Lecture Notes in Computer Science 11764

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Medical Image Computing and Computer Assisted Intervention – MICCAI 2019

22nd International Conference
Shenzhen, China, October 13–17, 2019
Proceedings, Part I

Springer

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ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-030-32238-0 ISBN 978-3-030-32239-7 (eBook)
https://doi.org/10.1007/978-3-030-32239-7

LNCS Sublibrary: SL6 – Image Processing, Computer Vision, Pattern Recognition, and Graphics

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

We are pleased to present the proceedings for the 22nd International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), which was held at the InterContinental Hotel, Shenzhen, China, October 13–17, 2019. The conference also featured 34 workshops, 13 tutorials, and 22 challenges held on October 13 or 17. MICCAI 2019 had an approximately 63% increase in submissions and accepted papers compared with MICCAI 2018. These papers, which comprise six volumes of *Lecture Notes in Computer Science* (LNCS) proceedings, were selected after a thorough double-blind peer-review process. Following the example set by the previous program chairs of MICCAI 2018 and 2017, we employed Microsoft's Conference Managing Toolkit (CMT) for paper submissions and double-blind peer-reviews, and the Toronto Paper Matching System (TPMS) to assist with automatic paper assignment to area chairs and reviewers.

From 2625 original intentions to submit, 1809 full submissions were received and sent out to peer-review. Of these, 63% were considered as pure Medical Image Computing (MIC), 5% as pure Computer-Assisted Interventions (CAI), and 32% as both MIC and CAI. The MICCAI 2019 Program Committee (PC) comprised 69 area chairs, with 25 from the Americas, 21 from Europe, and 23 from Asia/Pacific/Middle East. Each area chair was assigned $\sim$25 manuscripts, with up to 15 suggested potential reviewers using TPMS scoring and self-declared research areas. Subsequently, over 1200 invited reviewers were asked to bid for the papers for which they had been suggested. Final reviewer allocations via CMT took account of PC suggestions, reviewer bidding, and TPMS scores, finally allocating 5–6 papers per reviewer. Based on the double-blinded reviews, 306 papers (17%) were accepted immediately, and 920 papers (51%) were rejected, with the remainder being sent for rebuttal. These decisions were confirmed by the area chairs. During the rebuttal phase, two additional area chairs were assigned to each rebuttal paper using CMT and TPMS scores, who then independently scored them to accept or reject, based on the reviews, rebuttal, and manuscript, resulting in clear paper decisions using majority voting. This process resulted in the acceptance of further 234 papers for an overall acceptance rate of 30%. Regional PC teleconferences were held in late June to confirm the final results and collect PC feedback on the peer-review process.

For the MICCAI 2019 proceedings, 538 accepted papers have been organized in six volumes as follows:

Part I, LNCS Volume 11764: Optical Imaging; Endoscopy; Microscopy
Part II, LNCS Volume 11765: Image Segmentation; Image Registration; Cardiovascular Imaging; Growth, Development, Atrophy, and Progression
Part III, LNCS Volume 11766: Neuroimage Reconstruction and Synthesis; Neuroimage Segmentation; Diffusion-Weighted Magnetic Resonance Imaging; Functional Neuroimaging (fMRI); Miscellaneous Neuroimaging

Part IV, LNCS Volume 11767: Shape; Prediction; Detection and Localization; Machine Learning; Computer-Aided Diagnosis; Image Reconstruction and Synthesis
Part V, LNCS Volume 11768: Computer-Assisted Interventions; MIC Meets CAI
Part VI, LNCS Volume 11769: Computed Tomography; X-ray Imaging

We would like to thank everyone who contributed to the success of MICCAI 2019 and the quality of its proceedings, particularly the MICCAI Society for support, insightful comments, and providing funding for Kitty Wong to be the ongoing Conference System Manager. Given the increase in workload for this year's meeting, the Program Committee simply could not have functioned effectively without her, and she will provide ongoing oversight of the review process for future MICCAI conferences. Without the dedication and support of all of the organizers of the workshops, tutorials, and challenges, under the guidance of Kenji Suzuki, together with satellite event chairs Hongen Liao, Qian Wang, Luping Zhou, Hayit Greenspan, and Bram van Ginneken, none of these peripheral events would have been feasible.

