center-Room D

(C) MRBrainS18: MICCAI Grand Challenge on MR Brain Image Segmentation / page: 132
AM-Saray Hotel-Salon Alcazaba Salon 1

(C) IVDM3Seg: Intervertebral Disc Segmentation Challenge 2018 / page: 132
AM-Conference Center-Andalucia 1

(C) CuRIOUS: MICCAI Challenge 2018 for Correction of Brainshift with Intra-Operative UltraSound / page: 133
PM-Saray Hotel-Salon Alcazaba Salon 1

(C) CPM: Computational Precision Medicine Challenge / page: 134
PM-Conference Center-VIP Room
Disclaimer: The daily schedules were prepared by each event's organizers individually. The program below is the most recent version at the time of the publication of this booklet and might have undergone minor revisions since then. The participants are advised to check the website for most recent programs of each event.

## TUTORIALS

**Deep-A2Z: Tutorial on Deep Learning for Medical Imaging From A(dversarials) to Z(-space)**

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<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>09:30</td>
<td>Introduction to deep learning</td>
<td>Geert Litjens, Bram van Ginneken</td>
</tr>
<tr>
<td>10:00</td>
<td>Image segmentation and pixel-wise regression</td>
<td>Jorge Cardoso, Tom Vercauteren</td>
</tr>
<tr>
<td>10:30</td>
<td>Architectures and optimization</td>
<td>Martin Rajchl, Nick Pawlowski, Matt Lee</td>
</tr>
<tr>
<td>11:00</td>
<td>Coffee break</td>
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<tr>
<td>11:30</td>
<td>Adversarial networks</td>
<td>Anirban Mukhopadhyay, Shadi Albarqouni</td>
</tr>
<tr>
<td>12:00</td>
<td>Unsupervised and semi-supervised learning</td>
<td>Konstantinos Kamnitsas</td>
</tr>
<tr>
<td>12:30</td>
<td>Deep learning on graphs</td>
<td>Ira Ktena</td>
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**VisDMML: Blending Visualization with Data Mining and Machine Learning for Biomedical Data Analysis**

<table>
<thead>
<tr>
<th>Time</th>
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<th>Speaker(s)</th>
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<tbody>
<tr>
<td>09:30-09:40</td>
<td>Introduction</td>
<td>Steffen Oeltze-Jafra</td>
</tr>
<tr>
<td>09:40-10:20</td>
<td>Image Analysis Meets Deep Learning and Visualization in Cardiology and Cardiac Surgery</td>
<td>Sandy Engelhardt</td>
</tr>
<tr>
<td>10:20-11:00</td>
<td>Visual Analytics from Feature Design to Deep Neural Networks Understanding</td>
<td>Anna Vilanova, Nicola Pezzotti</td>
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<tr>
<td>11:00-11:30</td>
<td>Coffee Break</td>
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</tbody>
</table>
11:30-12:10  Genes-Structure-Behavior: (Visual) Data Mining and Data Fusion for Neurosciences
Katja Bühler

12:10-12:50  Visual Analytics of Epidemiological Cohort Study Data
Bernhard Preim

Oeltze-Jafra

13:20-13:30  Concluding Remarks, Questions and Discussion
All presenters

DeepRL: Deep Reinforcement Learning for Medical Imaging

15:00-15:30  Introduction to reinforcement learning

15:30-16:00  Review of deep learning

16:00-16:30  Introduction to deep reinforcement learning

16:30-17:00  Coffee break

17:00-17:30  Advances in deep reinforcement learning

17:30-18:00  Surgical robot control via inverse reinforcement learning

18:00-18:30  Artificial agents for detection and registration of 3D images

18:30-19:00  Active learning by reinforcement learning
GuidedUS: Hands-on Tutorial on Rapid Prototyping of Ultrasound-guided intervention Systems

15:00 Welcome and introduction
   Javier Pascau, Gabor Fichtinger

15:05 Keynote: Open-source solutions and desktop 3D printing in clinical surgical applications
   Santiago Ochandiano

15:20 Keynote: Point-of-care ultrasound applications built on open-source software
   Stephen Aylward

15:35 Technical Lecture: Introduction to PLUS and 3D Slicer as an open-source platform for clinical applications
   David García-Mato

16:00 Hands-on tutorial part 1: Software installation, data loading, network configuration
   David García Mato, Mónica García Sevilla, Mark Asselin

16:30 Coffee Break

17:00 Hands-on tutorial part 2: Building a working navigation system; calibrating and integrating a portable tracked ultrasound
   David García Mato, Mónica García Sevilla, Mark Asselin

18:30 Summary and questions

19:00 Adjourn

InterpretML: Interpretable Machine Learning

15:00-15:15 Introduction & Motivation
   Wojciech Samek

15:15-16:30 Techniques for Interpreting Deep Models
   Wojciech Samek

16:30-17:00 Coffee Break

17:00-18:00 Applications of Interpretability
   Wojciech Samek

18:00-19:00 Case Study: Interpretable Machine Learning in Histopathology
   Alexander Binder
### ModelsCDS: Digital Therapy and Patient Models for Clinical Decision Support

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>15:00</td>
<td>Introduction</td>
<td>Steffen Oeltze-Jafra</td>
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<tr>
<td>15:15</td>
<td>Therapy Models for Clinical Decision Support in Laryngeal Cancer Management</td>
<td>Steffen Oeltze-Jafra, Jan Gaebel</td>
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<tr>
<td>16:30</td>
<td>Coffee Break</td>
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<tr>
<td>17:00</td>
<td>Patient Models for Clinical Decision Support in Cerebral Aneurysm Diagnosis and Treatment</td>
<td>Bernhard Preim</td>
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<tr>
<td>18:20</td>
<td>Model Integration</td>
<td>Steffen Oeltze-Jafra</td>
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<tr>
<td>18:40</td>
<td>Concluding Remarks, Questions and Discussion</td>
<td>Steffen Oeltze-Jafra, Bernhard Preim, Jan Gaebel</td>
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<tbody>
<tr>
<td>15:00</td>
<td>Introduction, Goals, Scope</td>
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<tr>
<td>15:10</td>
<td>DICOM: Overview and Historical Perspective</td>
<td>David Clunie</td>
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<tr>
<td>15:40</td>
<td>DICOM for Quantitative Imaging</td>
<td>Andrey Fedorov</td>
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<tr>
<td>16:05</td>
<td>DICOM Data Management Systems</td>
<td>Marco Nolden</td>
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<tr>
<td>16:30</td>
<td>Coffee Break</td>
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<tr>
<td>17:00</td>
<td>Hands-on tutorial prerequisites set-up</td>
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<tr>
<td>17:30</td>
<td>Hands on session: Using DICOM to store your analysis results</td>
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<tr>
<td>18:15</td>
<td>Hands on session: DICOM data wrangling</td>
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</tbody>
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### DL4HIA: Deep Learning for Healthcare Image Analysis

**15:00-16:30**  
**Data Augmentation and Segmentation with Generative Networks for Medical Imaging**  
*Nicola Rieke, Jonny Hancox, Fausto Milletari*

Generative Adversarial Networks (GANs) are pairs of deep neural networks: a generator that creates new examples based on the training data provided and a discriminator that attempts to distinguish between genuine and simulated data. As both networks improve together, the examples created become increasingly realistic. This technology is promising for medical deep learning, because it can augment smaller datasets for training of traditional networks. You’ll learn to:

- Generate synthetic brain MRIs
- Apply GANs for segmentation
- Use GANs for data augmentation to improve accuracy

Upon completion, you’ll be able to apply GANs to medical imaging use cases.

**16:30-17:00**  
**Coffee Break**

**17:00-19:00**  
**Coarse to Fine Contextual Memory for Medical Imaging**

Coarse-to-Fine Context Memory (CFCM) is a technique developed for image segmentation using very deep architectures and incorporating features from many different scales with convolutional Long Short Term Memory (LSTM). In this session, you’ll:

- Take a deep dive into encoder-decoder architectures for medical image segmentation
- Get to know common building blocks (convolutions, pooling layers, residual nets, etc.)
- Investigate different strategies for skip connections

Upon completion, you’ll be able to apply CFCM techniques to medical image segmentation and similar imaging tasks.
WORKSHOPS

CVII-STENT: Computing and Visualisation for Intravascular Imaging and Computer Assisted Stenting

10:00 Welcome
10:30 Invited speaker 1 (Endovascular Interventions at Siemens Healthcare)
   Dr.-Ing Markus Kowarschik and Katharina Breininger, Siemens Healthcare, Germany
11:00-11:30 Coffee Break
11:30 Oral Session 1
13:00 Invited speaker 2
13:30-15:00 Lunch
15:00 Oral Session 2
16:30-17:00 Coffee Break
16:00 Organizer speaker 1
16:30 Organizer speaker 2
17:00 Discussion
   The Future of CVII and Stenting
17:30 Close of Workshop

Oral session 1 (Vascular segmentation and classification)
20 min per person (15 presentation + 5 Q/A)

Sekeun Kim, Yeonggul Jang, Byunghwan Jeon, Youngtaek Hong, Hackjoon Shim and Hyuk-Jae Chang, “Fully automatic segmentation of coronary arteries based on Deep Neural Network in Intravascular Ultrasound Image”

Yihui Cao, Yifeng Lu, Qinhua Jin, Jing Jing, Yundai Chen, Jianan Li and Rui Zhu, “Deep Learning-based Detection and Segmentation for BVS Struts”
Jianning Li, Long Cao, Cheng Wang and Bowen Meng, “Towards Automatic Measurement of Type B Aortic Dissection Parameters : Methods, Applications and Perspective”
Katharina Breininger, Tanja Kurzendorfer, Tobias Würfl, Shadi Albarqouni, Marcus Pfister, Markus Kowarschik, Nassir Navab and Andreas Maier, “Multiple device segmentation for fluoroscopic imaging using multi-task learning”

Miguel Alemán-Flores, Daniel Santana-Cedrés, Luis Alvarez, Agustín Trujillo, Luis Gómez, Pablo G. Tahoces and José M. Carreira, “Segmentation of the Aorta Using Active Contours with Histogram-Based Descriptors”

20 min per person (15 presentation + 5 Q/A)

Oral session 2 (Flow analysis and visualization)
Haidong Hao, Hua Ma and Theo Van Walsum, “Layer Separation in X-ray Angiograms for Vessel Enhancement with Fully Convolutional Network”

Renzo Phellan, Thomas Lindner, Michael Helle, Thiago Spina, Alexandre Falcão and Nils Daniel Forkert, “4D ASL MRA simulated phantoms with added noise learned by using neural styling”
Simon Lessard, Rosalie Plantefève, François Michaud, Catherine Huet, Gilles Soulez and Samuel Kadoury, “Blood-flow estimation in the hepatic arteries based on 3D/2D angiography registration”

Pieter Boonen, Nico Buls, Gert Van Gompel, Yannick De Brucker, Dimitri Aerden, Johan De Mey and Jef Vandemeulebroecke “Automated quantification of blood velocity from time-resolved CT angiography”

## AE-CAI: Augmented Environments for Computer-Assisted Interventions

### 8:00
Registration, Speaker Check-in, and Poster Setup

### 9:30
**Welcome & Opening Remarks**  
*Chair: Cristian A. Linte & Hassan Rivaz*

### 09:40
**Oral Session I: Planning and Visualization in Image-Guided Neurosurgery**  
*Chair: Sandrine de Ribaupierre, Western University*

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:40</td>
<td>Gesture-based registration correction using a mobile augmented reality image-guided neurosurgery system</td>
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<tr>
<td>9:40</td>
<td>Augmented reality guidance in cerebral vascular surgery using microscopic video enhancement</td>
</tr>
<tr>
<td>9:40</td>
<td>Experience-based SEEG planning: from retrospective data to automated electrode trajectories suggestions</td>
</tr>
</tbody>
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### 10:40
**Short Oral Session I**  
*Chair: Ingerid Reinertsen, SINTEF*

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10:40</td>
<td>Comparison of interactive and automatic segmentation of SEEG electrodes on CT postoperative images: preliminary results</td>
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<tr>
<td>10:40</td>
<td>Extending Microsoft’s HoloLens with Optical Tracking for Neuronavigation</td>
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<tr>
<td>10:40</td>
<td>A Multiuser Virtual Reality Environment for Visualizing Neuroimaging Data</td>
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<tr>
<td>10:40</td>
<td>Virtual Interaction and Visualisation of 3D Medical Imaging Data with VTK and Unity</td>
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### 11:00
**Coffee Break**

### 11:30
**Keynote: Klaus Engel**  
*Chair: Hassan Rivaz, Concordia University*

**Title:** Cinematic Rendering-Medical Imaging Goes to the Movies  
*Dr. Klaus Engel*

Principal Key Expert for visualization at Siemens Healthineers, Strategy and Innovation.

### 12:30
**Oral Session II: HMD-based AR**  
*Chair: Caroline Essert, University of Strasbourg*

<table>
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<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>12:30</td>
<td>Endodontic Guided Treatment Using Augmented Reality on a Head-Mounted Display System</td>
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<tr>
<td>12:30</td>
<td>ARssist: Augmented Reality on a Head-Mounted Display for the First Assistant in Robotic Surgery</td>
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</tbody>
</table>
13:10  **Short Oral Session II**  
*Chair: Roy Eagleson, Western University*

- BronchoX: Bronchoscopy Exploration Software for Biopsy Intervention Planning
- Augmented Reality-based Feedback for Technician-in-the-loop C-arm Repositioning
- Augmented reality in computer assisted interventions based on patient-specific 3D printed reference
- Endoscopic Image Enhancement with Noise Suppression

13:30  **Lunch / Poster Session**

15:00  **Keynote: Terry Peters**  
*Chair: Cristian A. Linte, Rochester Institute of Technology*

Title: AR/VR/MR in Medicine-Past, Present, and Future  
*Dr. Terry Peters*

Imaging Research Laboratories  
Robarts Research Institute

16:00  **POSTER SESSION**

16:30  **Coffee Break**

17:00  **Oral Session III: Advanced Intra-operative Guidance and Monitoring**  
*Chair: David R. Holmes III, Mayo Clinic*

- Concepts for Augmented Reality Visualization to support Needle Guidance inside a 3T MRI Scanner
- Augmented reality visualization for orthopedic surgical guidance with pre- and intra-operative multimodal image data fusion
- Fast and accurate vision-based stereo reconstruction and motion estimation for image-guided liver surgery

18:00  **Awards & Closing Remarks**  
*Chairs: Marta Kersten, Cristian A. Linte, Ingerid Reinersten, Hassan Rivaz*
BrainLes-Brain-Lesion workshop: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries + BraTS + ISLES

09:30-11:00  BrainLes Session 1

09:30-09:35  Introduction to the Brain-Lesion (BrainLes) workshop

09:35-10:00  Invited Speaker (Clinical Perspective): ‘Update on Machine Learning in Neuro-Oncology Diagnostics’
Thomas C. Booth, EDiNR DMCC MBBS MA MRCP FRCR Ph.D., King’s College, London, UK

10:00-10:12  “Pathology Segmentation using Distributional Differences to Images of Healthy Origin”
Simon Andermatt, et al.

10:12-10:24  “3D texture feature learning for noninvasive estimation of gliomas pathological subtype”
Guoqing Wu, et al.

10:24-10:36  Deep Autoencoding Models for Unsupervised Anomaly Segmentation in Brain MR Images”
Christoph Baur, et al.

10:36-10:48  “Learning Data Augmentation for Brain Tumor Segmentation with Coarse-to-Fine Generative Adversarial Networks”
Tony C.W. Mok and Albert C.S. Chung

10:48-11:00  “Multi-Institutional Deep Learning Modeling Without Sharing Patient Data: A Feasibility Study on Brain Tumor Segmentation”
Micah J Sheller, et al.

11:00-11:30  Coffee Break

11:30-13:30  BrainLes Session 2
(BraTS Challenge)

11:30-11:35  Overview of the BraTS Challenge & Summary Statistics

11:35-12:00  Invited Speaker (Brain Tumor Segmentation Meta-Analysis): ‘Final summarizing meta-analysis of the BraTS 2012-2016 results’
Bjoern Menze, Ph.D.-Technical University of Munich, Germany

12:00-12:05  Summary Statistics & Ranking Approach
16 SEPTEMBER SATELLITE EVENTS

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>12:05-13:10</td>
<td>Brief oral presentations (i.e. poster-teasers) of BraTS 2018 top-performing methods</td>
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<tr>
<td>13:10-13:30</td>
<td>Final results / Awards / Discussion</td>
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<tr>
<td>13:30-15:00</td>
<td>Lunch Break / Poster session</td>
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<tr>
<td>15:00-16:30</td>
<td>BrainLes Session 3</td>
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<tr>
<td>15:00-15:05</td>
<td>Welcome to the 2nd half of the Brain-Lesion workshop</td>
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<tr>
<td>15:05-15:30</td>
<td>Invited Speaker (Diffusion Imaging): ‘Neurosurgical planning for glioma and TBI, based on diffusion imaging and connectomics’&lt;br&gt;Ragini Verma, Ph.D., University of Pennsylvania, Philadelphia, USA.</td>
</tr>
<tr>
<td>15:30-15:42</td>
<td>“Patient-Specific Registration of Pre-Operative and Post-Recurrence Brain Tumor MRI Scans”&lt;br&gt;Xu Han, et al.</td>
</tr>
<tr>
<td>15:54-16:06</td>
<td>“Multi-Stage Association Analysis of Glioblastoma Gene Expressions with Texture and Spatial Patterns”&lt;br&gt;Samar S. M. Elsheikh, et al.)</td>
</tr>
<tr>
<td>16:06-16:18</td>
<td>“Voxel-wise Comparison with a-contrario Analysis for Automated Segmentation of Multiple Sclerosis Lesions from Multimodal MRI”&lt;br&gt;Francesca Galassi, et al.</td>
</tr>
<tr>
<td>16:30-17:00</td>
<td>Coffee Break</td>
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<tr>
<td>17:00-19:00</td>
<td>BrainLes Session 4 (ISLES Challenge)</td>
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<tr>
<td>17:00-17:05</td>
<td>Overview of the ISLES Challenge &amp; Summary Statistics</td>
</tr>
<tr>
<td>17:05-17:30</td>
<td>Invited Speaker (Optimized 3D Training on Full-Sized MRI Scans) ‘High memory considerations for inference &amp; training deep learning models in medical imaging’&lt;br&gt;G Anthony Reina, M.D., Ph.D., Intel Corporation</td>
</tr>
</tbody>
</table>
16 SEPTEMBER SATELLITE EVENTS

17:30-17:55 Invited Speaker (Clinical Perspective) 'Basics of CT Perfusion'
Arsany Hakim, M.D., University Hospital, Bern, Switzerland

17:55-18:30 Oral presentation of top-performing methods

18:00-19:00 Final results / Awards / Discussion

PRIME: 1st Workshop on PRedictive Intelligence in Medicine

08:00-09:00 Registration

09:00-09:15 Introduction and Welcome

09:15-10:15 Oral Session 1: Disease Diagnosis

O1 (09:15-09:30): Shared latent structures between imaging features and biomarkers in early stages of Alzheimer’s disease

O2 (09:30-09:45): Joint Robust Imputation and Classification for Early Dementia Detection using Incomplete Multi-Modality Data

O3 (09:45-10:00): 3D Convolutional Neural Network and Stacked Bidirectional Recurrent Neural Network for Alzheimer’s Disease Diagnosis

O4 (10:00-10:15): Transfer Learning for Task Adaptation of Brain Lesion Assessment and Prediction of Brain Abnormalities Progression/Regression using Irregularity Age Map in Brain MRI

10:15-11:00 Keynote Speech 1
Speaker: Dr. Ipek Oguz (University of Pennsylvania)

11:00-11:30 Coffee Break

11:30-12:15 Keynote Speech 2
Speaker: Prof. Dinggang Shen (University of North Carolina)

12:15-12:45 Oral Session 2: Generative Adversarial Learning in Medical Imaging

O5 (12:15-12:30): Generation of Amyloid PET Images via Conditional Adversarial Training for Predicting Progression to Alzheimer’s disease

O6 (12:30-12:45): Diffusion MRI Spatial Super-Resolution Using Generative Adversarial Networks

13:00-15:00 Lunch and Poster Session
**P1:** Prediction of severity and treatment outcome for ASD from fMRI

**P2:** Enhancement of Perivascular Spaces using a Very Deep 3D Dense Network

**P3:** Prediction of Hearing Loss Based on Auditory Perception: A Preliminary Study

**P4:** Predicting nucleus basalis of Meynert volume from compartmental brain segmentations

**P5:** Multi-modal Neuroimaging Data Fusion via Latent Space Learning for Alzheimer’s Disease Diagnosis

**P6:** Predicting Emotional Intelligence Scores From Multi-Session Functional Brain Connectomes

**P7:** Towards Continuous Health Diagnosis from Faces with Deep Learning

**P8:** XmoNet: a Fully Convolutional Network for Cross-Modality MR Image Inference

**P9:** Generative Adversarial Training for MRA Image Synthesis Using Multi-Contrast MRI

**P10:** Prediction to Atrial Fibrillation Using Deep Convolutional Neural Networks

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**15:00-15:45**  
**Keynote Speech 3**  
*Speaker: Dr. Ender Konukoglu (ETH Zurich)*

**15:45-16:15**  
**Oral Session 3: Machine Learning for Prediction**

**O7 (15:45-16:00):** Multi-View Brain Network Prediction From a Source View Using Sample Selection via CCA-based Multi-Kernel Connectomic Manifold Learning

**O8 (16:00-16:15):** Computer Aided Identification of Motion Disturbances Related to Parkinson’s Disease

**16:15-16:45**  
**Coffee Break**

**16:45-17:30**  
**Keynote Speech 4**  
*Speaker: Dr. Kilian Pohl (SRI International)*

**17:30-18:00**  
**Oral Session 4: Predictive Modeling**
16 SEPTEMBER SATELLITE EVENTS

O9 (17:30-17:45): Predictive Modeling of Longitudinal Data for Alzheimer’s Disease Diagnosis Using RNNs

O10 (17:45-18:00): Predictive Patient Care: Survival model to prevent Medication Non-adherence

18:00-18:20 NVIDIA Tech Talk

18:20-19:00 Closing Remarks

NVIDIA Best Paper Award
Best Reviewer Acknowledgment

MLMI-Machine Learning in Medical Imaging 2018

The daily program will be announced at the satellite event’s website by organizers.

