

International Conference on Medical Imaging with Deep Learning

Volume 172



Ender Konukoglu, Bjoern Menze, Archana Venkataraman,

Christian F. Baumgartner, Qi Dou, and Shadi Albarqouni

Preface

This volume contains the Proceedings of the Fifth International Conference on Medical Imaging with Deep Learning – MIDL 2022. The conference was organized jointly by ETH Zürich and the University of Zürich, Switzerland, with a team of program chairs from Johns Hopkins University, USA, University of Tübingen, Germany, The Chinese University of Hong Kong, China, and University of Bonn/Helmholtz AI, Germany. The conference was held between July 6 and 8, 2022, in Zürich.

MIDL 2022 attracted world-class researchers, scientists, engineers, as well as clinicians, who are interested in developing novel algorithms solving medical imaging problems using deep learning techniques. The conference had two submission tracks: *full paper* and *short paper*. Through the OpenReview system, 198 full paper and 142 short paper submissions were received. For both tracks, the review process was single blind by default but the authors were also given the option to keep their identities anonymous. All submitted papers were available on the OpenReview system from the time of their submission. All reviews and rebuttals were made publicly available after the decision process. However, authors were given the option of removing their rejected submissions from the system.

For the full paper track, the review process was initiated by the Program Chairs (PC), and was handled by one primary Area Chair (AC) for each paper. The AC assigned three expert reviewers, whose identities were kept anonymous. The AC assigned ten candidate reviewers per paper, upon which a matching algorithm assigned three reviewers per paper taking AC preference, reviewer preference, and reviewer expertise on the topic of the paper into account. After all reviews and rebuttals, for full papers, were received, area chairs wrote an additional metareview and provided their recommendation to accept or reject based on the submission. The final acceptance rate of the full paper track is 49.5% (98/198). Among the 98 accepted full paper articles, 23 were selected as oral presentations (11.6% of all submissions), based on reviewer and AC proposals, and 75 for poster presentations. Among the 153 submitted short papers, 107 were accepted as posters with short oral teasers. The final acceptance rate of the short paper track is 69.9% (107/153). The proceedings of machine learning research (PMLR) only contains the accepted full paper submissions, the short papers can be found in the OpenReview system. Furthermore, 20 papers – selected from the full paper submissions – were recommended for submitting an extended version of their work in a special issue of Medical Image Analysis.

Acknowledging the benefits of sharing novel ideas at their infancy, at MIDL 2022, short paper submissions were reviewed with a more lightweight process by ACs, whose identities were kept anonymous. The focus of the review was put on the potential for encouraging constructive and thought-provoking discussions at the conference. The acceptance rate for the short paper track was kept higher than for the full papers to encourage a wide representation of the field.

The articles in these proceedings are presented in alphabetical order by first author names. The papers are comprised of a wide range of topics including new deep learning architectures, self-supervised representation learning, geometric learning, domain adaptation, and applications to lesion segmentation, brain imaging, cardiac imaging, and image reconstruction.

PREFACE

The PC and organizing chairs would like to thank the OpenReview staff for their support in hosting the submission site and PMLR staff for their support in finalizing these proceedings.

Most importantly, we would like to thank our Area Chairs, and Reviewers for their hard work in preparing and helping us shape the final technical program of MIDL 2022. The conference and the current proceedings are a result of their work.

Finally, we would like to thank all our sponsors for the financial support, which made the MIDL 2022 conference possible.

October 17, 2022

The Editorial Team:

Ender Konukoglu
ETH Zürich, Switzerland
ender.konukoglu@vision.ee.ethz.ch

Bjoern Menze
University of Zürich, Switzerland
bjoern.menze@uzh.ch

Archana Venkataraman
Johns Hopkins University, USA
archana.venkataraman@jhu.edu

Christian F. Baumgartner
University of Tübingen, Germany
christian.baumgartner@uni-tuebingen.de

Qi Dou
The Chinese University of Hong Kong, China
qidou@cuhk.hk.edu

Shadi Albarqouni
University of Bonn&Helmholtz AI, Germany
shadi.albarqouni@tum.de

Area Chairs Adrian V. Dalca, Adrien Depeursinge, Andrew P. King, Carole Frindel, Caroline Petitjean, Dwarikanath Mahapatra, Enzo Ferrante, Emma Claire Robinson, Francesco Ciompi, Guang Yang, Huazhu Fu, Ilker Hacihaliloglu, Ingerid Reinertsen, Ismail Ben Ayed, Jelmer M. Wolterink, Hao Chen, Jianming Liang, Juan Eugenio Iglesias, Jonas Richiardi, Jose Dolz, Konstantinos Kamnitsas, Baiying Lei, Lisa M. Koch, Mathias Unberath, Minjeong Kim, Nicha C. Dvornek, Niron Burgos, Pierrick Coupe, Ryutaro Tanno, Sandy Engelhardt, Sila Kurugol, Veronika Cheplygina, Xiahai Zhuang