Also, the Industry Forum (led by Xiaodong Tao and Yiqiang Zhan), the Industry Session (led by Sean Zhou), as well as the Doctoral Symposium (led by Junzhou Huang and Dajiang Zhu) brought new events to MICCAI 2019. The publication chairs, Li Wang and Gang Li, undertook the onerous task of assembling the camera-ready proceedings for publication by Springer.

Behind the scenes, MICCAI secretariat personnel, Janette Wallace and Johanne Langford, kept a close eye on logistics and budgets, while Doris Lam and her team from Momentous Asia, this year's Professional Conference Organization, along with the Local Organizing Committee chair, Dong Ni (together with Jing Qin, Qianjin Feng, Dong Liang, Xiaoying Tang), handled the website and local organization. The Student Travel Award Committee chaired by Huiguang He, Jun Shi, and Xi Jiang evaluated numerous applications, including awards for undergraduate students, which is new in the history of MICCAI. We also thank our sponsors for their financial support and presence on site. We are especially grateful to all members of the Program Committee for their diligent work in the reviewer assignments and final paper selection, as well as the reviewers for their support during the entire process. Finally, and most importantly, we thank all authors, co-authors, students/postdocs, and supervisors, for submitting and presenting their high-quality work that made MICCAI 2019 a greatly enjoyable, informative, and successful event. We are indebted to those reviewers and PC members who helped us resolve issues relating to last-minute missing reviews. Overall, we thank all of the authors and attendees for making MICCAI 2019 a spectacular success. We look forward to seeing you in Lima, Peru at MICCAI 2020!

October 2019

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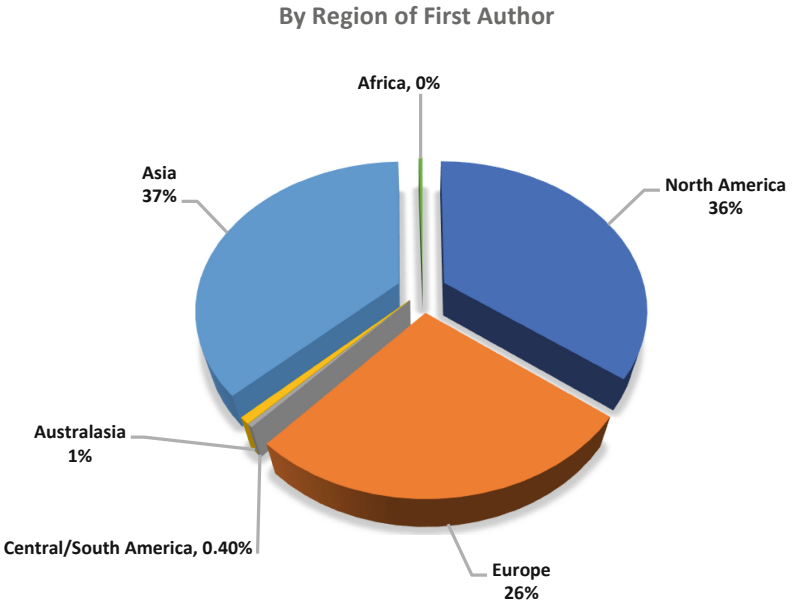
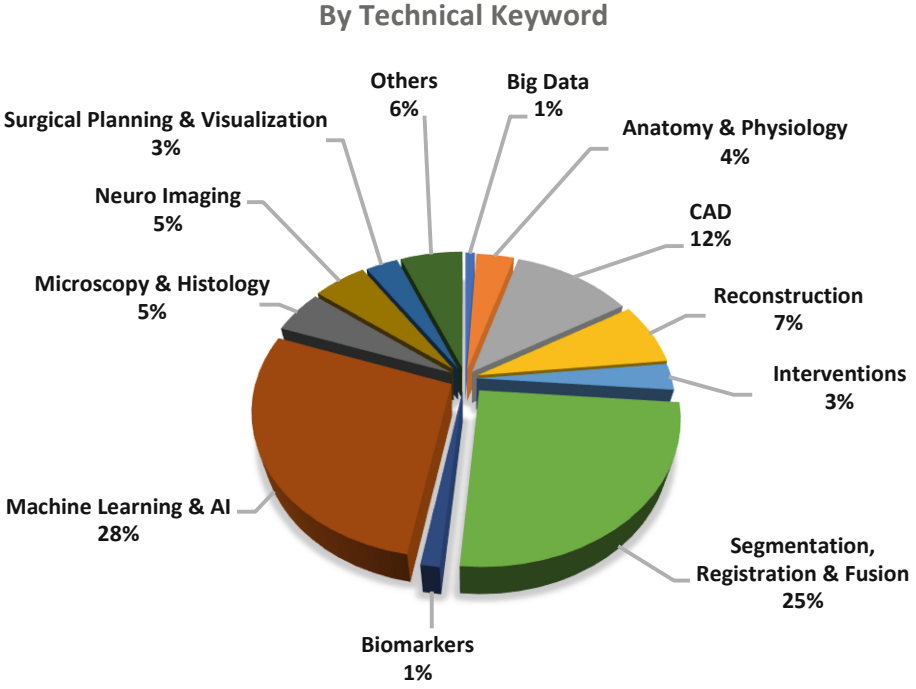
Accepted MICCAI 2019 Papers