LABELS: Large-Scale Annotation of Biomedical data and Expert Label Synthesis /

9:30-10:00 Welome and LABELS Review
Raphael Sznitman

10:00-11:00 Oral Presentations:
Chair: Emanuele Trucco

Imperfect Segmentation Labels: How Much Do They Matter?
Nicholas Heller
Joshua Dean, and Nikolaos Papanikolopoulos

Capsule Networks against Medical Imaging Data Challenges
Amelia Jimenez-Sanchez, Shadi Albarqouni, Diana Mateus

Weakly-Supervised Learning for Tool Localization in Laparoscopic Videos
Armine Vardazaryan, Didier Mutter, Jacques Marescaux, Nicolas Padoy

Radiology Objects in COntext (ROCO): A Multimodal Image Dataset
Obioma Pelka, Sven Koitka, Johannes Ruckert, Felix Nensa, Christoph M. Friedrich
Spotlight Presentations:
An Efficient and Comprehensive Labeling Tool for Large-Scale Annotation of Fundus Images
Jaemin Son, Sangkeun Kim, Sang Jun Park, Kyu-Hwan Jung

Crowd disagreement of medical images is informative
Veronika Cheplygina, Josien P. W. Pluim

Generation of a HER2 breast cancer gold-standard using supervised learning from multiple experts
Violeta Chang

Crowdsourcing annotation of surgical instruments in videos of cataract surgery
Tae Soo Kim, Anand Malpani, Austin Reiter, Gregory D. Hager, Shameema Sikder, S. Swaroop Vedula

How can we do better? Pitfalls in biomedical challenge design and how to address them

A tracking-based method for video and volume annotation with sparse point supervision
Laurent Lejeune, Jan Grossrieder, Raphael Sznitman

MelaGo: Gamifying Medical Image Annotation
Vassilis Javed Khan, Pim Meijer, Michele Paludetti, Reka Magyari, Dominique van Berkum, Veronika Cheplygina

Crowdsourcing surgical activity summaries for phase recognition
Anand Malpani, Saranga Arora, S. Swaroop Vedula, Chi Chiung Grace Chen, Gregory D. Hager

11:00-11:30 Coffee Break & Poster Session

11:30-12:30 Keynote Talk: “Quantifying the observer variability in volumetric structure segmentations: a large-scale study and a method”
Leo Joskowicz
### 16 SEPTEMBER SATELLITE EVENTS

**12:30-13:30**  Interactive Session

**13:30-15:00**  Lunch Break

**14:30-15:30**  Keynote Talk: “Challenging Conventional Segmentation Evaluation Metrics in the context of Focal Pathology (e.g. lesion) Segmentation from Patient Images”  
*Tal Arbel*

**16:00-16:30**  Oral Presentations:  
*Chair: Diana Mateus*

- **Feature learning based on visual similarity triplets in medical image analysis: A case study of emphysema in chest CT scans**  
  *Silas Nyboe Ørting, Jens Petersen, Veronika Cheplygina, Laura H. Thomsen, Mathilde M. W. Wille, Marleen de Bruijne*

- **Deep Learning Retinal Vessel Segmentation From a Single Annotated Example: An Application of Cyclic Generative Adversarial Neural Networks**  
  *Praneeth Sadda, John A. Onofrey, Xenophon Papademetris*

- **Spotlight Presentations: Improving out-of-sample prediction of quality of MRIQC**  
  *Oscar Esteban, Russell A. Poldrack, Krzysztof J. Gorgolewski*

- **DeepLesion: a Diverse and Large-scale Database of Significant Radiology Image Findings**  
  *Ke Yan, Xiaosong Wang, Le Lu, Ling Zhang, Mohammadhadi Bagheri, Ronald M. Summers*

- **Generating labels to solve inverse problems in computational biophotonics**  
  *Anant Vemuri, and Lena Mair-Hein*

- **MVOR: A Multi-view RGB-D Operating Room Dataset for 2D and 3D Human Pose Estimation**  
  *Vinkle Srivastav, Thibaut Issenhuth, Abdolrahim Kadkhodamohammadi, Michel de Mathelin, Afshin Gangi, Nicolas Padoy*

**16:30-17:00**  Coffee Break & Poster Session

**17:00-18:45**  Interactive Session

**18:45-19:00**  Award and closing session
## COMPANY: Workshop in Computational Pathology

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<tbody>
<tr>
<td>09:30-10:00</td>
<td><strong>Invited talk: Data variability as a Challenge to improve classification and Retrieval in Digital Pathology</strong>&lt;br&gt;Dr. Manfredo Atzori, University of Applied Sciences Western Switzerland</td>
</tr>
<tr>
<td>10:00-10:20</td>
<td><strong>Leveraging Unlabeled Whole-Slide-Images for Mitosis Detection</strong>&lt;br&gt;Saad Ullah Akram*, University of Oulu, Finland; Talha Qaiser, University of Warwick; Simon Graham, University of Warwick; Juho Kannala, Aalto University, Finland; Janne Heikkila, University of Oulu, Finland; Nasir Rajpoot, University of Warwick</td>
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<tr>
<td>10:20-10:40</td>
<td><strong>Automatic Detection of Tumor Budding in Colorectal Carcinoma with Deep Learning</strong>&lt;br&gt;John-Melle Bokhorst*, Radboud University Medical Center; Francesco Ciompi, Radboud University Medical Center; Jeroen van der Laak, Radboud University Medical Center; Iris Nagtegaal, Radboud UMC; Lucia Rijstenberg, Radboud UMC; Janne Heikkila, University of Oulu, Finland; Nasir Rajpoot, University of Warwick</td>
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<td>10:40-11:00</td>
<td><strong>Improving High Resolution Histology Image Classification with Deep Spatial Fusion Network</strong>&lt;br&gt;Yongxiang Huang*, The Hong Kong University of Science and Technology; Albert Chung, Hong Kong University of Science and Technology</td>
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<tr>
<td>11:00-11:10</td>
<td><strong>Software demo pitches</strong></td>
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<tr>
<td>11:10-11:30</td>
<td><strong>Coffee break</strong></td>
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<tr>
<td>11:30-12:00</td>
<td><strong>Invited talk: AI as an Integrated Tool into a Fully Digital Routine Workflow in a Pathology Department</strong>&lt;br&gt;Dr. Filippo Fraggetta, Cannizzaro Hospital, Italy</td>
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<td>12:00-12:20</td>
<td><strong>Cellular Community Detection for Tissue Classification</strong>&lt;br&gt;Sajid Javed*, University of Warwick; Muhammad Moazam Fraz, University of Warwick; David Epstein, University of Warwick; David Snead, University Hospitals Coventry &amp; Warwickshire NHS Trust; Nasir Rajpoot, University of Warwick</td>
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<tr>
<td>12:20-12:40</td>
<td><strong>Role of Task Complexity and Training in Crowdsourced Image Annotation</strong>&lt;br&gt;Nadine Schaadt*, Hannover Medical School; Anne Grote, Hannover Medical School; Germain Forestier, University of Haute Alsace; Cédric Wemmert, University of Strasbourg; Friedrich Feuerhake, Hannover Medical School</td>
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16 SEPTEMBER SATELLITE EVENTS

12:40-13:00 DeepCerv: Deep Neural Network for Segmentation Free Robust Cervical Cell Classification
Nirmal Jith O U*, AIndra Systems; Harinarayanan K K, Aindra Systems; Srishti Gautam, Indian Institute of Technology Mandi; Arnav Bhavsar, IIT Mandi; Anil Kumar Sao, IIT Mandi

13:00-13:20 Uncertainty Aware Deep Neural Network for Microvessels Segmentation in H&E Stained Histology Images
Muhammad Moazam Fraz*, University of Warwick; Muhammad Shaban, University of Warwick; Simon Graham, University of Warwick; Syed Ali khurram, University of Sheffield; Nasir Rajpoot, University of Warwick

13:20-13:30 Poster Pitches

13:30-15:00 Poster and Software Demo session I / Lunch
Multi-Resolution Networks for Semantic Segmentation in Whole Slide Images
Feng Gu*, ContextVision AB; Nikolay Burlutskiy, ContextVision AB; Mats Andersson, ContextVision AB; Lena Kajland Wilen, ContextVision AB
Structure Instance Segmentation in Renal Tissue: a Case Study on Tubular Immune Cell Detection
Thomas de Bel*, Radboudumc; Jeroen van der Laak, Radboud University Medical Center; Geert Litjens, Radboud Univ. Medical Ctr.; Meyke Hermsen, Radboud University Medical Center
Improving Accuracy of Nuclei Segmentation by Reducing Histological Image Variability
Yusuf Roohani*, Glaxosmithkline; Eric Kiss, Stanford University

Exploiting Multiple Color Representations to Improve Colon Cancer Detection in Whole Slide H&E Stains
Alex Jørgensen*, Aalborg University; Jonas Emborg, Diagnostics & Genomics Group, Dako Denmark A/S, an Agilent Technologies Company; Rasmus Røge, Institute of Pathology, Aalborg University Hospital, Denmark, and the Department of Clinical Medicine, Aalborg University, Denmark; Lasse Østergaard, Aalborg University

Image Magnification Regression Using DenseNet for Exploiting Histopathology Open Access Content
Juan Otálora Montenegro*, HES-SO; Vincent Andrearczyk, HES-SO Valais; Manfredo Atzori, University of Applied Sciences Western Switzerland (HES-SO Valais); Henning Müller, Western Switzerland Sierre

15:30-16:30 Oral session III: Registration and 3D histology imaging
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<tr>
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<tr>
<td>15:00-15:30</td>
<td>Invited talk: Novel Problems and Approaches for Volumetric 3D Pathology</td>
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<td>Mattew Goodman, 3Scan</td>
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<td>15:30-15:50</td>
<td>Modality Conversion from Pathological Image to Ultrasonic Image Using Convolutional Neural Network</td>
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<td>Takashi Ohnishi*, Chiba University; Shu Kashio, Chiba University; Takuya Ogawa, Chiba University; Kazuyu Ito, Chiba University; Stanislav S. Makhanov, School of Information and Computer Technology, Sirindhorn International Institute of Technology, Thammasat University, Thailand; Tadashi Yamaguchi, Chiba University; Yasuo Iwadate, Chiba University; Hideaki Haneishi, Chiba University</td>
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<tr>
<td>15:50-16:10</td>
<td>Accurate 3D Reconstruction of a Whole Pancreatic Cancer Tumor from Pathology Images with Different Stains</td>
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<td>Mauricio Kugler*, Nagoya Institute of Technology; Yushi Goto, Nagoya Institute of Technology; Naoki Kawamura, Nagoya Institute of Technology; Hirokazu Kobayashi, Nagoya Institute of Technology; Tatsuya Yokota, Nagoya Institute of Technology; Chika Iwamoto, Kyushu University; Kenoki Ohuchida, Kyushu University; Makoto Hashizume, Kyushu University; Hidekata Hontani, Nagoya Institute of Technology</td>
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<tr>
<td>16:10-16:30</td>
<td>Whole Slide Image Registration for the Study of Tumor Heterogeneity</td>
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<td>Leslie Solorzano*, Uppsala University; Carolina Wählby, Uppsala University; Carla Oliveira, Universidad do Porto</td>
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<tr>
<td>16:30-16:40</td>
<td>Poster Pitches</td>
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<tr>
<td>16:40-17:00</td>
<td>Coffee break</td>
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<tr>
<td>17:00-18:30</td>
<td>Poster and Software Demo session II</td>
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<td>Evaluating Out-of-the-box Methods for the Classification of Haematopoietic Cells in Images of Stained Bone Marrow</td>
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<td>Philipp Gräbel*, Lehrstuhl für Bildverarbeitung, RWTH Aachen; Barbara Klinkhammer, RWTH Aachen University</td>
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<td></td>
<td>Capturing Global Spatial Context for Accurate Cell Classification in Skin Cancer Histology</td>
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</tbody>
</table>
Significance of Hyperparameter Optimization for Histology Images: A Study for Breast Metastasis Detection
Navid Alemi Koohbanani*, University of Warwick; Talha Qaiser, University of Warwick; Muhammad Shaban, University of Warwick; Nasir Rajpoot, University of Warwick

Construction of a Generative Model of H&E Stained Pathology Images of Pancreas Tumors Conditioned by a Voxel Value of MRI Image
Tomoshige Shimomura*, Nagoya Institute of Technology; Kugler Mauricio, Nagoya Institute of Technology; Tatsuya Yokota, Nagoya Institute of Technology; Chika Iwamoto, Kyushu University; Kenoki Ohuchida, Kyushu University; Makoto Hashizume, Kyushu University, Japan; Hidekata Hontani, Nagoya Institute of Technology

18:30-18:45 Closing remarks and best paper award

CBM: MICCAI Workshop on Computational Biomechanics for Medicine XIII

09:25-09:30 CBM-XIII Opening Remarks

09:30-11:00 CBM-XIII Session 1:

09:30-10:00 Quantitative validation of MRI-based motion estimation for brain impact biomechanics
Arnold D. Gomez, Andrew K. Knutsen, Dzung L. Pham, Philip V. Bayly, Jerry L. Prince

10:00-10:30 Parametric study of lumbar belts in the case of low back pain: effect of patients’ specific characteristics
Rébecca Bonnaire, Woo-Suck Han, Paul Calmels, Reynald Convert, Jérôme Molimard

10:30-11:00 Meshless method for simulation of needle insertion into soft tissues: preliminary results
Adam Wittek, George Bourantas, Grand Roman Joldes, Anton Khau, Konstantinos Mountris, Surya Singh, Karol Miller

11:00-11:30 Coffee Break

11:30-13:30 CBM-XIII Session 2:

11:30-12:30 Biomechanical simulation of vaginal childbirth: the colors of the pelvic floor muscles
Keynote Speaker: Professor Renato M. Natal Jorge
12:30-13:00  Patient-specific modeling of pelvic system from MRI for numerical simulation: validation using a physical model
Zhifan Jiang, Olivier Mayeur, Laurent Patrouix, Delphine Cirette, Jean-François Witz, Julien Dumont, Mathias Brieu

13:00-13:30  A biomechanical study on the use of curved drilling technique for treatment of osteonecrosis of femoral head
Mahsan Bakhtiarinejad, Farshid Alambeigi, Alireza Chamani, Mathias Unberath, Harpal Khanuja, Mehran Armand

13:30-15:00  Lunch / Poster Session

15:00-16:30  CBM-XIII Session 3:

15:00-15:30  Rapid blood flow computation on digital subtraction angiography: preliminary results
George Bourantas, Grand Roman Joldes, Konstantinos Katsanos, George C. Kagadis, Adam Wittek, Karol Miller

15:30-16:00  Removing drift from carotid arterial pulse waveforms: a comparison of motion correction and high-pass filtering
Emily J. Lam Po Tang, Amir HajiRassouliha, Martyn P. Nash, Andrew J. Taberner, Poul M. F. Nielsen, and Yusuf O. Cakmak

16:00-16:30  Muscle excitation estimation in biomechanical simulation using NAF reinforcement learning
Amir H. Abdi, Pramit Saha, Venkata Praneeth Srungarapu, Sidney Fels

16:30-16:35  CBM-XIII Closing Remarks


09:30-9:40  Welcome and agenda (Workshop organizers)

09:40-10:30  Keynote lecture “Machine Learning for Cardiac Imaging”
Dr. Andrew King, King’s College London, UK (Chair: Alistair Young)

10:30-11:00  Regular Papers-poster teasers 2 min each presenter
Chair: Dr. Kawal Rhode

11:00-11:30  Coffee Break
11:30-13:00  Regular Papers-orals  
*Chairs: Dr. Mihaela Pop and Dr. Maxime Sermesant*

11:30-11:42  Estimating Sheets in the Heart Wall  
*T Syed, B Samari, K Siddiqi*

11:42-11:54  Automated Motion Correction and 3D Vessel Centerlines Reconstruction from non- simultaneous angiographic projections*”  
*A Banerjee, R Kharbanda, R Choudhury, V Grau*

11:54-12:06  Left Ventricle Segmentation and Quantification from Cardiac Cine MR Images via Multi-task Learning  
*S Dangi, Z Yaniv, C Linte*

12:06-12:18  Statistical Shape Clustering of Left Atrial Appendages  
*J Slipsager, K Juhl, P Sigvardsen, K Kofoed, O Backer, A Olivares, R Paulsen*

12:18-12:30  Deep Learning Segmentation of the Left Ventricle in Structural CMR  
*S Marquesseau, H Fadil, J Totman*

12:30-12:42  Cine and Multicontrast Late Enhanced MRI Registration for 3D Heart Model Construction  
*F Guo, M Li, M Ng, G Wright, M Pop*

12:42-12:54  Joint analysis of personalized in-silico haemodynamics and shape descriptors of the left atrial appendage  
*J Mill, A Olivares, E Silva, I Genua, A Fernandez, A Aguado, M Nuñez, T Potter, X Freixa, O Camara*

12:54-13:00  Session wrap-up and general discussion

13:00-15:00  Lunch and Poster presentations  
*Chairs: Dr. Kristin McLeod and Dr. Tommaso Mansi)*

15:00-16:30  LV quantification challenge  
*Chair: Dr. Shuo Li*

15:00-15:20  Challenge data and description from the organizers

15:20-16:10  Short orals (10min each) from the LVquant challenge

15:20-15:30  Left-Ventricle Quantification Using Residual U-Net  
*E Kerfoot, J Clough, I Oksuz, J Lee, AP King, J Schnabel*

15:30-15:40  LV full quantification using deep layer aggregation based multitask relationship learning  
*J Li, Z Hu*
15:40-15:50  “Convexity and connectivity principles applied for Left Ventricle segmentation and quantification”  
I Grinias, G Tziritas

15:50-16:00 “Calculation of anatomical and functional metrics using deep learning in Cardiac MRI”  
H Xu, J Schneider, V Grau

16:00-16:10 Automated Full Quantification of Left Ventricle using deep neural networks  
L Liu, J Ma, J Wang, J Xiao

16:10-16:30 Challenge wrap-up

16:30-17:00 Coffee break

17:00-18:50 Atrial segmentation challenge  
Chair: Dr Jichao Zhao)

17:00-17:10 Challenge data and description from the organizers

17:10-18:20 Short orals (10min each) from the 3D Atrial segmentation challenge:

17:10-17:20 Automatic 3D Atrial Segmentation from Gadolinium-enhanced MRI using Volumetric Fully Convolutional Networks  
Q Xia, Y Hao, Z Hu, A Hao

17:20-17:30 Automatically Segmenting the Left Atrium from Cardiac Images Using Successive 3D U-Nets  
S Jia, A Despinasse, Z Wang, H Delingette, X Pennec, P Jais, H Cochet, M Sermesant

17:30-17:40 Fully Automated Left Atrium Cavity Segmentation from 3D GE-MRI by Multi-Atlas Selection and Registration  
M Qiao, Y Wang, R Geest, Q Tao