Recognition of Outstanding Reviewers Adrian Galdran, Hristina Uzunova, Juan Carlos Prieto, Katharina Breininger, M. Jorge Cardoso, Mattias P. Heinrich, Melanie Ganz, Umang Gupta

Reviewers Abdulah Fawaz, Alaa Bessadok, Alaa Sami Alzoubi, Alberto Gomez, Aldo Zaimi, Alessa Hering, Alessandro Casella, Alexander John Robertson Campbell, Alexis Arnaudon, Amine Amyar, Amirreza Mahbod, Ana I. L. Namburete, Andreas M Kist, Anirban Mukhopadhyay, Antoine Theberge, Arinbjörn Kolbeinsson, Arrate Muñoz-Barrutia, Bennett A. Landman, Bernhard Kainz, Bishesh Khanal, Bokai Zhang, Bram van Ginneken, Caizi Li, Camila Gonzalez, Carole H. Sudre, Carole Lartizien, Carolin Pirkl, Cem M Deniz, Chao Chen, Chao Feng, Cheng Chen, Chenyu You, Christian Desrosiers, Christof Seiler, Chuyang Ye, Clara I. Sánchez, Colin Jacobs, Cristian Lorenz, Daniel Hyungseok Pak, David Edmundo Romo-Bucheli, David Kügler, David Zimmerer, Dmitrii Lachinov, Dominik Mairhöfer, Duygu Tosun, Dzung Pham, Elsa Angelini, Ertunc Erdil, Erwan Kerrien, Esther E. Bron, Estibaliz Gómez de Mariscal, Fatmatulzehra Uslu, Fazael Ayatollahi, Francesco Caliva, Gary E Christensen, German Gonzalez, Guotai Wang, Hang Zhang, Hans Meine, Hao Zheng, Harini Veeraraghavan, Harshita Sharma, Henning Kost, Heung-II Suk, Hoel Kervadec, Hongrun Zhang, Hongwei Bran Li, Hrishikesh Deshpande, Hua Ma, Hugo Kuijf, Hyungjin Chung, Ivan Ezhov, Ivor Simpson, Jana Hutter, Jannis Hagenah, Jaime Banus, Jens Petersen, Jeppe Thagaard, Jerry L. Prince, Jia-Xing Zhong, Jinwei Zhang, John A Onofrey, John Anderson Garcia Henao, Joseph Paul Cohen, Jue Jiang, Juntang Zhuang, Justin Haldar, Kangning Liu, Ke Yuan, Keelin Murphy, Khrystyna Faryna, Klaus Eickel, Klaus Maier-Hein, Krishna Chaitanya, Lalith Sharan, Linwei Wang, Louis van Harten, Lukas Fischer, Malte Hoffmann, Manan Lalit, Marc Aubreville, Maria A Zuluaga, Marijn F. Stollenga, Mark S Graham, Martin Andreas Styner, Matteo Dunnhofer, Matthan W. A. Caan, Matthew C.H. Lee, Matthew Toews, Max-Heinrich Laves, Michele Svanera, Mickael Tardy, Mitko Veta, Mobarakol Islam, Moo K. Chung, Nalini M. Singh, Navchetan Awasthi, Neel Dey, Neeraj Kumar, Neerav Karani, Nicolas Duchateau, Nikolas Lessmann, Nils Gessert, Odyssée Merveille, Olivier Salvado, Pauline Mouches, Pengcheng Li, Philipp Gruening, Pierre-louis Bazin, Pietro Gori, Prateek Prasanna, Pulkit Khandelwal Pushpak Pati, Qian He, Raghav Mehta, Raghavendra Selvan, Raphael Prevost, Rasmus Reinhold Paulsen, René Werner, Reyer Zwiggelaar Reza Abbasi-Asl, Robert J. Puzniak, Roberto Souza, Rodney LaLonde, Rongguang Wang, Rosana EL Jurdi, Roxane Licandro, Sanne G.M. van Velzen, Saypraseuth Mounsaveng, Shikhar Srivastava, Shiv Gehlot, Shujun Wang, Silas Nyboe Ørting, Siyu Shi, Sobhan Hemati, Stephan Dooper, Sumedha Singla, Thomas van den Heuvel, Tian Xia, Ulas Bagci, Veronica Ravano, Veronika A. Zimmer, Vincent Andrearczyk, Vincent Martin Vigneron, Vishwa Sanjay Parekh, Xiaobin Hu, Xiaoling Hu, Xiaoran Chen, Xiaoxiao Li, Yanda Meng, Yash Sharma, Yashbir Singh, Yi Hao Chan, Yichi Zhang, Zongwei Zhou