Awards Presented at MICCAI 2018, Granada, Spain

MICCAI Society Enduring Impact Award: The Enduring Impact Award is the highest award of the MICCAI Society. It is a career award for continued excellence in the MICCAI research field. The 2018 Enduring Impact Award was presented to Sandy Wells, Brigham and Women's Hospital/Harvard Medical School, USA.

MICCAI Society Fellowships: MICCAI Fellowships are bestowed annually on a small number of senior members of the society in recognition of substantial scientific contributions to the MICCAI research field and service to the MICCAI community. In 2018, fellowships were awarded to:

- Pierre Jannin (Université de Rennes, France)
- Anne Martel (University of Toronto, Canada)
- Julia Schnabel (King's College London, UK)

Medical Image Analysis Journal Award Sponsored by Elsevier: Jianyu Lin, for his paper entitled "Dual-modality Endoscopic Probe for Tissue Surface Shape Reconstruction and Hyperspectral Imaging Enabled by Deep Neural Networks," authored by Jianyu Lin, Neil T. Clancy, Ji Qi, Yang Hu, Taran Tatla, Danail Stoyanov, Lena Maier-Hein, and Daniel S. Elson.

Best Paper in *International Journal of Computer-Assisted Radiology and Surgery* (IJCARS) journal: Arash Pourtaherian for his paper entitled "Robust and Semantic Needle Detection in 3D Ultrasound Using Orthogonal-Plane Convolutional Neural Networks," authored by Arash Pourtaherian, Farhad Ghazvinian Zanjani, Svitlana Zinger, Nenad Mihajlovic, Gary C. Ng, Hendrikus H. M. Korsten, and Peter H. N. de With.

Young Scientist Publication Impact Award: MICCAI papers by a young scientist from the past 5 years were eligible for this award. It is made to a researcher whose work had an impact on the MICCAI field in terms of citations, secondary citations, subsequent publications, h-index. The 2018 Young Scientist Publication Impact Award was given to Holger R Roth: "A New 2.5D Representation for Lymph Node Detection Using Random Sets of Deep Convolutional Neural Network Observations" authored by Holger R. Roth, Le Lu, Ari Seff, Kevin M. Cherry, Joanne Hoffman, Shijun Wang, Jiamin Liu, Evrim Turkbey, and Ronald M. Summers.

MICCAI Young Scientist Awards: The Young Scientist Awards are stimulation prizes awarded for the best first authors of MICCAI contributions in distinct subject areas. The nominees had to be full-time students at a recognized university at, or within, two years prior to submission. The 2018 MICCAI Young Scientist Awards were given to:

- Erik J. Bekkers for the paper entitled: "Roto-Translation Covariant Convolutional Networks for Medical Image Analysis"
- Bastian Bier for the paper entitled: "X-ray-transform Invariant Anatomical Landmark Detection for Pelvic Trauma Surgery"

- Yuanhan Mo for his paper entitled: “The Deep Poincaré Map: A Novel Approach for Left Ventricle Segmentation”
- Tanya Nair for the paper entitled: “Exploring Uncertainty Measures in Deep Networks for Multiple Sclerosis Lesion Detection and Segmentation”
- Yue Zhang for the paper entitled: “Task-Driven Generative Modeling for Unsupervised Domain Adaptation: Application to X-ray Image Segmentation”

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