17:40-17:50 Pyramid Network with online Hard Example Mining for Accurate Left Atrium Segmentation  
C Bian, X Yang, S Zheng, J Ma, YA Liu, R Nezafat, PA Heng, Y Zheng

17:50-18:00 Combating Uncertainty with Novel Losses for Automatic Atrium Segmentation  
X Yang, N Wang, Y Wang, X Wang, R Nezafat, D Ni, PA Heng

18:00-18:10 Attention based hierarchical aggregation network for 3D Left atrial segmentation  
C Li, Q Tong, X Liao, W Si, Y Sun, Q Wang, PA Heng
16 SEPTEMBER SATELLITE EVENTS

18:10-18:30  Challenge wrap-up
18:30-18:50  Presentation from the sponsors
18:50-19:00  Awards, closing remarks and adjourn

List of accepted POSTERS

Regular papers
“How accurate does transesophageal echocardiography identify the mitral valve?”
C Vanelli, W Xia, J Moore, T Peters

“Stochastic Model-Based LV Segmentation in 3D Echocardiography using Fractional Brownian Motion”
O Al-Kadi, A Lu, A Sinusas, J Duncan

“Context Aware 3D Fully Convolutional Networks for Coronary Artery Segmentation”
Y Duan, J Feng, J Lu, J Zhou

“Learning associations between clinical information and motion-based descriptors using a large scale MR-derived cardiac motion atlas”
E Puyol-Anton, B Ruijsink, H Langet, M Craene, P Piro, J Schnabel, A King

“Computational Modelling of Electro-Mechanical Coupling in the Atria and its Changes during Atrial Fibrillation”
S Monaci, D Nordsletten, O Aslanidi

“High Throughput Computation of Reference Ranges of Biventricular Cardiac Function on the UK Biobank Population Cohort”
R Attar, M Pereañez, A Gooya, X Alba, L Zhang, SK Piechnik, S Neubauer, SE Petersen, A Frangi

“Lumen Segmentation of Aortic Dissection with Cascaded Convolutional Network”
Z Li, J Feng, Z Feng, Y An, Y Gao, B Lu, J Zhou

“A Vessel-Focused 3D Convolutional Network for Automatic Segmentation and Classification of Coronary Artery Plaques in Cardiac CTA”
J Liu, C Jin, Y Du, J Feng, J Lu, J Zhou

“Automated image segmentation of the left ventricular mitral valve complex for ischemic mitral regurgitation”

“Atrial scarring segmentation via potential learning in the graph-cut framework”
L Li, G Yang, F Wu, T Wong, R Mohiaddin, D Firmin, J Keegan, L Xu, X Zhuang
“4D cardiac motion modeling using pair-wise mesh registration”
S Yoon, S Baek, D Lee

“ISACHI: Integrated Segmentation and Alignment Correction for Heart Images”
B Villard, E Zacur, V Grau

“3D LV Probabilistic Segmentation in Cardiac MRI using Generative Adversarial Network”
D Yang, L Bo, L Axel, D Metaxas

“A Two-stage U-Net Model for 3D Multi-class Segmentation on Full-resolution Cardiac Data”
C Wang, T MacGillivray, G Macnaught, G Yang, D Newby

“Centreline-based shape descriptors of the left atrial appendage in relation with thrombus formation”
I Genua, A Olivares, E Silva, J Mill, A Fernandez, A Aguado, M Nuñez, T Potter, X Freixa, O Camara

LV Quantification challenge

“ESU-P-Net: Cascading Network for Full Quantification of Left Ventricle from Cine MRI”
W Yan, Y Wang, S Chen, R Geest, Q Tao

“Left Ventricle Full Quantification via Hierarchical Quantification Network”
G Yang, T Hua, C Lu, T Pan, X Yang, L Hu, J Wu, X Zhu, H Shu

“Automatic left ventricle quantification in Cardiac MRI via hierarchical refinement of high-level features by a salient perceptual grouping model”
A Atehortua, M Garreau, D Romo-Bucheli, E Romero

“Cardiac MRI Left Ventricle Segmentation and Quantification: A Framework Combining U-net and Continuous Max-flow”
F Guo, M Ng, G Wright

“Multi-Estimator Full Left Ventricle Quantification through Ensemble Learning”
J Liu, X Li, H Ren, Q Li

“Left ventricle quantification through spatio-temporal CNNs”
A Debus, E Ferrante

“Full Quantification of Left Ventricle using Deep Multitask Network with Combination of 2D and 3D convolution on 2D+t cine MRI”
Y Jang, S Kim, H Shim, HJ Chang

“Left-Ventricle Quantification Using Residual U-Net”
E Kerfoot, J Clough, I Oksuz, J Lee, AP King, J Schnabel
“LV full quantification using deep layer aggregation based multitask relationship learning”
J Li, Z Hu

“Convexity and connectivity principles applied for Left Ventricle segmentation and quantification”
I Grinias, G Tziritas

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H Xu, J Schneider, V Grau

“Automated Full Quantification of Left Ventricle using deep neural networks”
L Liu, J Ma, J Wang, J Xiao

3D atrial segmentation challenge

“Segmentation of the Left Atrium from 3D Gd-Enhanced MRI With Convolutional Neural Networks”
CJ Preetha, S Haridasan, V Abdi, S Engelhardt

“V-FCNN: Volumetric Fully Convolution Neural Network for Automatic Atrial Segmentation”
N Savioli, G Montana, P Lamata

“Ensemble of convolutional neural networks for heart segmentation”
E Fok, J Zhao, J Fernandez

“Multi-Task Learning for Left Atrial Segmentation on GE-MRI”
C Chen, W Bai, D Rueckert

“Left atrial segmentation combining multi-atlas whole heart labeling and shape-based atlas selection”
M Nuñez, X Zhuang, G Sanroma, L Li, L Xu, C Butakoff, O Camara

“Deep Learning Based Method for Left Atrial Segmentation in GE-MRI”
Y Liu, Y Dai, C Yan, K Wang

“Dilated Convolution in Neural Networks for Left Atrial Segmentation in 3D Late Gadolinium Enhanced-MRI”
S Vesal, N Ravikumar, A Maier

“A semantic-wise convolutional neural network approach for 3D left atrium segmentation from LGE-MRI”
D Borra, A Masci, L Esposito, A Andalo, C Fabbri, C Corsi

“Left Atrial Segmentation in a Few Seconds Using Fully Convolutional Network and Transfer Learning”
E Puybareau, Z Zhou, Y Khoudli, Y Xu, J Lacotte, T Géraud
“Convolutional Neural Networks for Segmentation of the Left Atrium from Gadolinium-Enhancement MR Images”
C Vente, M Veta, O Razeghi, S Niederer, J Pluim, K Rhode, R Karim

“Mixture Modeling of Global Shape Priors and Autoencoding Local Intensity Priors for Left Atrium Segmentation”
T Sodergren, R Bhalodia, R Whitaker, J Cates, N Marrouche, S Elhabian

“Automatic 3D Atrial Segmentation from Gadolinium-enhanced MRI using Volumetric Fully Convolutional Networks”
Q Xia, Y Hao, Z Hu, A Hao

“Automatically Segmenting the Left Atrium from Cardiac Images Using Successive 3D U-Nets”
S Jia, A Despinasse, Z Wang, H Delingette, X Pennec, P Jais, H Cochet, M Sermesant

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“Attention based hierarchical aggregation network for 3D Left atrial segmentation”
C Li, Q Tong, X Liao, W Si, Y Sun, Q Wang, PA Heng

CLIP 2018: 7th MICCAI Workshop on CLinical Image-based Procedures: Translational Research in Medical Imaging

08:30-09:30 Registration
09:30-09:40 Opening remarks
09:40-10:40 Keynote lecture (I)
“From academia to entrepreneurship: my personal story”
Vesna Prchovska, PhD, Chief Operating Officer, QMENTA (Barcelona, Spain and Boston, USA)
10:40-11:00 Oral presentations (I)

“Patch-based image similarity for intraoperative 2D/3D pelvis registration during periacetabular osteotomy”
Robert B. Grupp¹, Mehran Armand²,³, and Russell H. Taylor¹
¹ Johns Hopkins University, Department of Computer Science, Baltimore, MD, USA; ² Johns Hopkins University, Department of Mechanical Engineering, Baltimore, MD, USA; ³ Johns Hopkins Applied Physics Laboratory, Laurel, MD, USA

11:00-11:40 Coffee break

11:40-13:20 Oral presentations (II)

“Clinical implementation of DeepVoxNet for auto-delineation of organs at risk in head and neck cancer patients in radiotherapy”
Siri Willems¹, Wouter Crijns³, Agustina La Greca Saint-Esteven¹, Julie Van Der Veen¹, David Robben¹, Tom Depuydt²,³, Sandra Nuyts²,³, Karin Haustermans²,³, and Frederik Maes¹
¹ Medical Image Computing (ESAT/PSI), KU Leuven, Belgium; ² KU Leuven – University of Leuven, Department of Oncology, Laboratory of Experimental Radiotherapy, Leuven, Belgium; ³ University Hospitals Leuven, Department of Radiation Oncology, Leuven, Belgium

“Preoperative planning and simulation framework for twin-to-twin transfusion syndrome fetal surgery”
Jordina Torrents-Barrena¹, Rocío López-Velazco¹, Narcís Masoller², Brenda Valenzuela-Alcaraz², Eduard Gratacós², Elisenda Eixarch², Mario Ceresa¹, Miguel A. González Ballester¹,²
¹ BCN MedTech, Universitat Pompeu Fabra, Barcelona, Spain; ² Fetal i+D Medicine Research Center, BCNatal-Center for Maternal-Fetal and Neonatal Medicine (Hospital Clinic and Hospital Sant Joan de Déu), Institut Clinic de Ginecologia, Obstetricia i Neonatologia, Institut d’Investigacions Biomèdiques August Pi i Sunyer, Universitat de Barcelona, and CIBER-ER, Barcelona, Spain; ³ ICREA, Barcelona, Spain

“Fully-automated analysis of body composition from CT in cancer patients using convolutional neural networks”
Christopher P. Bridge¹, Michael Rosenthal², Bradley Wright¹, Gopal Kotecha¹, Florian Fintelmann¹, Fabian Troschel³, Nityanand Miskin², Khanant Desai², William Wrobel², Ana Babic¹, Natalia Khalaf², Lauren Braits², Marisa Welch⁴, Caitlin Zellers⁴, Neil Tenenholtz¹, Mark Michalski¹, Brian Wolpin⁴, Katherine Andriole¹
¹ MGH and BWH Center for Clinical Data Science, Boston, USA; ² Brigham and Women’s Hospital, Boston, USA; ³ Massachusetts General Hospital, Boston, USA; ⁴ Dana-Farber Cancer Institute, Boston, USA
“Image-based bronchial anatomy codification for biopsy guiding in video bronchoscopy”
Esmitt Ramirez¹, Carles Sanchez¹, Agnes Borràs¹, Marta Diez-Ferrer², Antoni Rosell², Debora Gil¹,³
¹ Computer Vision Center, Autonomous University of Barcelona, Spain; ² Bellvitge University Hospital, L’Hospitalet de Llobregat, Spain; ³ Serra Hun̵ter Fellow, Spain

“Automatic teeth segmentation in cephalometric X-ray images using a coupled shape model”
Andreas Wirtz¹,², Johannes Wambach¹, Stefan Wesarg¹,²
¹ Fraunhofer IGD, Darmstadt, Germany; ² TU Darmstadt, Interactive Graphics Systems Group, Darmstadt, Germany

13:30-15:00  Lunch

15:00-15:45  Keynote lecture (II) (co-located with RAMBO workshop)
“Advanced imaging and image analysis in fetal medicine”
Elisenda Eixarch, MD, PhD, Fetal and Perinatal Medicine Research Group, IDIBAPS, Hospital Clinic of Barcelona, Spain

15:45-16:30  Keynote (III) (co-located with RAMBO workshop)
“Personalized blood flow simulation from an image-derived model: changing the paradigm for cardiovascular diagnostics”
Leo Grady, PhD, Senior Vice President of Engineering, Heartflow, Redwood City, CA, USA

16:30-17:00  Coffee break

17:00-17:40  Oral presentations (III)-2 talks (x20min)
“A mixed reality guidance system for robot assisted laparoscopic radical prostatectomy”
Abhishek Kolagunda¹, Scott Sorensen¹, Sherif Mehralivand², Philip Saponaro¹, Wayne Treible¹, Baris Turkbey², Peter Pinto², Peter Choyke², Chandra Kambhamettu¹
¹ University of Delaware; ² National Institute of Health

“Fusion of microelectrode neuronal recordings and MRI landmarks for automatic atlas fitting in deep brain stimulation surgery”
Eduard Bakstein¹,², Tomás Sieger¹,³, Filip Ruzicka², Daniel Novák¹, Robert Jech³
¹ Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague; ² National Institute of Mental Health, Kladany, Czech Republic; ³ Department of Neurology and Center of Clinical Neuroscience, First Faculty of Medicine, Charles University, and General University Hospital, Prague, Czech Republic

17:40-17:55  Closing remarks
MSKI 2018 + CSI: Computational Methods & Clinical Applications in Musculoskeletal Imaging and for Spine Imaging

09:30-10:00  Computer-Based Diagnosis of Sacroiliitis in CT Scans: Method and Preliminary Results
Prof. Leo Joskowicz, Head, Computer-Assisted Surgery and Medical Image Processing Laboratory School of Computer Science and Engineering
The Edmond and Lily Safra Center for Brain Sciences-ELSC The Hebrew University of Jerusalem

10:00-10:15  Oral 1 - Spinal Cord Gray Matter-White Matter Segmentation on Magnetic Resonance AMIRA Images with MD-GRU
Antal Horváth (University of Basel); Charidimos Tsagkas (University Hospital Basel); Simon Andermatt (Center for medical Image Analysis and Navigation); Simon Pezold (MIAC, University of Basel, CH); Katrin Parmar (University Hospital Basel); Philippe C. Cattin (University of Basel)

10:15-10:30  Oral 2 - Predicting Scoliosis in DXA Scans Using Intermediate Representations
Amir Jamaludin (University of Oxford); Timor Kadir (Optellum); Emma Clark (University of Bristol); Andrew Zisserman (University of Oxford)

10:30-10:45  Oral 3 - Fast Registration of CT with Intra-Operative Ultrasound Images for Spine Surgery
Houssem-Eddine Gueziri (McGill University); Louis Collins (McGill)

10:45-11:00  Oral 4 - Towards a Deformable Multi-Surface Approach to Ligamentous Spine Models for Predictive Simulation-Based Scoliosis Surgery Planning
Michel Audette (Old Dominion University)

11:00-11:30  Coffee Break

11:30-11:45  Oral 5 - Error Estimation for Appearance Model Segmentation of Musculoskeletal Structures using Multiple, Independent Sub-models
Paul A Bromiley (University of Manchester); Eleni Kariki (Manchester University Hospitals NHS Foundation Trust); Timothy Cootes (University of Manchester)

12:45-12:00  Oral 6 - Automated Segmentation of Intervertebral Disc using Fully Dilated Separable Deep Neural Networks
Huan Wang (University of Electronic Science and Technology of China); Ran Gu (University of Electronic Science and Technology of China); Zhongyu Li (University of North Carolina at Charlotte)

12:00-12:15  Oral 7 - Intensity Standardization of Skeleton in Follow-up Whole-Body MRI
Jakub Ceranka (Vrije Universiteit Brussel)

12:15-12:30  Oral 8 - Automated Grading of Modic Changes using CNNs – Improving the Performance with Mix-up
Dimitrios Damopoulos (Institute for Surgical Technology and Biomechanics); Daniel Haschtmann (Schulthess Clinic); Tamás Fekete (Schulthess Clinic); Guoyan Zheng (University of Bern)

12:30-13:10  Short Presentations of ivdm3seg Segmentation Challenge

13:10-13:30  Best Paper Announcement
BIA-Breast Image Analysis

09:45 10:30  Opening Remarks
Invited Talk by Orcun Goksel
Ultrasound: An age-old ingredient, for new recipes in medical imaging

10:30-11:00  Spotlight Presentations
Siamese Network for Dual-View Mammography
Mass Matching
Shaked Perek, Alon Hazan, Ella Barkan, Ayelet Akselrod-Ballin

Large-scale mammography CAD with Deformable Conv-Nets
Stephen Morrell, Zbigniew Wojna, Can Son Khoo, Sebastien Ourselin, Juan Eugenio Iglesias

Domain Adaptation for Deviating Acquisition Protocols in CNN-based Lesion Classification on Diffusion-Weighted MR Images
Jennifer Kamphenkel, Paul F. Jager, Sebastian Bickelhaupt, Frederik Bernd Laun, Wolfgang Lederer, Heidi Daniel, Tristan Anselm Kuder, Stefan Delorme, Heinz-Peter Schlemmer, Franziska Konig, Klaus H. Maier-Hein

Reproducible evaluation of registration algorithms for movement correction in dynamic contrast enhancing magnetic resonance imaging for breast cancer diagnosis
I. A. Illan, J. Ramirez, J. M. Gorriz, K. Pinker, A. Meyer-Baese

Improved Breast Mass Segmentation in Mammograms with Conditional Residual U-net
Heyi Li, Dongdong Chen, William H. Nailon, Mike E. Davies, David Laurenson

Improving Breast Cancer Detection using Symmetry Information with Deep Learning
Yeman Brhane Hagos, Albert Gubern Merida, Jonas Teuwen

Conditional Infilling GANs for Data Augmentation in Mammogram Classification
Eric Wu, Kevin Wu, David Cox, William Lotter

A Unified Mammogram Analysis Method via Hybrid Deep Supervision
Rongzhao Zhang, Han Zhang, Albert C.S. Chung

Structure-aware Staging for Breast Cancer Metastases
Songtao Zhang, Li Sun, Ruiqiao Wang, Hongping Tang, Jin Zhang, Lin Luo

11:00-11:30  Poster Presentations + Coffee Break
### 16 SEPTEMBER SATELLITE EVENTS

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<th>Event</th>
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<td>11:30-12:15</td>
<td>Computer-aided detection and diagnosis of breast cancer with MRI</td>
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<td><em>Invited Talk by Anne Martel</em></td>
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<td>12:15-13:00</td>
<td>Practical machine intelligence-Collaboration, explainability, and ethics</td>
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<td><em>Invited Talk by Markus Wenzel</em></td>
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<td>13:00-13:10</td>
<td>Best Paper Award Ceremony and Closing Remarks</td>
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<td>13:10-13:30</td>
<td>Poster Presentations</td>
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#### POCUS-Point-of-Care Ultrasound: Algorithms, Hardware, and Applications

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<th>Time</th>
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<tr>
<td>09:30-09:40</td>
<td>Welcome and Workshop Goals</td>
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<td><em>Stephen R. Aylward, Kitware, USA</em></td>
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<td>Oral Presentations</td>
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<td>09:40-10:00</td>
<td>Robust Photoacoustic Beamforming using Dense Convolutional Neural Networks</td>
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<td><em>Emran Mohammad Abu Anas, Haichong K. Zhang, Chloe Audigier, Emad M. Boctor</em></td>
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<td><em>Johns Hopkins University, USA</em></td>
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<td>10:00-10:20</td>
<td>GLUENet: Ultrasound Elastography Using Convolutional Neural Network</td>
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<td><em>Golam Kibria and Hassan Rivaz, Concordia University and PERFORM Centre, Canada</em></td>
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<td>10:20-11:00</td>
<td>A Training Tool for Ultrasound-guided Central Line Insertion with Webcam-based Position Tracking</td>
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<td><em>Mark Asselin, Tamas Ungi, Andras Lasso and Gabor Fichtinger, Queen’s University, Canada</em></td>
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<tr>
<td>11:00-11:30</td>
<td>Break</td>
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</table>
11:30-11:50  Quality Assessment of Fetal Head Ultrasound Images Based on Faster R-CNN  
Zehui Lin, Minh Hung Le, Dong Ni, Siping Chen, Shengli Li, Tianfu Wang, and Baiying Lei  
Shenzhen University and Shenzhen Maternal and Child Healthcare Hospital, China

11:50-12:10  Recent Advances in Point-of-Care Ultrasound using Real-Time Image Analysis  
Oliver Zettinig, Mehrdad Salehi, Raphael Prevost, and Wolfgang Wein  
ImFusion GmbH and Technische Universitat Munchen, Germany

Live Demonstrations

12:10-12:30  Lightning Introductions to Live Demonstrations

12:30-13:25  Live Demonstrations

Fusing Hololens and Point-Of-Care Ultrasound Technology for Intuitive Procedure Guidance  
Luv Kohli  
InnerOptic, USA

Markerless Inside-Out Tracking for 3D Ultrasound Compounding  
Benjamin Busam, Patrick Ruhkamp, Salvatore Virga, Beatrice Lentes,  
Nassir Navab, Christoph Hennersperger  
Technische Universitat Munchen and FRAMOS GmbH, Germany; and JHU, USA

Ultrasound-Base Detection of Lung Abnormalities in Ultrasound Imagery using Single Shot Deep Convolutional Networks  
Sourabhdh Kulhare, Xinliang Zheng, Courosh Mehanian, Cynthia Gregory, Meihua Zhu, Kenton Gregory, Hua Xie, James McAndrew Jones, Benjamin Wilson  
Intellectual Ventures Laboratory, USA and Oregon Health Sciences University, USA

Quantitative Echocardiography: Real-time Quality Estimation and View Classification Implemented on a Mobile Android Device  
Nathan Van Woudenberg, Zhibin Liao, Amir H. Abdì, Hani Girgis, Christina Luong, Hooman Vaseli, Haotian Zhang, Kenneth Gin, Robert Rohling, Teresa Tsang, and Purang Abolmaesumi, University of British Columbia and Vancouver General Hospital, Canada

Single-Element Needle-Based Ultrasound Imaging of Spine: An In Vivo Feasibility Study  
Haichong K. Zhang, Younsu Kim, Abhay Moghekar, Nicholas J. Durr, and Emad M. Boctor, Johns Hopkins University, USA
A Training Tool for Ultrasound-guided Central Line Insertion with Webcam-based Position Tracking
Mark Asselin, Tamas Ungi, Andras Lasso and Gabor Fichtinger
Queen’s University, Canada

Quality Assessment of Fetal Head Ultrasound Images Based on Faster R-CNN
Zehui Lin, Minh Hung Le, Dong Ni, Siping Chen, Shengli Li, Tianfu Wang, and Baiying Lei
Shenzhen University and Shenzhen Maternal and Child Healthcare Hospital, China

Recent Advances in Point-of-Care Ultrasound using Real-Time Image Analysis
Oliver Zettinig, Mehrdad Salehi, Raphael Prevost, and Wolfgang Wein
ImFusion GmbH and Technische Universität München, Germany

13:25-13:30 Closing Remarks

SASHIMI2018: Simulation and Synthesis in Medical Imaging

09:30-09:35 Opening remarks

09:35-11:05 Oral Session

09:35-09:50 Model-Based Generation of Synthetic 3D Time-Lapse Sequences of Multiple Mutually Interacting Motile Cells with Filopodia
Igor Peterlik, David Svoboda, Vladimír Ulman, Dmitry Sorokin, Martin Maška

09:50-10:05 Deep Harmonization of Inconsistent MR Data for Consistent Volume Segmentation
Blake Dewey, Can Zhao, Aaron Carass, Jiwon Oh, Peter Calabresi, Peter van Zijl, Jerry Prince

10:05-10:20 Deep Boosted Regression for MR to CT Synthesis
Kerstin Klaser, Pawel Markiewicz, Marta Bianca Maria Ranzini, Wenqi Li, Marc Modat, Brian Hutton, David Atkinson, Kris Thielemans, Jorge Cardoso, Sebastien Ourselin

10:20-10:35 Unsupervised learning for cross-domain medical image synthesis using deformation invariant cycle consistency networks
Chengjia Wang, Gillian Macnaught, Georgios Papanastasiou, Tom MacGillivray, David Newby
10:35-10:50 Generating Magnetic Resonance Spectroscopy Imaging Data of Brain Tumours from Linear, Non-Linear and Deep Learning Models
Nathan Olliverre, Guang Yang, Greg Slabaugh, Constantino Carlos Reyes-Aldasoro, Eduardo Alonso

Raghav Mehta, Tal Arbel

11:05-11:15 Break

11:15-12:00 Poster Session

A machine learning approach to diffusion MRI partial volume estimation
Emmanuel Vallee, Wenchuan Wu, Francesca Galassi, Saad Jbabdi, Stephen Smith

Cross-modality image synthesis from unpaired data using CycleGAN: Effects of gradient consistency loss and training data size
Yuta Hiasa, Yoshito Otake, Masaki Takao, Takumi Matsuoka, Kazuma Takashima, Aaron Carass, Jerry Prince, Nobuhiro Sugano, Yoshinobu Sato

Data augmentation using synthetic lesions improves machine learning detection of microbleeds from MRI
Saba Momeni, Amir Fazllolahi, Pierrick Bourgeat, Parnesh Raniga, Paul Yates, Nawaff Yassi, Desmond Patricia, Yongsheng Gao, Jurgen Fripp, Olivier Salvado

Medical Image Synthesis for Data Augmentation and Anonymization using Generative Adversarial Networks
Hoo Chang Shin, Neil Tenenholtz, Jameson Rogers, Christopher Schwarz, Matthew Senjem, Jeffrey Gunter, Katherine Andriole, Mark Michalski

Lung Nodule Synthesis Using CNN-based Latent Data Representation
Dario Oliveira, Matheus Viana

Tubular Network Formation Process Using 3D Cellular Potts Model
David Svoboda, Tereza Nečasová, Lenka Tesařová, Pavel Šimara

Deep Learning based Coronary Artery Motion Artifact Compensation using Style-Transfer Synthesis in CT Images
Sunghee Jung, Soochohn Lee, Byunghwan Jeon, Yeonggul Jang, Hyuk-Jae Chang

MRI to FDG-PET: Cross-Modal Synthesis Using 3D U-Net For Multi-Modal Alzheimer’s Classification
Apoorva Sikka, Skand Vishwanath Peri, Deepti R Bathula
16 SEPTEMBER SATELLITE EVENTS

12:00-13:00  Keynote Talk The U-net does its job–so what next?  
Olaf Ronneberger

13:00-13:20  Panel discussion

13:20-13:30  Closing remarks, best paper and poster awards

SWITCH 2018: Stroke Workshop on Imaging and Treatment Challenges

09:30-09:40  Introduction

09:40-10:25  Keynote: Imaging Biomarkers for Stroke Treatment  
Prof. A. van der Lugt (Erasmus MC)

10:25-11:00  Presentations accepted papers by authors

11:00-11:30  Coffee Break

11:30-12:15  Keynote: Development of thrombectomy devices for image guided treatment of acute ischemic stroke  
Prof. M. Gounis (New England Center for Stroke Research, Univ. of Massachusetts)

12:15-13:00  Keynote: Pitfalls in stroke imaging: mimicks and chameleons  
Dr. R. Wiest (Support Center of Advanced Neuroimaging, Inselspital Bern)

13:00-13:25  Presentations accepted papers by authors

13:25-13:30  Concluding remarks

13.30  Lunch with poster session

PIPPI 2018: Prenatal, Preterm and Paediatric Image analysis

The daily program will be announced at the satellite event’s website by organizers.
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<th>Time</th>
<th>Event</th>
<th>Chair, Institution</th>
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<tbody>
<tr>
<td>09:30-09:40</td>
<td>Welcome &amp; Opening Remarks</td>
<td>Cristian A. Linte &amp; Marta Kersten, Hassan Rivaz</td>
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<tr>
<td>09:40-10:40</td>
<td>Oral Session I: Planning and Visualization in Image-Guided Neurosurgery</td>
<td>Sandrine de Ribaupierre, Western University</td>
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<td></td>
<td>• Gesture-based registration correction using a mobile augmented reality image-guided neurosurgery system</td>
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<td>• Augmented reality guidance in cerebral vascular surgery using microscopic video enhancement</td>
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<td>• Experience-based SEEG planning: from retrospective data to automated electrode trajectories suggestions</td>
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<tr>
<td>10:40-11:00</td>
<td>Short Oral Session I</td>
<td>Ingerid Reinertsen, SINTEF</td>
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<td>• Comparison of interactive and automatic segmentation of SEEG electrodes on CT postoperative images: preliminary results</td>
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<td>• Extending Microsoft’s HoloLens with Optical Tracking for Neuronavigation</td>
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<td>• A Multiuser Virtual Reality Environment for Visualizing Neuroimaging Data</td>
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<td>• Virtual Interaction and Visualisation of 3D Medical Imaging Data with VTK and Unity</td>
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<tr>
<td>11:00-11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30-12:30</td>
<td>Keynote: Klaus Engel</td>
<td>Hassan Rivaz, Concordia University</td>
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<td>Cinematic Rendering—Medical Imaging Goes to the Movies</td>
<td>Dr. Klaus Engel</td>
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<td>Principal Key Expert for visualization at Siemens Healthineers, Strategy and Innovation.</td>
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<tr>
<td>12:30-13:10</td>
<td>Oral Session II: HMD-based AR</td>
<td>Caroline Essert, University of Strasbourg</td>
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<td>• Endodontic Guided Treatment Using Augmented Reality on a Head-Mounted Display System</td>
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<td>• ARssist: Augmented Reality on a Head-Mounted Display for the First Assistant in Robotic Surgery</td>
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</tbody>
</table>
16 SEPTEMBER SATELLITE EVENTS

13:10-13:30  Short Oral Session II  
Chair: Roy Eagleson, Western University  
- BronchoX: Bronchoscopy Exploration Software for Biopsy Intervention Planning  
- Augmented Reality-based Feedback for Technician-in-the-loop C-arm Repositioning  
Augmented reality in computer assisted interventions based on patient-specific 3D printed reference  
- Endoscopic Image Enhancement with Noise Suppression

13:30-15:00  Lunch / Poster Session

15:00-16:00  Keynote: Terry Peters  
Chair: Cristian A. Linte, Rochester Institute of Technology  
AR/VR/MR in Medicine-Past, Present, and Future  
Dr. Terry Peters  
Imaging Research Laboratories  
Robarts Research Institute

16:00-16:30  Poster Session

16:30-17:00  Coffee Break / Poster Session

17:00-18:00  Oral Session III: Advanced Intra-operative Guidance and Monitoring  
Chair: David R. Holmes III, Mayo Clinic  
- Concepts for Augmented Reality Visualization to support Needle Guidance inside a 3T MRI Scanner  
- Augmented reality visualization for orthopedic surgical guidance with pre- and intra-operative multimodal image data fusion  
- Fast and accurate vision-based stereo reconstruction and motion estimation for image-guided liver surgery

18:00  Awards & Closing Remarks  
Chairs: Marta Kersten, Cristian A. Linte, Ingerid Reinersten, Hassan Rivaz
MLMIR: Machine Learning for Medical Image Reconstruction

09:30-11:00  Session I

**Keynote I:** Michael Unser, EPFL

*Approximate k-space models and Deep Learning for fast photoacoustic reconstruction*
Andreas Hauptmann

*Magnetic Resonance Fingerprinting Reconstruction via Spatiotemporal Convolutional Neural Networks*
Fabian Balsiger

*Bayesian Deep Learning for Accelerated MR Image Reconstruction*
Jo Schlemper

*Towards Arbitrary Noise Augmentation—Deep Learning for Sampling from Arbitrary Probability Distributions*
Felix Horger

11:00-13:30  Coffee Break

**Keynote II:** Jong Chul Ye, KAIST

*Left Atria Reconstruction from a Series of Sparse Catheter Paths using Neural Networks*
Alon Baram

*Detecting Anatomical Landmarks for Motion Estimation in Weight-bearing Imaging of Knees*
Bastian Bier

*Deep Learning Super-Resolution Enables Rapid Simultaneous Morphological and Quantitative Magnetic Resonance Imaging*
Akshay S Chaudhari

*Image Reconstruction via Variational Network for Real-Time Hand-Held Sound-Speed Imaging*
Orcun Goksel

*High quality ultrasonic multi-line transmission through deep learning*
Sanketh Vedula

Poster spotlight talks (all poster presenters)
13:30  

**Lunch Break and Poster Sessions**

ETER-net: End To End MR image reconstruction using Recurrent neural network  
*Changheun Oh*

Cardiac MR Motion Artefact Correction from K-space using Deep Learning-based Reconstruction  
*Ilkay Oksuz*

Complex Fully Convolutional Neural Networks for MR Image Reconstruction  
*Muneer Ahmad Dedmari*

Deep Learning based Image Reconstruction for Diffuse Optical Tomography  
*Hanene Ben Yedder*

Sparse-View CT Reconstruction Using Wasserstein GANs  
*Franz Thaler*

Improved Time-Resolved MRA using k-space Deep Learning  
*Eunju Cha*

Joint Motion Estimation and Segmentation from Undersampled Cardiac MR Image  
*Chen Qin*

A U-nets Cascade for Sparse View Computed Tomography  
*Andreas Kofler*
### CARE: Computer Assisted and Robotic Endoscopy

<table>
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<tr>
<td>09:30-9:35</td>
<td><strong>Opening Remarks</strong></td>
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</table>
| 09:35-10:35| **Keynote**<br>
Dr Sandrine de Ribaupierre<br>

**Neuroendoscopy: What are the needs and use for AR and VR?**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 10:35-10:55| **Learning to See Forces: Surgical Force Prediction with RGB-Point Cloud Temporal Convolutional Networks**
Cong Gao, Xingtong Liu, Michael Peven, Mathias Unberath, Austin Reiter |

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>11:00-11:30</td>
<td><strong>Coffee Break</strong></td>
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</table>
| 11:30-11:50| **Endo3D: Online Workflow Analysis for Endoscopic Surgeries Based on 3D CNN and LSTM**
Weixiang Chen, Feng Jianjiang, Jiwen Lu, Jie Zhou |
| 11:50-12:10| **Unsupervised learning of endoscopy video frames’ correspondences from global and local transformation**
Mohammad Ali Armin, Nick Barnes, Salman Khan, Miaomiao Liu, Florian Grimpen, Olivier Salvado |
| 12:10:12:30| **Wide-area shape reconstruction by 3D endoscopic system based on CNN decoding, shape registration and fusion**
Ryo Furukawa, Masaki Mizomori, Shinsaku Hiura, Shiro Oka, Shinji Tanaka, Hiroshi Kawasaki |
| 12:30-12:50| **Self-supervised Learning for Dense Depth Estimation in Monocular Endoscopy**
Xingtong Liu, Ayushi Sinha, Mathias Unberath, Masaru Ishii, Gregory D. Hager, Russell H. Taylor, Austin Reiter |
| 12:50-13:15| **Award Ceremony and Closing Remarks**                                                           |

### CPM: Computational Precision Medicine 2018

The daily program will be announced at the satellite event’s website by organizers.

15:00-15:45  **Keynote**  
Dr. Elisenda Eixarch jointly with MICCAI CLIP 2018 (Seminar Room 8, Granada Exhibition and Conference Centre)

15:45-16:30  **Keynote**  
Dr Leo Grady jointly with MICCAI CLIP 2018 (Seminar Room 8, Granada Exhibition and Conference Centre)

16:30-17:00  **Coffee break and move to contributed paper session room**  
(Seminar Room 1-2, Granada Exhibition and Conference Centre).

Accepted contributions session:

17:00-17:20  **Resection-based Demons Regularization for Breast Tumor Bed Propagation**  
Marek Wodzinski (AGH UST)*; Andrzej Skalski (AGH UST)

17:20-17:40  **Linear and Deformable Image Registration with 3D Convolutional Neural Networks**  
Stergios Christodoulidis (University of Bern, Switzerland)*; Mihir Sahasrabudhe (CentraleSupelec); Maria Vakalopoulou (CentraleSupelec); Guillaume Chassagnon (CentraleSupelec); Marie-Pierre Revel (Hôpital Cochin); Stavroula Mougiasakakou (University of Bern, Switzerland); Nikos Paragios (Therapanacea)

17:40-18:00  **Super Resolution of Cardiac Cine MRI Sequences Using Deep Learning**  
Nicolas Basty (University of Oxford)*; Vicente Grau (University of Oxford)

18:00-18:20  **Automated CNN-based Reconstruction of Short-Axis Cardiac MR Sequence From Real-Time Image Data**  
Eric Kerfoot (King’s College London)*; Esther Puyol Anton (King’s College London); Bram Ruijsink (King’s College London); James Clough (King’s College London); Andrew King (King’s College London); Julia A Schnabel (King’s College London)

18:20-18:40  **An Unbiased Groupwise Registration Algorithm for DCE MR Images**  
Mia Mojica (University of Ontario Institute of Technology); Mehran Ebrahimi (University of Ontario Institute of Technology)

18:40-19:00  **Closing Ceremony**
OR 2.0: Context-Aware Operating Theaters

15:00-15:05 Opening

15:05-15:35 Keynote Talk

15:35-15:50 Oral Presentation “FaceOff: Anonymizing Videos in the Operating Rooms”
Evangelos Flouty (Digital Surgery)*; Odysseas Zisimopoulos (Digital Surgery); Danail Stoyanov (Touch Surgery)

15:50-16:05 Oral Presentation “Temporal coherence-based self-supervised learning for laparoscopic workflow analysis”
Isabel Funke (National Center for Tumor Diseases (NCT) Dresden)*; Alexander Jenke (National Center for Tumor Diseases (NCT) Dresden); Sören Torge Mees (University Hospital of Dresden); Jürgen Weitz (University Hospital of Dresden); Stefanie Speidel (National Center for Tumor Diseases (NCT) Dresden); Sebastian Bodenstedt (National Center for Tumor Diseases (NCT) Dresden)

16:05-16:30 Poster Pitch Presentations

Intelligent Interruption Management System to Enhance Safety and Performance in Complex Surgical and Robotic Procedures
Roger Daglius Dias (Stratus Center for Medical Simulation, Brigham and Women’s Hospital, Harvard Medical School)*; Heather Conboy (University of Massachusetts); Jennifer Gabany (Division of Cardiac Surgery, VA Healthcare System, Boston); Lori Clarke (University of Massachusetts); Leon Osterweil (University of Massachusetts); George Avrunin (University of Massachusetts); David Arney (MGH); Julian Goldman (MGH); Giuseppe Riccardi (University of Trento); Steven Yule (STRATUS Center for Simulation, Brigham & Women’s Hospital); Marco A Zenati (Harvard Medical School)

Interactive Training and Operation Ecosystem for Surgical Tasks in Mixed Reality
Ehsan Azimi (Johns Hopkins University)*; Camilo Molina (Johns Hopkins University); Alexander Chang (Johns Hopkins University); Judy Huang (Johns Hopkins University); Chien-Ming Huang (Johns Hopkins University); Peter Kazanzides (Johns Hopkins University)

A Novel Interoperable Safety System for Improved Coordination and Communication in Cardiac Surgery
David Arney (MGH)*; Geoffrey Rance (VA); Marco A Zenati (Harvard Medical School); Julian Goldman (MGH); Srey Rithy (VA)
Automatic Cochlear Length and Volume Size Estimation”
Ibraheem Al-Dhamari (University of Koblenz and Landau)*; Sabine Bauer (University of Koblenz and Landau); Dietrich Paulus (n/a); Rania Helal (ASU); Friedrich Lisseck (BWZK Koblenz); Roland Jacob (BWZK Koblenz)

Generalized planning of nonlinear interventions
Johannes L Fauser (TU Darmstadt)*; Igor Stenin (Universitätsklinikum Düsseldorf); Julia Kristin (Universitätsklinikum Düsseldorf); Thomas Klenzner (Universitätsklinikum Düsseldorf); Jörg Schipper (Universitätsklinikum Düsseldorf); Dieter Fellner (Technische Universität Darmstadt); Anirban Mukhopadhyay (TU Darmstadt)

16:30-17:00 Coffee Break & Poster Session

17:00-17:30 Keynote Talk

17:30-17:45 Oral Presentation “A method for the context-aware assignment of medical device functions to input devices in integrated operating rooms”
Stefan Franke (Universität Leipzig)*; Max Rockstroh (Universität Leipzig); Martin Kasparick (Universität Rostock); Thomas Neumuth (Universität Leipzig)

17:45-18:00 Oral Presentation “Perioperative workflow simulation and optimization in orthopedic surgery”
Juliane Neumann (Innovation Center Computer Assisted Surgery (ICCAS), Leipzig University)

18:00-18:15 Oral Presentation “Performance Evaluation to Improve Training in Forceps-Assisted Delivery”
Mónica García-Sevilla (Department of Bioengineering and Aerospace Engineering, Universidad Carlos III de Madrid; Instituto de Investigación Sanitaria Gregorio Marañón)*; Juan De Leon (Hospital General Universitario Gregorio Marañón); Rafael Moreta-Martinez (Department of Bioengineering and Aerospace Engineering, Universidad Carlos III de Madrid; Instituto de Investigación Sanitaria Gregorio Marañón); David García-Mato (Department of Bioengineering and Aerospace Engineering, Universidad Carlos III de Madrid; Instituto de Investigación Sanitaria Gregorio Marañón); Rubén Pérez Mañanes (Hospital General Universitario Gregorio Marañón); Jose Antonio Calvo Haro (Hospital General Universitario Gregorio Marañón); Javier Pascau (Department of Bioengineering and Aerospace Engineering, Universidad Carlos III de Madrid; Instituto de Investigación Sanitaria Gregorio Marañón)

18:15-18:30 Oral Presentation “Clinical trial of information acquisition system for surgical instruments in digital operation room”
Kaori Kusuda (Tokyo Women’s Medical University)*; Kazuhiko Yamashita (Osaka University); Yoshihito Itô (Saiseikai Kurihashi Hospital); Kiyohito Tanaka (Kyoto Second Red Cross Hospital); Ken Masamune (Tokyo Women’s Medical University); Yoshihiro Muragaki (Tokyo Women’s Medical University)

18:30-19:00 Closing Remarks, Discussion and Awards
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<tr>
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<tbody>
<tr>
<td>15:00-15:05</td>
<td>Introduction</td>
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<td>15:05-15:50</td>
<td>Keynote</td>
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<td>Georg Langs, Medical University of Vienna, Austria</td>
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<td>15:50-16:30</td>
<td>Oral Session 1</td>
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<tr>
<td></td>
<td>Quantification of Local Metabolic Tumor Volume Changes by Registering</td>
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<td>Blended PET-CT Images for Prediction of Pathologic Tumor Response</td>
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<td>Sadegh Riyahi, Wookjin Choi, Chia-Ju Liu, Saad Nadeem, Shan Tan,</td>
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<td>Hualiang Zhong, Wengen Chen, Abraham Wu, James Mechalakos, Joseph</td>
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<td>Deasy, Wei Lu</td>
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<td>Automatic Segmentation of Thigh Muscle in Longitudinal 3D T1-</td>
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<td>weighted Magnetic Resonance (MR) Images</td>
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<td>Zihao Tang, Chenyu Wang, Phu Hoang, Sidong Liu, Weidong Cai, Demenic</td>
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<td>Soligo, Ruth Oilver, Michael Barnett, Ché Fornusek</td>
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<td>16:30-17:00</td>
<td>Coffee Break</td>
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<td>17:00-17:30</td>
<td>Invited Talk</td>
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<td>Jessica Taaffe, TB Portals Program, National Institutes of Health,</td>
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<td>USA</td>
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<td>17:30-18:30</td>
<td>Oral Session 2</td>
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<td></td>
<td>Detecting Bone Lesions in Multiple Myeloma Patients using Transfer</td>
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<td>Learning</td>
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<td>Matthias Perkonigg, Johannes Hofmanninger, Bjoern Menze, Marc-André</td>
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<td>Weber, Georg Langs</td>
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<td>DeepCS: Deep Convolutional Neural Network and SVM based Single</td>
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<td>Image Super-Resolution</td>
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<td>Jebaveerasignh Jebadurai, Dinesh Peter</td>
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<td>Optimizing external surface sensor locations for respiratory tumor</td>
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<td>motion prediction</td>
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<td>Yusuf Özbek, Zoltan Bardosi, Srdjan Milosavljevic, Wolfgang Freysinger</td>
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<tr>
<td>18:30-19:00</td>
<td>Closing and Best Paper Award</td>
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</tbody>
</table>
iMIMIC: Interpretability of Machine Intelligence in Medical Image Computing

15:00-16:00 Keynote: “Overview of Interpretability methods and Interpretability Beyond Feature Attribution, TCAV”
Been Kim

16:00-16:40 Accepted contributions:

Regression Concept Vectors for Bidirectional Explanations in Histopathology
Graziani et al. (HES-SO Valais)

Visualizing Convolutional Neural Networks to Improve Decision Support for Skin Lesion Classification
Van Molle et al. (U Ghent)

Automatic brain tumor grading from MRI data using convolutional neural networks and quality assessment
Pereira et al. (U Minho)

16:40-17:00 Refreshments:

17:00-17:45 Keynote: “Recent Advances in Our Ability to Explain the Predictions of Complex Models” by Scott Lundberg.

17:45-18:25 Accepted contributions:

Collaborative Human-AI (CHAI): Evidence-Based Interpretable Melanoma Classification in Dermoscopic Images
Codella et al. (IBM Research)

Towards complementary explanations using Deep Neural Network
Silva et al. (INESC TEC Porto)

Explainable Artificial Intelligence: How Users Perceive Content-based Image Retrieval for Skin Lesion Images
Sadeghi et al. (Simon Fraser University)

18:25-19:00 Group discussion and wrap-up
16 SEPTEMBER SATELLITE EVENTS

(W) DLF: Deep Learning Fails

15:00-15:10  Opening remarks

15:10-15:40  Oral session 1

15:10-15:25  Vulnerability Analysis of Chest X-Ray Image Classification Against Adversarial Attacks
  Saeid Asgari Taghanaki, Arkadeep Das, Ghassan Hamarneh

15:25-15:40  Exploring Adversarial Examples: Patterns for One-Pixel Attacks
  David Kügler, Alexander Distergoft, Arjan Kuijper, Anirban Mukhopadhyay

15:40-16:30  Keynote speaker
  Scott Acton

16:30-17:00  Coffee break

17:00-18:00  Oral session 2

17:00-17:15  Towards Robust CT-Ultrasound Registration using Deep Learning methods
  Yuanyuan Sun, Theo van Walsum

17:15-17:30  To Learn or Not to Learn Features for Deformable Registration?
  Aabhas Majumda, Raghav Mehta, Jayanthi Sivaswamy

17:30-17:45  Evaluation of strategies for PET motion correction-manifold learning vs. deep learning
  James Clough

17:45-18:00  Shortcomings of Ventricle Segmentation Using Deep Convolutional Networks
  Muhan Shao, Shuo Han, Aaron Carass, Xiang Li, Ari Blitz Jerry Prince, Lotta M Ellingsen

18:00-18:50  Keynote speaker
  Leo
### 16 SEPTEMBER SATELLITE EVENTS

**CHALLENGES**

**EndoVis18: Endoscopic Vision Challenge 2018 + CATARACTS Challenge 2018**

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<td>10:00-11:00</td>
<td>Keynote</td>
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<td>Prof. Teodor Grantcharov</td>
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<td>Improving Operating Room safety using advanced digital and analytical solutions</td>
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<td>11:00-11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30-12:30</td>
<td>Robotic Scene Segmentation</td>
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<td>12:30-13:30</td>
<td>Surgical Workflow Analysis in the SensorOR</td>
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<td>13:30-15:00</td>
<td>Lunch</td>
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<td>15:00-16:30</td>
<td>Gastrointestinal Image ANAlysis (GIANA)</td>
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<td>16:30-17:00</td>
<td>Coffee Break</td>
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<td>17:00-18:00</td>
<td>Cataracts</td>
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<td>18:00-18:15</td>
<td>Closing</td>
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**MRBrainS18: MICCAI Grand Challenge on MR Brain Image Segmentation**

The daily program will be announced at the satellite event’s website by organizers.

**IVDM3Seg: Intervertebral Disc Segmentation Challenge 2018**

The daily program will be announced at the satellite event’s website by organizers.
CuRIOUS: MICCAI Challenge 2018 for Correction of Brainshift with Intra-Operative UltraSound

15:00-15:10  Welcome & Introduction of CuRIOUS 2018
Ingerid Reinertsen, SINTEF, Norway

15:10-15:50  Keynote
Ole Solheim, MD, PhD,
St Olavs University hospital & Norwegian University of Science and Technology, Norway

Intraoperative imaging in neurosurgery-past, present and future
Ingerid Reinertsen, SINTEF, Norway

15:50 -16:30  Oral Presentation Session I

Chair: Matthieu Chabanas, Grenoble Institute of Technology, Univ. Grenoble Alpes, France

Resolve Intraoperative Brain Shift as Imitation Game
Xia Zhong, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Deformable MRI-ultrasound Registration Using 3D Convolutional Neural Network
Li Sun, Southern University of Science and Technology, China

Non-linear approach for MRI to intra-operative US registration using structural skeleton
Jisu Hong, Sungkyunkwan University, Korea

Deformable MRI-Ultrasound Registration via Attribute Matching and Mutual-saliency Weighting for Image-guided Neurosurgery
Ines Prata Machado, Brigham and Women’s Hospital, Harvard Medical School, USA

16:30-17:00  Coffee Break & Poster Session

17:00-17:40  Oral Presentation Session II
Chair: Hassan Rivaz, Concordia University, Canada

Registration of MRI and iUS data to compensate brain shift using a symmetric block-matching based approach
David Drobny, University College London, United Kingdom

Intra-operative Ultrasound to MRI Fusion with a Public Multimodal Discrete Registration Tool
Mattias P. Heinrich, University of Luebeck, Germany
Intra-operative Brain Shift Correction with Weighted Locally Linear Correlation of 3DUS and MRI
Samuel Kadoury, Polytechnique Montréal, Canada

Brain shift correction with image-based registration and its accuracy evaluation
Wolfgang Wein, ImFusion GmbH, Germany

17:40-18:15   Poster Session
18:15-18:30   Panel Discussion
18:30         Challenge Results, Award Ceremony & Closing Remarks

CPM: Computational Precision Medicine Challenge

The daily program will be announced at the satellite event’s website by organizers.
Satellite Events will take place at Conference Center and Saray Hotel.

- **Rooms highlighted in orange are at Saray Hotel**

### FULL DAY: 09:30-19:00

**AM:** 09:30-13:30

**PM:** 15:00-19:00

### TUTORIALS

- **(T) TOP GRAD:** Tutorial On Publishing, GRant writing and Academic career Development) / page: **139**
  
  AM-Conference Center-Seminar Room 8

- **(T) TACTICAL:** Tools Allowing Clinical Translation of Image Computing ALgorithms + / page: **140**
  
  AM-Conference Center-Andalucia 1

- **(T): CRIMSON:** A Hands-on demonstration of CRIMSON, an open-source simulation framework for image-based blood flow modeling / page: **141**
  
  AM-Conference Center-Seminar 1-2

- **(T) OT-Bioimaging:** Optimal Transport in Biomedical Imaging / page: **141**
  
  PM-Saray Hotel-Mocarabes Salon 6

- **(T) StatMIA:** Statistical Methods for Medical Image Analysis / page: **141**
  
  PM-Conference Center-Seminar Room 6-7

- **(T) SlicerDMRI:** SlicerDMRI Learn to use and program open-source diffusion MRI software / page: **142**
  
  PM-Conference Center-Andalucia 1
WORKSHOPS

(W) DLMIA: Deep Learning in Medical Image Analysis / page: 143
FULL DAY-Conference Center-Room D

(W) CNI: Connectomics in NeuroImaging / page: 150
FULL DAY-Saray Hotel-El Partal Salon 10

(W) ShapeMI: Workshop on Shape Analysis and Geometric Learning / page: 152
FULL DAY-Conference Center-Press Room

(W) IBSR: MICCAI 2018 Workshop on Intraoperative Brain Shift Registration / page: 155
FULL DAY-Saray Hotel-Salon Abencerrajes Salon 4

(W) MLCN: Machine Learning for Structured Data Analysis in Clinical Neuroimaging / page: 156
FULL DAY-Conference Center-Room U1

(W) GRAIL: Workshop on GRaphs in biomedicAl Image anaLysis / page: 157
FULL DAY-Saray Hotel-Salon Alcazaba Salon 1

(W) ISIC: Workshop and Challenge on Skin Image Analysis + CHALLENGE 1 / page: 158
FULL DAY-Conference Center-Seminar Room 3-4-5

(W) TIA: The First International Workshop on Thoracic Image Analysis / page: 159
FULL DAY-Conference Center-Room B

(W) Beyond MIC: a Workshop on Integrating Non-imaging and Imaging Data / page: 161
FULL DAY-Conference Center-Room Picasso

(W) CDMRI: Computational Diffusion MRI / page: 162
AM-Conference Center-Andalucia 2

(W) OMIA2018: Ophthalmic Medical Image Analysis / page: 166
AM-Conference Center-Room Machado

(W) ML-CDS’18: MICCAI Workshop on Multimodal Learning for Clinical Decision Support / page: 171
AM-Conference Center-Room Albeniz

(W) SaMBa: Sipaim-Miccai Biomedical Workshop / page: 171
PM-Conference Center-Room Machuca

PM-Saray Hotel-Sala de los Reyes Salon 3

(W) Patch-MI: 4th International Workshop on Patch-based Techniques in Medical Imaging / page: 174
PM-Conference Center-Seminar Room 1-2
CHALLENGES

(C) ISIC: Challenge on Dermoscopic Skin Lesion Analysis Toward Melanoma Detection 2018 (with workshop nr. 41) / page: 158
FULL DAY-Conference Center-Seminar Room 3-4-5

(C) MoNuSeg: Multi-Organ Histopathology Nucleus Segmentation Challenge for H&E Stained Images 2018 / page: 175
FULL DAY-Conference Center-Room C

(C) MSD: Medical Segmentation Decathlon / page: 175
PM-Conference Center-Room Albeniz

(C) MUSHAC: Multi-shell diffusion MRI harmonisation and enhancement challenge / page: 165
PM-Conference Center-Andalucia 2

(C) REFUGE: Retinal Fundus Glaucoma Challenge / page: 167
PM-Conference Center-Room Machado
## TUTORIALS

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<th>Time</th>
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<tr>
<td>09.30-09.55</td>
<td>Path to faculty</td>
<td>Demian Wassermann</td>
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<tr>
<td>09.55-10.20</td>
<td>Publishing 101</td>
<td>Nassir Navab</td>
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<td>10.20-10.45</td>
<td>The publisher’s side</td>
<td>Elsevier</td>
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<td>10.45-11.00</td>
<td>Panel discussion</td>
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<tr>
<td>11.30-11.55</td>
<td>Grant writing 101</td>
<td>Stephen Aylward</td>
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<tr>
<td>11.55-12.20</td>
<td>The grant agency’s side</td>
<td>Keyvan Farahani</td>
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<tr>
<td>12.20-13.00</td>
<td>Experiences and advice on grants</td>
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<tr>
<td>13.00-13.30</td>
<td>Panel discussion and closing</td>
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</tbody>
</table>
TACTICAL: Tools Allowing Clinical Translation of Image Computing Algorithms +

09:30-11:00  SESSION AM 1

09:30-09:40  Welcome—Introduction to T.A.C.T.I.C.A.L  
Spyridon Bakas (CBICA, University of Pennsylvania)

09:40-10:10  Overview of the NIH/NCI Informatics Technology for Cancer Research (ITCR) programme & the Development of the NIH/NCI Imaging Data Commons (IDC)  
Stephen D Jett (National Institutes of Health / National Cancer Institute)

10:10-10:35  Informatics Tools for Optimized Imaging Biomarkers for Cancer Research & Discovery  
Jayashree Kalpathy-Cramer (Harvard Medical School / Massachusetts General Hospital)

10:35-11:00  Tools to Analyze Morphology and Spatially Mapped Molecular Data  
Joel Saltz-Tahsin Kurc (Stony Brook University)

11:00-11:30  Coffee break

11:30-13:30  SESSION AM 2

11:30-11:55  Clinical workflows with the XNAT imaging informatics platform  
Dan Marcus (Washington University in St. Louis)

11:55-12:20  Cancer Imaging Phenomics Toolkit (CaPTk)  
Christos Davatzikos (University of Pennsylvania)

12:20-12:45  Pathology Image Informatics Platform for Visualization, Analysis and Management  
Anant Madabhushi-Nate Braman (Case Western Reserve University)

Tom Vercauteren (King’s College London)

13:10-13:30  Deep Learning Toolkit (DLTK) for Medical Image Analysis  
Martin Rajchl (Imperial College London)

13:30-15:00  Lunch break / Poster session
CRIMSON: A Hands-on demonstration of CRIMSON, an open-source simulation framework for image-based blood flow modeling

The daily program will be announced at the satellite event’s website by organizers.

OT-Bioimaging: Optimal Transport in Biomedical Imaging

15:00-16:30 Part I: Introduction to optimal transport
Part II: Transport-related transforms

16:30-17:00 Coffee Break

17:00-19:00 Part III: Applications in biomedical image analysis

StatMIA: Statistical Methods for Medical Image Analysis

15:00-15:45 Module 1. Statistical Assessment of Scan-Rescan Reliability (Shou)

- We will demonstrate the importance of assessing scan-rescan reproducibility of imaging data, especially in functional connectivity
- We will discuss various metrics available that are suitable for imaging reliability assessment based on modality.
- We will introduce statistical approaches that reduce biases caused by large scan-to-scan variations.

15:45-16:30 Module 2. Multi-scanner Harmonization of Imaging Data and Replicability Analysis (Shinohara)

- We will summarize the literature documenting biases in imaging measurements and biomarkers arising from differences across imaging protocol, scanners, and sites.
- We will discuss classical and state-of-the-art approaches for mitigating inter-scanner differences. Many of these approaches draw from the statistical literature on batch effects in genomic and gene expression analysis.
- We will discuss replicability analysis methods for benchmarking feature extraction and image harmonization approaches.

16:30-17:00 Break
17:00-17:40  **Module 3. Multiple Comparison Correction (Vandekar)***

- We will define formal hypothesis testing and motivate the problem of false positives due to multiple comparisons.
- We will define the family wise error rate (FWER) and false discovery rate (FDR) and discuss their differences.
- We will review common FWER techniques used with imaging data such as Bonferroni correction, random field theory, and permutation testing.
- We will discuss cluster-extent based thresholding.

- If time permits, we will cover recent projection-based methods for multiple testing and a parametric bootstrap approach that decreases computation time for permutation testing.

17:40-18:20  **Module 4. Confounding and Multivariate Pattern Analysis (Linn)***

- We will illustrate how multivariate pattern analyses based on observational imaging data can be biased if there is confounding by non-imaging variables such as age and sex.
- We will discuss univariate and other methods that aim to address this type of confounding.
- We will introduce an approach based on inverse probability weighting using propensity scores and demonstrate its effectiveness at reducing bias.

18:20-19:00  **Module 5. Statistical Significance Maps for Machine Learning Methods (Davatzikos)***

- We will present methods for inference on weight maps derived from machine learning models.
- We will discuss regional filtering and the effect of scale in which the statistical analysis is performed.

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**SlicerDMRI: SlicerDMRI Learn to use and program open-source diffusion MRI software**

15:00-15:30  **Introduction to Slicer, SlicerDMRI, WMA, and Slicer Extensions for Sharing Your Software**

15:30-16:00  **Hands-on Interactive Diffusion MRI Data Types and Visualization using Medical Reality Modeling Language**

16:00-16:30  **Hands-on Automated White Matter Parcellation using Anatomically Curated Tractography ORG Atlas**

16:30-17:00  **Coffee Break**

17:00-18:30  **Hands-On Python Programming: Create Your Own Slicer Module as Fast as You Can**
**WORKSHOPS**

**DLMIA: Deep Learning in Medical Image Analysis**

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>09:45-10:00</td>
<td>Opening remarks</td>
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<tr>
<td>10:00-11:00</td>
<td>Invited Talk by Prof. Hayit Greenspan</td>
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<td>Prof. Alison Noble</td>
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<td>12:30-13:30</td>
<td>Oral presentations-Session 1</td>
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<td><strong>Automatic Segmentation of Pulmonary Lobes Using a Progressive Dense V-Network</strong></td>
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<td>Abdullah-Al-Zubaer Imran*, University of California, Los Angeles; Ali Hatamizadeh,</td>
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<td>University of California, Los Angeles; Shilpa Pundi Ananth, VoxelCloud Inc; Xiaowei Ding,</td>
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<td>VoxelCloud Inc.; Demetri Terzopoulos, University of California, Los Angeles; Nima</td>
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<td>Tajbakhsh, VoxelCloud Inc.</td>
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<td>Cambridge; Lisa Koch, ETH Zurich; Ender Konukoglu, ETH Zurich; Christian Baumgartner</td>
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<td>Monte-Carlo Sampling applied to Multiple Instance Learning for Histological Image</td>
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<td>Classification.</td>
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<td>Marc Combalia, Veronica Vilaplana*, Technical University of Catalonia (UPC)</td>
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<tr>
<td>13:10-13:30</td>
<td>Poster Session + Lunch</td>
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<td>13:30-15:00</td>
<td>Deep semi-supervised segmentation with weight-averaged consistency targets.</td>
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<td>Christian Perone*, NeuroPoly Lab, Institute of Biomedical Engineering, Polytechnique</td>
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<td>Montreal; Julien Cohen-Adad, NeuroPoly Lab, Institute of Biomedical Engineering,</td>
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<td>Polytechnique Montreal.</td>
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<td><strong>Handling Missing Annotations for Semantic Segmentation with Deep ConvNets.</strong></td>
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<td>Olivier Petit*, Visible Patient; Nicolas Thome, CNAM, Paris; Arnaud Charnoz, Visible</td>
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<td>Patient; alexandre hostettler, IRCAD France; Luc Soler, IRCAD</td>
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</tbody>
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Mohammad Jafari*, University of British Columbia; Hany Girgis, Vancouver General Hospital; Zhibin Liao, The University of British Columbia; Delaram Behnami, UBC; Amir Abdi, University of British Columbia; Hooman Vaseli, University of British Columbia; Christina Luong, Vancouver General Hospital; Robert Rohling, University of British Columbia; Ken Gin, Vancouver General Hospital; Terasa Tsang, Vancouver General Hospital; Purang Abolmaesumi, The Univ. of British Columbia

Mengliu Zhao*, Simon Fraser University; Ghassan Hamarneh, Simon Fraser University

3D Deep Affine-Invariant Shape Learning for Brain MR Image Segmentation.
Zhou He*, The Hong Kong University of Science and Technology; SIQI BAO, HKUST; Albert Chung, Hong Kong University of Science and Technology

Automatic Detection of Patients with a High Risk of Systolic Cardiac Failure in Echocardiography.
Delaram Behnami*, UBC; Christina Luong, Vancouver General Hospital; Hooman Vaseli, University of British Columbia; Amir Abdi, University of British Columbia; Hany Girgis, Vancouver General Hospital; Dale Hawley, Vancouver General Hospital; Robert Rohling, University of British Columbia; Ken Gin, Vancouver General Hospital; Terasa Tsang, Vancouver General Hospital; Purang Abolmaesumi, The Univ. of British Columbia

Lihao Liu*, The Chinese University of Hong Kong; Qi Dou, The Chinese University of Hong Kong; Hao Chen, The Chinese University of Hong Kong; Iyiola Olatunji, Chinese University of Hong Kong; Jing Qin, The Hong Kong Polytechnic University; Pheng-Ann Heng, The Chinese University of Hong Kong

Active Deep Learning with Fisher Information for Patch-wise Semantic Segmentation
Jamshid Sourati*, Boston Children's Hospital; Ali Gholipour, Boston Children's Hospital; Jennifer Dy, Northeastern; Sila Kurugol, Boston Children's Hospital and Harvard Medical School; Simon Warfield, Harvard University

Contextual Additive Networks to Efficiently Boost 3D Image Segmentations.
Zhenlin Xu*, UNC Chapel Hill; Zhengyang Shen, UNC; Marc Niethammer, UNC
Unsupervised Probabilistic Deformation Modeling for Robust Diffeomorphic Registration.
Julian Krebs*, Inria; Tommaso Mansi, Siemens Healthineers; Boris Mailhé, Siemens Healthineers; Nicholas Ayache, INRIA; Herve Delingette, Inria

Rapid Training Data Generation for Tissue Segmentation Using Global Approximate Block-Matching with Self-Organizing Maps.
Lee Reid*, CSIRO; Alex Pagnozzi, CSIRO

Focal Dice Loss and Image Dilation for Brain Tumor Segmentation.
Pei Wang*, Hong Kong University of Science and Technology
Albert Chung, Hong Kong University of Science and Technology

Deep Particle Tracker: Automatic Tracking of Particles in Fluorescence Microscopy Images Using Deep Learning
Roman Spilger*, University of Heidelberg; Thomas Wollmann, University of Heidelberg; Yu Qiang, University of Heidelberg; Andrea Imle, University of Heidelberg; Ji Young Lee, University of Heidelberg; Barbara Müller, University of Heidelberg; Oliver Fackler, University of Heidelberg; Ralf Bartenschlager, University of Heidelberg; Karl Rohr, DKFZ

3D Convolutional Neural Networks for Classification of Functional Connectomes
Meenakshi Khosla*, Cornell University; Keith Jamison, Cornell University; Amy Kuceyeski, Cornell University; Mert Sabuncu, Cornell

Segmentation of Head and Neck Organs-At-Risk in Longitudinal CT Scans Combining Deformable Registrations and Convolutional Neural Networks
Liesbeth Vandewinckele, KU Leuven; David Robben, KU Leuven; Wouter Crijns, UZ Leuven; Frederik Maes*, KU Leuven

Unpaired Deep Cross-modality Synthesis with Fast Training
Lei Xiang*, Shanghai Jiao Tong University; Yang Li, University of North Carolina at Chapel Hill; Weili Lin, UNC Chapel Hill; Qian Wang, Shanghai Jiao Tong University; Dinggang Shen, UNC

UOLO-automatic object detection and segmentation in biomedical images
Teresa Araújo*, INESC-TEC; Guilherme Aresta, INESC TEC; Adrian Galdran, INESC TEC; Pedro Costa, INESC TEC; Ana Maria Mendonça, Faculdade de Engenharia da Universidade do Porto; Aurélio Campilho, Faculdade de Engenharia da Universidade do Porto
Unpaired Brain MR-to-CT Synthesis using a Structure-Constrained CycleGAN
Hيران Yang*, Xi’an Jiaotong University; Jian Sun, Xi’an Jiaotong University; Aaron Carass, Johns Hopkins University, USA; Can Zhao, Johns Hopkins University; Junghoon Lee, The Johns Hopkins University School of Medicine; Zongben Xu, Xi’an Jiaotong University; Jerry Prince, JHU

Active Learning for Segmentation by Optimizing Content Information for Maximal Entropy
 Firat Ozdemir*, ETH Zurich; Zixuan Peng, ETH Zurich; Christine Tanner, ETH-Zurich; Philipp Fürnstahl, University Hospital Balgrist; Orcun Goksel, ETH Zurich

Weakly Supervised Localisation for Fetal Ultrasound Images
Nicolas Toussaint*, King’s College London; Bishesh Khanal, King’s College London; Matthew Sinclair, Imperial College London; Alberto Gomez, KCL; Emily Skelton, King’s College London; Jacqueline Matthew, KCL; Julia A. Schnabel, King’s College London

PIMMS: Permutation Invariant Multi-Modal Segmentation
Thomas Varsavsky*, University College London; Zach Eaton-Rosen, UCL; Carole Sudre, UCL; Parashkev Nachev, University College London; M. Jorge Cardoso, UCL

Unsupervised feature learning for outlier detection with stacked convolutional autoencoders, siamese networks and Wasserstein autoencoders: application to epilepsy detection
Zaruhi Alaverdyan*, CREATIS/INSA Lyon; Jiazheng Chai, CREATIS/INSA Lyon; Carole Lartizien, CREATIS

Semi-Automated Extraction of Crohns Disease MR Imaging Markers using a 3D Residual CNN with Distance Prior
Yechiel Lamash*, Boston Children’s Hospital and Harvard Medical School; Sila Kurugol, Boston Children’s Hospital and Harvard Medical School; Simon Warfield, Harvard University

Learning to Decode 7T-like MR Image Reconstruction from 3T MR Images
Aditya Sharma*, IIT MANDI; Prabhjot Kaur, Indian Institute of Technology, Mandi; Aditya Nigam, IIT mandi; Arnav Bhavsar, IIT Mandi

Nonlinear adaptively learned optimization for object localization in 3D medical images
Mayalen Etcheverry*, Siemens Healthineers; Bogdan Georgescu, Siemens Healthineers; Benjamin Odry, Siemens Healthineers; Thomas Re, Siemens Healthineers; Shivan Kaushik, Siemens Healthineers; Bernhard Geiger, Siemens Healthineers; Mariappan Nadar, Siemens Healthineers; Sasa Grbic, Siemens Healthineers; Dorin Comaniciu, Siemens Healthineers
SCAN: Structure Correcting Adversarial Network for Organ Segmentation in Chest X-rays

Computed Tomography Image Enhancement using 3D Convolutional Neural Network
Meng Li*, Peking University; Shiwen Shen, UCLA; Wen Gao, PKU; William Hsu, Ucla; Jason Cong, Nil

Pediatric Bone Age Assessment Using Deep Convolutional Neural Networks
Vladimir Iglovikov, ods.ai; Alexander Rakhlin, Neuromation OU; Alexandr A. Kalinin*, University of Michigan; Alexey Shvets, Massachusetts Institute of Technology

Automatic myocardial strain imaging in echocardiography using deep learning
Andreas Østvik*, Norwegian University of Science and Technology; Erik Smistad, Norwegian University of Science and Technology; Torvald Espeland, Norwegian University of Science and Technology; Erik Andreas Rye Berg, Norwegian University of Science and Technology; Lasse Løvstakken, Norwegian University of Science and Technology

Longitudinal detection of radiological abnormalities with time-modulated LSTM
Giovanni Montana, Kings College London; Ruggiero Santeramo*, University of Warwick; Samuel Withey, King’s College London

Iterative Segmentation from Limited Training Data: Applications to Congenital Heart Disease
Danielle Pace*, MIT; Adrian V Dalca, MIT; Tom Brosch, Philips Research Hamburg; Tal Geva, Boston Children’s Hospital; Andrew Powell, Boston Children’s Hospital; Jürgen Weese, Philips GmbH Innovative Technologies; Mehdi Hedjazi, Harvard Medical School and Boston Children’s Hospital; Polina Golland, MIT

ScarGAN: Chained Generative Adversarial Networks to Simulate Pathological Tissue on Cardiovascular MR Scans
Felix Lau*, Arterys; Tom Hendriks, University Medical Center Groningen; Jesse Lieman-Sifry, Arterys; Sean Sall, Arterys; Daniel Golden, Arterys

Oral presentations will have a chance to have a poster presentation:

Automatic Segmentation of Pulmonary Lobes Using a Progressive Dense V-Network.
Abdullah-Al-Zubaer Imran*, University of California, Los Angeles; Ali Hatamizadeh, University of California, Los Angeles; Shilpa Pundi Ananth, VoxelCloud Inc; Xiaowei Ding, VoxelCloud Inc.; Demetri Terzopoulos, University of California, Los Angeles; Nima Tajbakhsh, VoxelCloud Inc.
Learning to Segment Medical Images with Scribble-Supervision Alone.
Yigit Baran Can, ETH Zurich; Krishna Chaitanya, ETH Zurich; Basil Mustafa, University of Cambridge; Lisa Koch, ETH Zurich; Ender Konukoglu, ETH Zurich; Christian Baumgartner *, ETH Zurich.

Monte-Carlo Sampling applied to Multiple Instance Learning for Histological Image Classification.
Veronica Vilaplana*, Technical University of Catalonia (UPC)

Reinforced Auto-Zoom Net: Towards Accurate and Fast Breast Cancer Segmentation in Whole-slide Images
Nanqing Dong*, Cornell University; Michael C. Kampffmeyer, Universitet i Tromsø; Xiaodan Liang, Carnegie Mellon University; Zeya Wang, Rice University; Wei Dai, Petuum Inc.; Eric P. Xing, Carnegie Mellon University

Multi-Scale Residual Network with Two Channels of Raw CT Image and Its Differential Excitation Component for Emphysema Classification
Liying Peng*, Zhejiang University, China; Lanfen Lin, Zhejiang University; Hongjie Hu, Department of Radiology, Sir Run Run Shaw Hospital; huali li, Department of Radiology, Sir Run Run Shaw Hospital; Qingqing Chen, Zhejiang University School of Medicine, Sir Run Run Shaw Hospital; dan wang, Department of Radiology, Sir Run Run Shaw Hospital; Xian-Hua Han, Yamaguchi University; Yutaro Iwamoto, Ritsumeikan University; Yen-Wei Chen, Ritsumeikan University

UNet++: A Nested U-Net Architecture for Medical Image Segmentation
Zongwei Zhou, Arizona State University; Md Mahfuzur Rahman Siddiquee, Arizona State University; Nima Tajbakhsh, Arizona State University; Jianming Liang*, Arizona State University, USA

Learning Optimal Deep Projection of 18F-FDG PET Imaging for Early Differential Diagnosis of Parkinsonian Syndromes
Shubham Kumar *, Technical University of Munich; Abhijit Guha Roy, Ludwig Maximilian University; Ping Wu, Fudan University; Sailesh Conjeti, Technical University of Munich; R. S. Anand, Indian Institute of Technology, Roorkee; Jian Wang, Fudan University; Igor Yakushev, Technical University of Munich; Stefan Förster, Technical University of Munich; Markus Schweiger, Klinikum Rechts der Isar, TUM; Sung-Cheng Huang, University of California, Los Angeles; Axel Rominger, University of Munich; Chuantao Zuo, Fudan; Kuangyu Shi, Technical University of Munich
20 SEPTEMBER SATELLITE EVENTS

15:00-15:40  Oral presentations-Session 2

Reinforced Auto-Zoom Net: Towards Accurate and Fast Breast Cancer Segmentation in Whole-slide Images
Nanqing Dong*, Cornell University; Michael C. Kampffmeyer, Universitet i Tromsø; Xiaodan Liang, Carnegie Mellon University; Zeya Wang, Rice University; Wei Dai, Petuum Inc.; Eric P. Xing, Carnegie Mellon University (3:00-3:20pm)

Multi-Scale Residual Network with Two Channels of Raw CT Image and Its Differential Excitation Component for Emphysema Classification
Liying Peng*, Zhejiang University, China; Lanfen Lin, Zhejiang University; Hongjie Hu, Department of Radiology, Sir Run Run Shaw Hospital; huali li, Department of Radiology, Sir Run Run Shaw Hospital; Qingqing Chen, Zhejiang University School of Medicine,Sir Run Run Shaw Hospital; dan wang, Department of Radiology, Sir Run Run Shaw Hospital; Xian-Hua Han, Yamaguchi University; Yutaro Iwamoto, Ritsumeikan University; Yen-Wei Chen, Ritsumeikan University (3:20-3:40pm)

15:40-16:40  Industry Session

15:40-15:55  Imsight
15:50-16:10  Hyperfine
16:10-16:25  Nvidia
16:25-17:00  Coffee Break

17:00-18:00  Invited Talk 3 by Christopher Semturs (Google Research)
Deep Learning for Retinal Imaging

18:00-18:40  Oral presentations-Session 3
UNet++: A Nested U-Net Architecture for Medical Image Segmentation
Zongwei Zhou, Arizona State University; Md Mahfuzur Rahman Siddiquee, Arizona State University; Nima Tajbakhsh, Arizona State University; Jianming Liang*, Arizona State University, USA (6:00-6:20pm)

Learning Optimal Deep Projection of 18F-FDG PET Imaging for Early Differential Diagnosis of Parkinsonian Syndromes
Shubham Kumar *, Technical University of Munich; Abhijit Guha Roy, Ludwig Maximilian University; Ping Wu, Fudan University; Sailesh Conjeti, Technical University of Munich; R. S. Anand, Indian Institute of Technology, Roorkee; Jian Wang, Fudan University; Igor Yakushev, Technical University of Munich; Stefan Förster, Technical University of Munich; Markus Schwaiger, Klinikum Rechts der Isar, TUM; Sung-Cheng Huang, University of California, Los Angeles; Axel Rominger, University of Munich; Chuantao Zuo, Fudan; Kuangyu Shi, Technical University of Munich

18:40-19:00  Awards Ceremony and closing remarks
CNI: Connectomics in NeuroImaging

08:30-09:20  Registration, speaker and poster-pitch check-in, and poster setup
09:20-09:25  Opening Remarks
09:30-10:30  Keynote Speaker
Dr. Martijn van den Heuvel, Professor, Vrije Universiteit and VU Medical Center
Amsterdam See Talk Details
10:30-11:00  Poster Power Pitch
11:00-11:30  Coffee break
11:30-11:50  Poster session
11:50-12:10  Oral Presentation #O1
12:10-12:30  Oral Presentation #O2
12:30-13:30  Keynote Speaker
Dr. Dafnis Batalle, Assistant Professor, King’s College London See Talk Details
13:30-15:00  Lunch and poster session
15:00-15:20  Oral Presentation #O3
15:20-15:40  Oral Presentation #O4
15:40-16:00  Oral Presentation #O5
16:00-16:30  Poster session
16:30-17:00  Coffee break
17:00-18:00  Keynote Speaker
Dr. Gustavo Deco, Research Professor, The Computational Neuroscience Group at
Universitat Pompeu Fabra See Talk Details
18:00-18:15  Closing remarks and best paper and poster awards

Oral Presentations
O1-Neonatal morphometric similarity networks predict atypical brain development
associated with preterm birth
Paola Galdi, Manuel Blesa Cabez, James Boardman, Gemma Sullivan, Gillian Lamb, David
Stoye, Alan Quigley, Michael Thrippleton, and Mark E. Bastin
O2-Heritability Estimation of Reliable Connectomic Features
Linhui Xie, Enrico Amico, Paul Salama, Yu-chien Wu, Shiaofen Fang, Olaf Sporns, Andrew Saykin, Joaquin Goni, Jingwen Yan, and Li Shen

O3-Topological Data Analysis of Functional MRI Connectivity in Time and Space Domains
Keri Anderson, Jeffrey Anderson, Sourabh Palande, and Bei Phillips

O4-Defining Patient Specific Functional Parcellations in Lesional Cohorts via Markov Random Fields
Naresh Nandakumar, Niharika D’Souza, Jeffrey Craley, Komol Manzoor, Jay Pillai, Sachin Gujar, Haris Sair, and Archana Venkataraman

O5-Towards Effective Functional Connectome Fingerprinting
Kendrick Li and Gowtham Atluri

Poster Presentations
P1-Towards ultra-high resolution 3D reconstruction of a whole rat brain from 3D-PLI data
Sharib Ali

P2-FOD-based Registration for Susceptibility Distortion Correction in Connectome Imaging
Yuchuan Qiao, Wei Sun, and Yonggang Shi

P3-GIFE: Efficient and Robust Group-wise Isometric Fiber Embedding
Junyan Wang and Yonggang Shi

P4-Intact Connectional Morphometricity Learning using Multi-View Morphological Brain Networks with Application to Autism Spectrum Disorder
Alaa Bessadek and Islem Rekik

P5-Riemannian Regression and Classification Models of Brain Networks Applied to Autism
Eleanor Wong, Jeffrey Anderson, Brandon Zielinski, and Tom Fletcher

P6-Data-Specific Feature Selection Method Identification for Most Reproducible Connectomic Feature Discovery Fingerprinting Brain States
Nicolas Georges and Islem Rekik

P7-Connectivity-Driven Brain Parcellation via Consensus Clustering
Anvar Kurmukov, Ayagoz Mussabayeva, Yulia Dodonova, Daniel Moyer, and Boris Gutman

P8-GRAND: Unbiased Connectome Atlas of Brain Network by Groupwise Graph Shrinkage and Network Diffusion
Guorong Wu, Brent C. Munsell, Paul Laurienti, and Moo K. Chung
P9-Structural subnetwork evolution across the lifespan: rich-club, feeder, seeder
Markus Schirmer and Ai Wern Chung

P10-Multi-Modal Brain Tensor Factorization: Preliminary Results with AD Patients
Göktekin Durusoy, Abdullah Karaaslanlı, Demet Yüksel Dal, Zerrin Yıldırım, and Burak Acar

P11-Functional Criticality in the Human Brain: Physiological, Behavioral and Neurodevelopmental Correlates
Lili Jiang

P12-Vector Graphs could reveal functional polymorphism of brain regions
Claudio Tomazzoli, Ilaria Boscolo Galazzo, Silvia Storti, Matteo Cristani, and Gloria Menegaz

ShapeMI: Workshop on Shape Analysis and Geometric Learning

08:30-09:30 Registration
09:30-11:00 Satellite Events AM(I)
09:30-09:40 Opening (10 min)
09:40-10:25 Keynote for “Shape Applications/Validation/Software”
Stanley Durleman
10:25-10:45 Deformetrica 4: an open-source software for statistical shape analysis
Alexandre Bône, Maxime Louis, Benoît Martin, Stanley Durrleman
10:45-11:05 On the Evaluation and Validation of Off-the-shelf Statistical Shape Modeling Tools: A Clinical Application
Anupama Goparaju, Ibolya Csécs, Alan Morris, Evgueni Kholmovski, Nassir Marrouche, Ross Whitaker, Shireen Elhabian
11:00-11:30 Coffee Break
11:30-13:30 Satellite Events AM(II)
11:30-11:50 Characterizing Anatomical Variability And Alzheimer’s Disease Related Cortical Thinning in the Medial Temporal Lobe Using Graph-Based Groupwise Registration And Point Set Geodesic Shooting
Long Xie, Laura Wisse, Sandhitsu Das, Ranjit Ittyerah, Jiancong Wang, David Wolk, Paul A Yushkevich
11:50-12:10 Interpretable Spiculation Quantification for Lung Cancer Screening
Wookjin Choi, Saad Nadeem, Sadegh Riyahi, Joseph Deasy, Allen Tannenbaum, Wei Lu
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 12:10-12:55 | Keynote for “Shape Methods”  
Michael Bronstein |
| 12:55-13:15 | Deformable Cubic Hermite Mesh Templates for Statistical Liver Shape Analysis  
Hao Bo Yu, Yui Nakagawa, Harvey Ho, Atsushi Saito, Akinobu Shimizu |
| 13:15-13:35 | Global divergences between measures: from Hausdorff distance to Optimal Transport  
Jean Feydy, Alain Trouve |
| 13:35-15:00 | Lunch / Poster and Demo Session |
| 15:00-16:30 | Satellite Events PM(I) |
| 15:00-15:20 | Parallel Transport of Surface Deformations from Pole Ladder to Symmetrical Extension  
Shuman Jia, Nicolas Duchateau, Pamela Moceri, Maxime Sermesant, Xavier Pennec |
| 15:20-15:40 | 4D Continuous Medial Representation Trajectory Estimation for Longitudinal Shape Analysis  
Sungmin Hong, James Fishbaugh and Guido Gerig |
| 15:40-16:25 | Keynote for “Shape classification and deep learning”  
Daniel Rueckert |
| 16:30-17:00 | Coffee Break |
| 17:00-19:00 | Satellite Events PM(II) |
| 17:00-17:20 | Deep Shape Analysis on Abdominal Organs for Diabetes Prediction  
Benjamin Gutierrez Becker, Sergios Gatidis, Daniel Gutmann, Anette Peters, Christopher Schlett, Fabian Bamberg, Christian Wachinger |
| 17:20-17:40 | Nonparametric Aggregation of Geodesic Trends for Longitudinal Data Analysis  
Kris M. Campbell, P. Thomas Fletcher |
| 17:40-18:00 | DeepSSM: Deep Learning Framework for Statistical Shape Modeling from Raw Images  
Riddhish Bhalodia, Shireen Elhabian, Ladislav Kavan, Ross Whitaker |
| 18:00-19:00 | Discussion/Conclusions/Adjourn |
20 SEPTEMBER SATELLITE EVENTS

Posters and Demos:

1. **Deformable Cubic Hermite Mesh Templates for Statistical Liver Shape Analysis (with Demo)**
   Hao Bo Yu, Yui Nakagawa, Harvey Ho, Atsushi Saito, Akinobu Shimizu

2. **Deformetrica 4: an open-source software for statistical shape analysis (with Demo)**
   Alexandre Bône, Maxime Louis, Benoit Martin, Stanley Durrleman

3. **Probabilistic Fitting of Active Shape Models (with Demo)**
   Andreas Morel-Forster, Thomas Gerig, Marcel Lüthi and Thomas Vetter

4. **Shape and Facet Analyses of Alveolar Airspaces of the Lung (with Demo)**
   Roman Grothausmann, Christian Mühlfeld, Matthias Ochs, Lars Knudsen

5. **SlicerSALT: Shape AnaLysis Toolbox (with Demo)**
   Jared Vicory, Laura Pascal, James Fishbaugh, Juan Prieto, Mahmoud Mostafa, Chao Huang, Hina Shah, Junpyo Hong, Zhiyuan Liu, Loic Michoud, Jean-Christophe Fillion-Robin, Guido Gerig, Hongtu Zhu, Stephen Pizer, Martin Styner, Beatriz Paniagua

6. **3D Shape Analysis for Coarctation of the Aorta**
   Lina S. I. Gundelwein, Heiko Ramm, Leonid Goubergrits, Markus Kelm, Hans Lamecker

7. **Automatic extraction of a piecewise symmetry surface of a 3D mesh: application to scoliosis**
   Marion Morand, Olivier Comas, Gérard Subsol, Christophe Fiorio

8. **Combining deep learning and shape priors for bi-ventricular segmentation of volumetric cardiac magnetic resonance images**
   Jinming Duan, Jo Schlemper, Wenjia Bai, Timothy J W Dawes, Ghalib Bello, Carlo Biffi, Georgia Doumou, Antonio De Marvao, Declan P O'Regan, Daniel Rueckert

9. **Deep Learning for Quality Control of Subcortical Brain 3D Shape Models**

10. **Discrimination of Volumetric Shapes using Orthogonal Tensor Decomposition**
    Hayato Itoh, Atsushi Imiya

11. **Image Registration and Predictive Modeling: Learning the Metric on the Space of Diffeomorphisms**
    Ayagoz Mussabayeva, Alexey Kroshnin, Anvar Kurmukov, Yulia Denisova, Li Shen, Shan Cong, Lei Wang, Boris Gutman
12. Joint Registration of Multiple Generalized Point Sets
Zhe Min, Jiaole Wang, Max Q.-H. Meng

13. Morphometric Sex Estimation from the Hip Bone by Means of the HIP 1.1 Software
Miroslav Králík, Ondřej Klíma, Petra Urbanová, Lenka Polcerová, Martin Čuta

14. OCT segmentation: Integrating open parametric contour model of the retinal layers and shape constraint to the Mumford-Shah functional
Jinming Duan, Weicheng Xie, Ryan Wen Liu, Christopher Tench, Irene Gottlob, Frank Proudlock, Li Bai

15. Organ-At-Risk Segmentation in Brain MRI using Model-Based Segmentation: Benefits of Deep Learning-Based Boundary Detectors
Eliza Orasanu, Tom Brosch, Carri Glide-Hurst, Steffen Renisch

16. Segmenting Bones, Based on Statistical Shape Model and Local Template Matching
Elham Taghizadeh, Alexandre Terrier, Fabio Becce, Alain Farron, Philippe Büchler

17. Shape Analysis of White Matter Tracts via the Laplace-Beltrami Spectrum
Lindsey Kitchell, Dan Bullock, Soichi Hayashis, Franco Pestilli

18. Uncertainty Quantification in CNN-Based Surface Prediction Using Shape Priors
Katarina Tothova, Sarah Parisot, Matthew Lee, Esther Puyol Anton, Lisa Koch, Andrew King, Ender Konukoglu, Marc Pollefeys

19. Virtual 2D-3D Fracture Reduction with Bone Length Recovery Using Statistical Shape Models
Ondřej Klíma, Roman Madeja, Michal Španěl, Martin Čuta, Pavel Zemčík, Pavel Stoklásek, Aleš Mizera

IBSR: MICCAI 2018 Workshop on Intraoperative Brain Shift Registration

The daily program will be announced at the satellite event’s website by organizers.
## MLCN: Machine Learning for Structured Data Analysis in Clinical Neuroimaging

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<td>08:30-09:30</td>
<td>Registration</td>
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<tr>
<td>09:30-10:00</td>
<td>Opening</td>
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<tr>
<td>10:00-11:00</td>
<td>Keynote 1</td>
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<tr>
<td></td>
<td>Christos Davatzikos</td>
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<tr>
<td>11:00-11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30-11:50</td>
<td>Oral Presentation 1: Finding effective ways to (machine) learn</td>
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<td></td>
<td>fMRI-based classifiers from multi-site data</td>
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<td>Roberto Vega, Russ Greiner</td>
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<tr>
<td>11:50-12:10</td>
<td>Oral Presentation 2: Alzheimer's Disease Modelling and Staging</td>
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<td>through Independent Gaussian Process Analysis of</td>
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<td>Spatio-Temporal Brain Changes</td>
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<td>Clement Abi Nader, Nicholas Ayache, Philippe Robert, Marco Lorenzi</td>
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<tr>
<td>12:10-12:30</td>
<td>Oral Presentation 3: Visualizing Convolutional Networks for</td>
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<td>MRI-based Diagnosis of Alzheimer's Disease</td>
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<td></td>
<td>Johannes Rieke, Fabian Eitel, Martin Weygandt, John Dylan Haynes,</td>
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<td>Kerstin Ritter</td>
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<td>12:30-13:30</td>
<td>Keynote 2</td>
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<td>Georg Langs</td>
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<td>13:30-15:00</td>
<td>Lunch</td>
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<td>15:00-16:00</td>
<td>Keynote 3</td>
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<td>Gael Varoquaux</td>
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<td>16:00-16:20</td>
<td>Oral Presentation 4: Multi-Channel Stochastic Variational Inference</td>
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<td>for the Joint Analysis of Heterogeneous Biomedical Data in Alzheimer's</td>
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<td>Disease</td>
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<td>Luigi Antelmi, Nicholas Ayache, Philippe Robert, and Marco Lorenzi</td>
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<tr>
<td>16:20-16:40</td>
<td>Oral Presentation 5: 3D Multi-Scale Dense Networks for Multiple</td>
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<td>Sclerosis Classification based on Structural MRI Data</td>
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<td></td>
<td>Fabian Eitel and Kerstin Ritter</td>
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<tr>
<td>16:40-17:00</td>
<td>Coffee Break</td>
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<tr>
<td>17:00-18:00</td>
<td>General /Panel Discussion</td>
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**GRAIL: Workshop on GRaphs in biomedicAl Image anaLysis**

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<tr>
<th>Time</th>
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<tr>
<td>08:30-09:30</td>
<td>Registration</td>
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<td>09:30-11:00</td>
<td>Satellite Events AM(I)</td>
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<tr>
<td>09:30-09:45</td>
<td>Opening</td>
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<tr>
<td>09:45-10:30</td>
<td>Keynote Speaker 1</td>
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<td></td>
<td>Michael Bronstein</td>
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<tr>
<td>10:30</td>
<td>Session 1: Graph CNNs</td>
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<td></td>
<td>• 2. Graph Saliency Maps through Spectral Convolutional Networks: Application to Sex Classification with Brain Connectivity</td>
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<td>• 5. Multi-modal Disease Classification in Incomplete Datasets Using Geometric Matrix Completion</td>
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<tr>
<td>11:00-11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30-12:15</td>
<td>Keynote Speaker 2</td>
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<td></td>
<td>Dimitri Van de Ville</td>
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<tr>
<td>12:15-13:30</td>
<td>Session 2: Graphs for Brain Modelling / neuroimaging/ connectomics</td>
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<td>• 3. A Graph Representation and Similarity Measures for Brain Networks with Nodal Features</td>
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<td>• 7. Modeling Brain Networks with Artificial Neural Networks</td>
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<tr>
<td>13:30-15:00</td>
<td>Poster Session</td>
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<td>15:00-16:15</td>
<td>Session 3: Graph based models for segmentation, classification and motion analysis in biomedical applications</td>
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<td>• 9. A Classification Framework for Alzheimer’s Disease based on Graph Communicability</td>
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<td>• 12. Graph-Based Multi-Organ Segmentation with Multi-Kernel Diffusion CNNs</td>
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<td>• 13. Structured RNNs and spatio-temporal graphs for motion analysis in echocardiography videos</td>
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<td>• 4. Hierarchical Bayesian Networks for Modeling Inter-Class Dependencies: Application to Semi-Supervised Cell Segmentation</td>
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<tr>
<td>16:15-16:30</td>
<td>GGRAIL Best paper award and closing</td>
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### ISIC: Workshop and Challenge on Skin Image Analysis + CHALLENGE 1

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:30</td>
<td>Opening Remarks</td>
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<tr>
<td>9:40</td>
<td>Overview of Challenge Tasks, Evaluation Protocol, and Top Results</td>
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<tr>
<td>10:00</td>
<td>Challenge Participants Oral Seminar Session, Part 1</td>
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<tr>
<td>10:00</td>
<td>Task 1 - Team HolidayBurned</td>
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<td>10:15</td>
<td>Task 1 - Team MTLab</td>
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<td>10:30</td>
<td>Task 2 - Navid Alemi Koohbanani</td>
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<td>10:45</td>
<td>Task 2 - Team Mammoth</td>
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<td>11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:30</td>
<td>Challenge Participants Oral Seminar Session, Part 2</td>
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<tr>
<td>11:30</td>
<td>Task 3 - Jordan Yap</td>
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<td>11:45</td>
<td>Task 3 - Nils Gessert</td>
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<tr>
<td>12:00</td>
<td>Invited Talk #1</td>
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<td>Josep Malvehy / Rafael Garcia</td>
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<td>12:30</td>
<td>Invited Talk #2</td>
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<td>Olivier Gevaert</td>
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<td>13:00</td>
<td>Invited Talk #3</td>
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<td>Tracy Petrie</td>
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<td>13:30</td>
<td>Lunch Break</td>
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<td>15:00</td>
<td>Invited Talk #4</td>
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<td>Gabriela Oana Cula</td>
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<tr>
<td>15:30</td>
<td>Paper Submissions Oral Seminar Session, Part 1</td>
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<tr>
<td>15:30</td>
<td>&quot;Skin Lesion Synthesis with Generative Adversarial Networks&quot;</td>
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<td></td>
<td>Alceu Bissoto, et al.</td>
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<td>15:45</td>
<td>&quot;Generating Highly Realistic Images of Skin Lesions with GANs&quot;</td>
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<td></td>
<td>Christoph Baur, et al.</td>
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<tr>
<td>16:00</td>
<td>&quot;Data Augmentation for Skin Lesion Analysis&quot;</td>
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<td></td>
<td>Fabio Perez, et al.</td>
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<tr>
<td>16:15</td>
<td>&quot;Deeply Supervised Rotation Equivariant Network for Lesion Segmentation in Dermoscopy Images&quot;</td>
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<td>Xiaomeng Li, et al.</td>
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<td>16:30</td>
<td>Coffee Break</td>
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<tr>
<td>17:00</td>
<td>Paper Submissions Oral Seminar Session, Part 2</td>
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<tr>
<td>17:00</td>
<td>&quot;Skin Image Analysis for Erythema Migrans Detection and Automated Lyme Disease Referral&quot;</td>
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<td>P. Burlina, et al.</td>
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</tbody>
</table>
17:15  "Severity assessment of psoriatic plaques using deep CNN based Ordinal classification"
       Anabik Pal, et al.
17:30  "A Hyperspectral Dermoscopy Dataset for Melanoma Detection"
       Yanyang Gu, et al.
17:45  "A Deep Residual Architecture for Skin Lesion Segmentation"
       Venkatesh G M, et al.
18:00  "A Multi-task Framework for Skin Lesion Detection and Segmentation"
       Sulaiman Vesal, et al.
18:15  "A Structure-aware Convolutional Neural Network for Skin Lesion Classification"
       Kevin Thandiackal, et al.
18:30  Awards / Future Plans / Discussion / Closing Remarks
19:00  Workshop End

TIA: The First International Workshop on Thoracic Image Analysis

09:30-11:00  Session I: Computer-Aided Diagnosis
09:30-9:40  Workshop presentation
9:40-10:00  Oral 1-Transfer learning approach to predict biopsy-confirmed malignancy of lung nodules from imaging data: a pilot study
10:00-10:20  Oral 2-Convolutional Neural Network Based COPD and Emphysema Classifications Are Predictive of Lung Cancer Diagnosis
10:20-10:40  Oral 3-On the Relevance of the Loss Function in the Agatston Score Regression from non-ECG Gated CT Scans
10:40-11:00  Oral 4-Accurate Measurement of Airway Morphology on Chest CT images

Coffee Break

11:00-12:30  Session II: Acquisition, Enhancement and Registration
11:30-11:50  Oral 5-A CT scan harmonization technique to detect Emphysema and Small Airway Diseases
### 20 SEPTEMBER SATELLITE EVENTS

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<tr>
<td>11:50-12:10</td>
<td>Oral 6-Detecting Out-of-phase Ventilation Using 4DCT to Improve Radiation Therapy for Lung Cancer</td>
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<tr>
<td>12:10-12:30</td>
<td>Oral 7-Rigid Lens-Locally Rigid Approximations of Deformable Registration for Change Assessment in Thorax-Abdomen CT Follow-Up Scans</td>
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</tbody>
</table>
| 12:30-1:30    | Key Note<br>
*Dr. Pedro Romero (University of Granada)*<br>
*Lunch Break and Poster viewing* |
| 15:00-16:30   | Session III: Poster discussion and Segmentation I |
|               | Poster teaser and discussion |
| 15:50-16:10   | Oral 9-High throughput lung and lobar segmentation by 2D and 3D CNN on chest CT with diffuse lung disease |
| 16:10-16:30   | Oral 10-Transfer Learning for Segmentation of Injured Lungs using Coarse-to-Fine Convolutional Neural Networks |
|               | Coffe break |
| 17:00-18:00   | Session IV: Segmentation II |
| 17:00-17:20   | Oral 11-3D pulmonary artery segmentation from CTA scans using deep learning with realistic data augmentation |
| 17:20-17:40   | Oral 12-Automatic Airway Segmentation in chest CT using Convolutional Neural Networks |
| 17:40-17:50   | Adjourn |

**Poster Sessions**

- **Poster 1:** Robust Windowed Harmonic Phase Analysis with a Single Acquisition
- **Poster 2:** Lung Structures Enhancement in Chest Radiographs via CT based FCNN Training
- **Poster 3:** XeMRI to CT Lung Image Registration Enhanced with Personalized 4DCT-derived Motion Mode
Poster 4-Diffeomorphic lung registration using deep CNNs and reinforced learning
Poster 5-Automatic classification of centrilobular emphysema on CT using deep learning: comparison with visual scoring
Poster 6-Towards an automatic lung cancer screening system in low dose computed tomography
Poster 7-Tuberculosis histopathology on x ray CT
Poster 8-Improving the Segmentation of Anatomical Structures in Chest Radiographs using U-Net with an ImageNet Pre-trained Encoder

Beyond MIC: a Workshop on Integrating Non-imaging and Imaging Data

09:45-09:55  Introduction and Welcome
Adrian V. Dalca, MIT and MGH

10:00-11:00  Keynote
Imaging, Genomics and Biobanks: Lessons Learned in the ENIGMA Consortium
Paul M. Thompson, University of Southern California

11:00-11:30  Refreshments

11:30-12:20  Keynote
Understanding AD heterogeneity-a path towards Precision Medicine of the 21st century
Liana G. Apostolova, Indiana University

12:30-13:15  Presentations by authors of accepted papers
Towards Subject and Diagnostic Identifiability in the Alzheimer’s Disease Spectrum based on Functional Connectomes
Diana O. Svaldi, Joaquin Goñi, Apoorva Bharthur Sanjay, Enrico Amico, Shannon L. Risacher, John D. West, Mario Dzemidzic, Andrew Saykin, Liana Apostolova

Predicting Conversion of Mild Cognitive Impairments to Alzheimer’s Disease and Exploring Impact of Neuroimaging
Yaroslav Shmulev, Mikhail Belyaev
A Bayesian Disease Progression Model for Clinical Trajectories
Yingying Zhu and Mert R. Sabuncu

13:15-15:00 Lunch

15:00-15:50 Keynote

Title TBA
Wiro Niessen, Erasmus MC and Delft

15:55-16:30 Presentations by authors of accepted papers
Multi-modal brain connectivity study using deep collaborative learning
Wenxing Hu, Biao Cai, Vince Calhoun, and Yu-Ping Wang

Cross-Diagnostic Prediction of Dimensional Psychiatric Phenotypes in Anorexia Nervosa and Body Dysmorphic Disorder Using Multimodal Neuroimaging and Psychometric Data
Jamie D. Feusner, Wesley T. Kerr, Teena D. Moody, Aifeng F. Zhang, Mark S. Cohen, Alex D. Leow, Michael A. Strober, Don A. Vaughn

CDMRI: Computational Diffusion MRI

9.30-9:35 Welcome

9.35-10.15 Keynote Lecture 1

Towards optimal sampling in diffusion MRI
Hans Knutsson, Linköping University, Linköping, Sweden

10.15-11.00 Oral Session 1

O.1-Image reconstruction and phase corruption maps estimation in multi-shot echo planar imaging
Iñaki Rabanillo et al

O.2-A novel spatial-angular domain regularisation approach for restoration of diffusion MRI
Alessandro Mella et al

O.3-Q-space learning with synthesized training data
Chuyang Ye et al

11.00-11:30 Coffee break

11.30-12.15 Keynote Lecture 2
Diffusion MRI outside the brain
Rita Nunes, Institute for Systems and Robotics, Lisbon, Portugal

12.15-12.45  Oral Session 2

O.4-A framework for calculating time-efficient diffusion MRI protocols for anisotropic IVIM and an application in the placenta
Paddy Slator et al

O.5-Brain connectivity measures via direct sub-Finslerian front propagation on the 5D sphere bundle of positions and directions
Jorg Portegies et al

12.45-13.30  Poster presentations

P.1-Return-to-plane probability calculation from single-shell acquisitions, board CDMRI-1
Santiago Aja-Fernandez et al

P.2-Orientation-dispersed apparent axon diameter estimation via spherical mean-based alternate convex search, board CDMRI-2
Marco Pizzolato et al

P.3-A closed-form solution of rotation invariant spherical harmonic features in diffusion MRI, board CDMRI-3
Mauro Zucchelli et al

P.4-Inter-scanner harmonization of high angular resolution DW-MRI using null space deep learning, board CDMRI-4
Vishwesh Nath et al

P.5-Graph-based deep learning for prediction of longitudinal infant diffusion MRI data, board CDMRI-5
Jaeil Kim et al

P.6-Effects of diffusion MRI model and harmonization on the consistency of findings in an international multi-cohort HIV neuroimaging study, board CDMRI-6
Talia M. Nir et al

P.7-Inference of an extended short fiber bundle atlas using sulcus-based inter-subject alignment, board CDMRI-7
Nicole Labra Avila et al
20 September Satellite Events

P.8-Resolving the crossing/kissing fiber ambiguity using functionally informed COMMIT, board CDMRI-8
Matteo Frigo et al

P.9-Voxel-wise characterization of neural tracts using tractography data, board CDMRI-9
Irene Brusini et al

P.10-"Obtaining representative core streamlines for white matter tractometry of the human brain", board CDMRI-10
Maxime Chamberland et al

P.11-Longitudinal harmonization for improving tractography in baby diffusion MRI, board CDMRI-11
Khoi Huynh et al

P.12-Improving graph-based tractography plausibility using microstructure information, board CDMRI-12
Matteo Battocchio et al

P.13-Dimly, a diffusion microstructure imaging toolbox in Python to improve research reproducibility", board CDMRI-13
Abib O.Y. Alimi et al

P.14-Deterministic group tractography with local uncertainty quantification, board CDMRI-14
Andreas Nugaard Holm et al

P.15-Spatial characterisation of fibre response functions for spherical deconvolution in multiple sclerosis, board CDMRI-15
Carmen Tur et al

P.16-Edge weights and network properties in multiple sclerosis", board CDMRI-16
Elizabeth Powell et al

P.17-Tissue segmentation using sparse non-negative matrix factorization of spherical mean DMRI data, board CDMRI-17
Peng Sun et al

13:30-15.00  Lunch + Poster Viewing

15.00-15.45  Keynote Lecture 3

Current applications and future promises of machine learning in diffusion MRI
Peter Neher, German Cancer Research Center, Heidelberg, Germany
15.45-16.30  Oral Session 3

O.6-Supervised classification of white matter fibers based on neighborhood fiber orientation distributions using an ensemble of neural networks"
Devran Ugurlu et al

O.7-Measures of tractography convergence
Daniel Moyer et al

O.8-Spherical harmonic residual network for diffusion signal harmonization
Simon Koppers et al

16.30-17.00  Coffee break

17.00-17.25  MUSHAC Challenge

Keynote Lecture 1

Challenges, opportunities and clinical applications of data harmonisation in diffusion MRI
Neda Jahanshad, University of Southern California, Los Angeles, USA

17.25-17.50  MUSHAC Challenge

Keynote Lecture 2

Retrospective and prospective diffusion MRI data harmonization
Yogesh Rathi, Harvard Medical School, Boston, USA

17.50-18.45  MUSHAC Challenge

17:50-18:00  Introduction

18:00-18:15  Presentations by teams

18:15-18:30  Challenge results

18:30-18:45  Panel discussion

18:45-19.00  Concluding remarks and prizes

20:00  Social event  Restaurante Oliver, Plaza Pescadería 12, 18001 Granada

*CDMRI and MUSHAC are endorsed by the ISMRM and are sponsored by MICCAI, Restaurante Oliver Granada, NVIDIA and Siemens Healthineers
OMIA2018: Ophthalmic Medical Image Analysis

From 08:30 Registration and posters set-up

Morning: OMIA-5 workshop

09:30-09:40 Opening remarks

9:40-10:10 Oral session 1: Fundus (15’ per paper including questions)
9:40 OMIA-O-1
Classification of Findings with Localized Lesions in Fundoscopic Images using a Regionally Guided CNN
Jaemin Son, Woong Bae, Sangkeun Kim, Sang Jun Park, Kyu-Hwan Jung

9:55 OMIA-O-2
Local Estimation of the Degree of Optic Disc Swelling from Color Fundus Photography

10:10-11:00 Invited Speaker
Optical Coherence Tomography in Diabetic Microvascular Disease: What is New?
Dr Carol Cheung
Department of Ophthalmology and Visual Sciences, The Chinese University of Hong Kong

11:00-11:30 Coffee break

11:30-12:00 Oral session 2: OCT (15’ per paper including questions)

11:30 OMIA-O-3
Joint Segmentation and Uncertainty Visualization of Retinal Layers in Optical Coherence Tomography Images using Bayesian Deep Learning
Suman Sedai, Bhavna Antony, Dwarkanath Mahapatra, Rahil Garnavi

11:45 OMIA-O-4
Automatic Segmentation of Cortex and Nucleus in Anterior Segment OCT Images
Pengshuai Yin, Mingkui Tan, Huaqing Min, Yanwu Xu, Guanghui Xu, Qingyao Wu, Yunfei Tong, Higashita Risa, Jiang Liu
12:00-13:00  **Oral session 3: New Modalities** (15’ per paper including questions)

12:00  **OMIA-O-5**  
Ocular Structures Segmentation from Multi-sequences MRI using 3D Unet with Fully Connected CRFs  
Huu-Giao Nguyen, Alessia Pica, Philippe Maeder, Ann Schaltenbourg, Marta Peroni, Jan Hrbacek, Damien C. Weber, Meritxell Bach Cuadra, Raphael Sznitman

12:15  **OMIA-O-6**  
Automatic Pigmentation Grading of the Trabecular Meshwork in Gonioscopic Images  
De Giusti Andrea, Pajaro Simone, Tanito Masaki

12:30  **OMIA-O-7**  
cGAN-based lacquer cracks segmentation in ICGA image  
Hongjiu Jiang, Yuhui Ma, Weifang Zhu, Ying Fan, Yihong Hua, Qiuying Chen, Xinjian Chen

12:45  **OMIA-O-8**  
Visual Field based Automatic Diagnosis of Glaucoma Using Deep Convolutional Neural Network  
Fei Li, Zhe Wang, Guoxiang Qu, Yu Qiao, Xiulan Zhang

13:00  Release of the On-site REFUGE Test Data

13:00-13:30  **OMIA Award Ceremony and Open Discussion**

13:30-15:00  **Lunch / Poster Session**

**Afternoon: REFUGE challenge**

15:00-15:20  Introduction, Motivation and Overview of What Follows

15:20-16:30  **Oral Session I (7’+3’ Q&A per team)**

16:30-17:00  **Coffee break / Poster Session**

17:00-18:30  **Oral Session II (7’+3’ Q&A per team)**

18:30-18:50  Evaluation Procedure and Final Results/Winners Announcement

18:50-19:00  REFUGE Open Discussion
OMIA KEYNOTE

Optical Coherence Tomography in Diabetic Microvascular Disease: What is New?  
Dr Carol Cheung  
Department of Ophthalmology and Visual Sciences, The Chinese University of Hong Kong

OMIA POSTERS

#01  
Title: Ocular Structures Segmentation from Multi-sequences MRI using 3D Unet with Fully Connected CRFs  
Authors: Huu-Giao Nguyen, Alessia Pica, Philippe Maeder, Ann Schalenbourg, Marta Peroni, Jan Hrbacek, Damien C. Weber, Meritxell Bach Cuadra, Raphael Sznitman  
Email: huu.nguyen@artorg.unibe.ch

#02  
Title: Classification of Findings with Localized Lesions in Fundoscopic Images using a Regionally Guided CNN  
Authors: Jaemin Son, Woong Bae, Sangkeun Kim, Sang Jun Park, Kyu-Hwan Jung  
Email: sangjunpark@snu.ac.kr

#03  
Title: Segmentation of Corneal Nerves Using a U-Net-based Convolutional Neural Network  
Authors: Alessia Colonna, Fabio Scarpa, Alfredo Ruggeri  
Email: fabio.scarpa@unipd.it

#04  
Title: Automatic Pigmentation Grading of the Trabecular Meshwork in Gonioscopic Images  
Authors: De Giusti Andrea, Pajaro Simone, Tanito Masaki  
Email: simonepajaro@nidektechnologies.it

#05  
Title: Large Receptive Field Fully Convolutional Network for Semantic Segmentation of Retinal Vasculature in Fundus Images  
Authors: Gabriel Lepetit-Aimon, Renaud Duval, Farida Cheriet  
Email: gabriel.lepetit-aimon@polymtl.ca

#06  
Title: Explaining Convolutional Neural Networks for Area Estimation of Choroidal Neovascularization via Genetic Programming  
Authors: Yibiao Rong, Kai Yu, Dehui Xiang, Weifang Zhu, Zhun Fan, Xinjian Chen  
Email: ybrong@stu.suda.edu.cn
#07
Title: Joint Segmentation and Uncertainty Visualization of Retinal Layers in Optical Coherence Tomography Images using Bayesian Deep Learning
Authors: Suman Sedai, Bhavna Antony, Dwarikanath Mahapatra, Rahil Garnavi
Email: ssedai@au1.ibm.com

#08
Title: cGAN-based lacquer cracks segmentation in ICGA image
Authors: Hongjiu Jiang, Yuhui Ma, Weifang Zhu, Ying Fan, Yihong Hua, Qiuying Chen, Xinjian Chen
Email: xjchen@suda.edu.cn

#09
Title: Localizing Optic Disc and Cup for Glaucoma Screening via Deep Object Detection Networks
Authors: Xu Sun, Yanwu Xu, Mingkui Tan, Huazhu Fu, Wei Zhao, Tianyuan You, Jiang Liu
Email: ywxu@ieee.org

#10
Title: Fundus Image Quality-guided Diabetic Retinopathy Grading
Authors: Kang Zhou, Zaiwang Gu, Annan Li, Jun Cheng, Shenghua Gao, Jiang Liu
Email: zhoukang@shanghaitech.edu.cn

#11
Title: DeepDisc: Optic Disc Segmentation based on Atrous Convolution and Spatial Pyramid Pooling
Authors: Zaiwang Gu, Peng Liu, Kang Zhou, Yuming Jiang, Haoyu Mao, Jun Cheng, Jiang Liu
Email: guzaiwang@nimte.ac.cn

#12
Title: Large-scale Left and Right Eye Classification in Retinal Images
Authors: Peng Liu, Zaiwang Gu, Fan Liu, Yuming Jiang, Shanshan Jiang, Haoyu Mao, Jun Cheng, Lixin Duan, Jiang Liu
Email: liupengim@nimte.ac.cn

#13
Title: Automatic Segmentation of Cortex and Nucleus in Anterior Segment OCT Images
Authors: Pengshuai Yin, Mingkui Tan, Huqing Min, Yanwu Xu, Guanghui Xu, Qingyao Wu, Yunfei Tong, Higashita Risa, Jiang Liu
Email: pshuai.yin@gmail.com

#14
Title: Local Estimation of the Degree of Optic Disc Swelling from Color Fundus Photography
Authors: Samuel S. Johnson, Jui-Kai Wang, Mohammad Shafkat Islam, Matthew J. Thurtell, Randy H. Kardon, Mona K. Garvin
Email: sam-johnson@uiowa.edu
20 SEPTEMBER SATELLITE EVENTS

#15
Title: Visual Field based Automatic Diagnosis of Glaucoma Using Deep Convolutional Neural Network
Authors: Fei Li, Zhe Wang, Guoxiang Qu, Yu Qiao, Xiulan Zhang
Email: 283630360@qq.com

#16
Title: Towards standardization of retinal vascular measurements: on the effect of image centering
Authors: Muthu Rama Krishnan Mookiah, Sarah McGrory, Stephen Hogg, Jackie Price, Rachel Forster, Thomas J. MacGillivray, Emanuele Trucco
Email: m.r.k.mookiah@dundee.ac.uk

#17
Title: Feasibility study of Subfoveal Choroidal Thickness Changes in Spectral-Domain Optical Coherence Tomography Measurements of Macular Telangiectasia Type 2
Authors: Ronchetti Tiziano, Maloca Peter, Emanuel Ramos de Carvalho, Tjebo F. C. Heeren, Konstantinos Balaskas, Adnan Tufail, Catherine Egan, Mali Okada, Orgül Selim, Jud Christoph, Cattin Philippe
Email: Tiziano.Ronchetti@unibas.ch

#18
Title: Segmentation of retinal layers in OCT images of the mouse eye utilizing polarization contrast
Authors: Marco Augustin, Danielle J. Harper, Conrad W. Merkle, Christoph K. Hitzenberger, Bernhard Baumann
Email: marco.augustin@meduniwien.ac.at

#19
Title: Glaucoma Diagnosis from Eye Fundus Images Based on Deep Morphometric Feature Estimation
Authors: Oscar Perdomo, Vincent Andrearczyk, Fabrice Meriaudeau, Henning M"uller, Fabio A. Gonzalez
Email: ojperdomoc@unal.edu.co

#20
Title: 2D Modeling and Correction of Fan-beam Scan Geometry in OCT
Authors: Min Chen, James C. Gee, Jerry L. Prince, Geoffrey K. Aguirre
Email: minchen1@upenn.edu

#21
Title: A Bottom-up Saliency Estimation Approach for Neonatal Retinal Images
Authors: Sharath M Shankaranarayana, Keerthi Ram, Anand Vinekar, Kaushik Mitra, Mohanasankar Sivaprakasam
Email: ee15s050@ee.iitm.ac.in

#22
Title: Automated OCT segmentation and Comparison with Human/Machines
Authors: Philippe Burlina
Email: Philippe.Burlina@jhuapl.edu
ML-CDS’18: MICCAI Workshop on Multimodal Learning for Clinical Decision Support

09:00-9:10 Welcome

09:10-10:00 Invited Speaker: Role of AI Guided Clinical Decision Support in Neurology
Jeremy Slater, M.D., Chief Medical Officer, Alliance Family of Companies, and Professor of Neurology, University of Texas Health Science Center

10:00-10:30 Oral 1: Multi-task Sparse Low-rank Learning for Multi-classification of Parkinson’s Disease
H. Lei, Y. Zhao, B. Lei, Shenzhen University

10:30-11:00 Oral 2: A Multi-Scale Multiple Sclerosis Lesion Change Detection in a Multi-Sequence MRI
M. Cheng, A. Galimzianova, Z. Lesjak, Z. Spiclin, C. B. Lock, D. L. Rubin, Stanford University, and University of Ljubljana

11:00-11:30 Coffee break

11:30-12:00 Oral 3: Integrating deformable modeling with 3D deep neural network segmentation

12:00-12:30 Oral 4: Optic Disc segmentation in Retinal Fundus Images using Fully Convolutional Network and Removal of False-positives Based on Shape Features

12:30-13:00 Panel with experts from academia, clinicians and industry

1:00-1:05 Wrap up

SaMBa: Sipaim-Miccai Biomedical Workshop

Session Chairs: Natasha Lepore and Jorge Brieva

15:00-15:45 TBD
Eduardo Romero, Universidad Nacional de Colombia

15:45 – 16:30 Imaging-Based Solutions to Health Care Problems in Low Income Environments
Roberto Lavarello, Pontificia Universidad Católica del Perú
20 SEPTEMBER SATELLITE EVENTS

16:30-16:30  **Coffee break**

17:00-18:00  **Panel session: Research and collaboration opportunities in and with Latin America**

**Panelists:**
Ignacio Larrabide, Universidad Nacional del Centro de la Provincia de Buenos Aires, Argentina
Angel Cruz-Roa, University of Los Llanos, Colombia
Leticia Rittner, University of Campinas, Campinas, Brazil
Gustavo Carneiro, University of Adelaide, Adelaide, Australia

**Moderator:**
Daniel Racoceanu-Pontifical Catholic University of Peru

18:00-19:00  **SaMBa poster presentations**

**Papers:**
Andrea Loddo, Cecilia Di Ruberto, Michel Kocher and Guy Prod’Hom, "MP-IDB: The Malaria Parasite image database for image processing and analysis"

Sarada Dakua, Julien Abinahed, Abdulla Al-Ansari, Pablo Bermejo, Ayman Zakaria, Abbes Amira and Faycal Bensaali, "A Method Towards Cerebral Aneurysm Detection in Clinical Settings".

Darwin Díaz, Germán Corredor, Eduardo Romero and Angel Cruz-Roa, "Web-based telepathology for teaching and research in Latin America".

João Mauricio Rosario, Renato Suekichi Kuteken and Rayanne Floriano Batista, "Gait Generation Strategy Based on Cognitive Algorithms".

Camilo Cáceres, João Mauricio Rosario and Dario Amaya, "Proposal of a Smart Hospital based on Internet of Things (IoT) Concept".


Dmytro Kotsur, Roman Yakobenchuk, Rudolf Leube, Reinhard Windoffer and Julian Mattes, "An algorithm for individual intermediate filament tracking".

Jully González, Ángelica Atehortúa, Ricardo Moncayo and Eduardo Romero, "Ocular Control Characterization of Motor Disabilities: the Cerebral Palsy Case".

Joohi Chauhan, Rahul Goswami and Puneet Goyal, "Using Deep Learning to Classify Burnt Body Parts Images for Better Burns Diagnosis".


Cristian Barrera, Germán Corredor, Sunny Alfonso, Andrés Mosquera and Eduardo Romero, "An automatic segmentation of gland nuclei in gastric cancer based on local and contextual information".

Halim Benhabiles, Karim Hammoudi, Feryal Windal, Mahmoud Melkemi and Adnane Cabani, "A Transfer Learning exploited for Indexing Protein Structures from 3D Point Clouds".

Miguel Guevara, Zhong Yi Sun, Pamela Guevara, Denis Rivière, Cyril Poupon and Jean-François Mangin, "Identification of U-bundles based on sulcus morphology".

BIVPCS 2018-MICCAI 2018 Workshop on Bio-Imaging and Visualization for Patient-Customized Simulations

Organizers: João Manuel R. S. Tavares and Shuo Li
Thursday, 9:45 – 12:45, 20 September 2018; Asterisk Indicates Presenting Authors.

09:45-10:00 Opening Remarks & Announcements
Oral Presentation I (2 Talks)

10:00-11:00 A novel interventional guidance framework for transseptal puncture in left atrial interventions
Pedro Morais, João L. Vilaça, Sandro Queirós, Pedro L. Rodrigues, João Manuel R. S. Tavares*, Jan D’hooge

Holographic visualisation and interaction of fused CT, PET and MRI volumetric medical imaging data using dedicated remote GPGPU ray casting
Magali Froehlich*, Christophe Bolinhas, Adrien Depeursinge, Antoine Widmer, Nicolas Chevrey, Patric Hagmann, Christian Simon, Vivianne B C Kokje, Stéphane Gobron

11:00-11:30 Coffee Break

Oral Presentation II (2 Talks)

11:30-12:30 Mr. Silva and Patient Zero: a medical social network and data visualization information system
Patricia C.T. Gonçalves*, Ana S. Moura, M. Natália D.S. Cordeiro, Pedro Campos
Fully Convolutional Network-based Eyeball Segmentation from Sparse Annotation for Eye Surgery Simulation Model
Takaaki Sugino*, Holger R. Roth, Masahiro Oda, Kensaku Mori1

12:30-12:45 Award Announcement, Panel Discussion, and End of Session

Patch-MI: 4th International Workshop on Patch-based Techniques in Medical Imaging

13:30-15:00 Lunch / Poster session

15:00-15:10 Opening remarks

15:10-15:45 Keynote speaker 1
Bennett Landman

15:45-16:30 Oral session 1
(1) Paper 2: Carles Ventura, Iterative Deep Retinal Topology Extraction
(2) Paper 6: Lee Reid, MRI Denoising and Artefact Removal using Self-Organizing Maps for Fast Global Block-Matching
(3) Paper 8: Fan Zhang, Liver Tissue Classification using an Auto-context-based Deep Neural Network with a Multi-phase Training Framework

16:30-17:00 Coffee break / Poster session

17:00-17:35 Keynote speaker 2
Marc Niethammer

17:35-18:20 Oral session 2
(4) Paper 9: Sandra González-Villà, Multi-atlas Parcellation in the Presence of Lesions: Application to Multiple Sclerosis
(5) Paper 11: Dario Augusto Borges Oliveira, Using 1D Patch-Based Signatures for Efficient Cascaded Classification of Lung Nodules
(6) Paper 15: Min-Gyu Park, Stereo Matching for Wireless Capsule Endoscopy using Direct Attenuation Model

18:20-18:30 Closing remarks and best paper award
### CHALLENGES

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>MoNuSeg: Multi-Organ Histopathology Nucleus Segmentation Challenge for H&amp;E Stained Images 2018</strong></td>
<td>The daily program will be announced at the satellite event’s website by organizers.</td>
</tr>
<tr>
<td><strong>MSD: Medical Segmentation Decathlon</strong></td>
<td>The daily program will be announced at the satellite event’s website by organizers.</td>
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