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Medical Image Computing and Computer Assisted Intervention – MICCAI 2020

23rd International Conference
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Proceedings, Part II



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Preface

The 23rd International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI 2020) was held this year under the most unusual circumstances, due to the COVID-19 pandemic disrupting our lives in ways that were unimaginable at the start of the new decade. MICCAI 2020 was scheduled to be held in Lima, Peru, and would have been the first MICCAI meeting in Latin America. However, with the pandemic, the conference and its program had to be redesigned to deal with realities of the “new normal”, where virtual presence rather than physical interactions among attendees, was necessary to comply with global transmission control measures. The conference was held through a virtual conference management platform, consisting of the main scientific program in addition to featuring 25 workshops, 8 tutorials, and 24 challenges during October 4–8, 2020. In order to keep a part of the original spirit of MICCAI 2020, SIPAIM 2020 was held as an adjacent LatAm conference dedicated to medical information management and imaging, held during October 3–4, 2020.

The proceedings of MICCAI 2020 showcase papers contributed by the authors to the main conference, which are organized in seven volumes of *Lecture Notes in Computer Science* (LNCS) books. These papers were selected after a thorough double-blind peer-review process. We followed the example set by past MICCAI meetings, using Microsoft’s Conference Managing Toolkit (CMT) for paper submission and peer reviews, with support from the Toronto Paper Matching System (TPMS) to partially automate paper assignment to area chairs and reviewers.

The conference submission deadline had to be extended by two weeks to account for the disruption COVID-19 caused on the worldwide scientific community. From 2,953 original intentions to submit, 1,876 full submissions were received, which were reduced to 1,809 submissions following an initial quality check by the program chairs. Of those, 61% were self-declared by authors as Medical Image Computing (MIC), 6% as Computer Assisted Intervention (CAI), and 32% as both MIC and CAI. Following a broad call to the community for self-nomination of volunteers and a thorough review by the program chairs, considering criteria such as balance across research areas, geographical distribution, and gender, the MICCAI 2020 Program Committee comprised 82 area chairs, with 46% from North America, 28% from Europe, 19% from Asia/Pacific/Middle East, 4% from Latin America, and 1% from Australia. We invested significant effort in recruiting more women to the Program Committee, following the conference’s emphasis on equity, inclusion, and diversity. This resulted in 26% female area chairs. Each area chair was assigned about 23 manuscripts, with suggested potential reviewers using TPMS scoring and self-declared research areas, while domain conflicts were automatically considered by CMT. Following a final revision and prioritization of reviewers by area chairs in terms of their expertise related to each paper,

over 1,426 invited reviewers were asked to bid for the papers for which they had been suggested. Final reviewer allocations via CMT took account of reviewer bidding, prioritization of area chairs, and TPMS scores, leading to allocating about 4 papers per reviewer. Following an initial double-blind review phase by reviewers, area chairs provided a meta-review summarizing key points of reviews and a recommendation for each paper. The program chairs then evaluated the reviews and their scores, along with the recommendation from the area chairs, to directly accept 241 papers (13%) and reject 828 papers (46%); the remainder of the papers were sent for rebuttal by the authors. During the rebuttal phase, two additional area chairs were assigned to each paper using the CMT and TPMS scores while accounting for domain conflicts. The three area chairs then independently scored each paper 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 a further 301 papers for an overall acceptance rate of 30%. A virtual Program Committee meeting was held on July 10, 2020, to confirm the final results and collect feedback of the peer-review process.

For the MICCAI 2020 proceedings, 542 accepted papers have been organized into seven volumes as follows:

- Part I, LNCS Volume 12261: Machine Learning Methodologies
- Part II, LNCS Volume 12262: Image Reconstruction and Machine Learning
- Part III, LNCS Volume 12263: Computer Aided Intervention, Ultrasound and Image Registration
- Part IV, LNCS Volume 12264: Segmentation and Shape Analysis
- Part V, LNCS Volume 12265: Biological, Optical and Microscopic Image Analysis
- Part VI, LNCS Volume 12266: Clinical Applications
- Part VII, LNCS Volume 12267: Neurological Imaging and PET

For the main conference, the traditional emphasis on poster presentations was maintained; each author uploaded a brief pre-recorded presentation and a graphical abstract onto a web platform and was allocated a personal virtual live session in which they talked directly to the attendees. It was also possible to post questions online allowing asynchronous conversations – essential to overcome the challenges of a global conference spanning many time zones. The traditional oral sessions, which typically included a small proportion of the papers, were replaced with 90 “mini” sessions where all of the authors were clustered into groups of 5 to 7 related papers; a live virtual session allowed the authors and attendees to discuss the papers in a panel format.

We would like to sincerely thank everyone who contributed to the success of MICCAI 2020 and the quality of its proceedings under the most unusual circumstances of a global pandemic. First and foremost, we thank all authors for submitting and presenting their high-quality work that made MICCAI 2020 a greatly enjoyable and successful scientific meeting. We are also especially grateful to all members of the Program Committee and reviewers for their dedicated effort and insightful feedback throughout the entire paper selection process. We would like to particularly thank the MICCAI society for support, insightful comments, and continuous engagement with organizing the conference. Special thanks go to Kitty Wong, who oversaw the entire

process of paper submission, reviews, and preparation of conference proceedings. Without her, we would have not functioned effectively. Given the “new normal”, none of the workshops, tutorials, and challenges would have been feasible without the true leadership of the satellite events organizing team led by Mauricio Reyes: Erik Meijering (workshops), Carlos Alberola-López (tutorials), and Lena Maier-Hein (challenges). Behind the scenes, MICCAI secretarial personnel, Janette Wallace and Johanne Langford, kept a close eye on logistics and budgets, while Mehmet Eldegez and his team at Dekon Congress and Tourism led the professional conference organization, working tightly with the virtual platform team. We also thank our sponsors for financial support and engagement with conference attendees through the virtual platform. Special thanks goes to Veronika Cheplygina for continuous engagement with various social media platforms before and throughout the conference to publicize the conference. We would also like to express our gratitude to Shelley Wallace for helping us in Marketing MICCAI 2020, especially during the last phase of the virtual conference organization.

The selection process for Young Investigator Awards was managed by a team of senior MICCAI investigators, led by Julia Schnabel. In addition, MICCAI 2020 offered free registration to the top 50 ranked papers at the conference whose primary authors were students. Priority was given to low-income regions and Latin American students. Further support was provided by the National Institutes of Health (support granted for MICCAI 2020) and the National Science Foundation (support granted to MICCAI 2019 and continued for MICCAI 2020) which sponsored another 52 awards for USA-based students to attend the conference. We would like to thank Marius Linguraru and Antonion Porras, for their leadership in regards to the NIH sponsorship for 2020, and Dinggang Shen and Tianming Liu, MICCAI 2019 general chairs, for keeping an active bridge and engagement with MICCAI 2020.

Marius Linguraru and Antonion Porras were also leading the young investigators early career development program, including a very active mentorship which we do hope, will significantly catalyze young and brilliant careers of future leaders of our scientific community. In link with SIPAIM (thanks to Jorge Brieva, Marius Linguraru, and Natasha Lepore for their support), we also initiated a Startup Village initiative, which, we hope, will be able to bring in promising private initiatives in the areas of MICCAI. As a part of SIPAIM 2020, we note also the presence of a workshop for Peruvian clinicians. We would like to thank Benjamini Castañeda and Renato Gandolfi for this initiative.

MICCAI 2020 invested significant efforts to tightly engage the industry stakeholders in our field throughout its planning and organization. These efforts were led by Parvin Mousavi, and ensured that all sponsoring industry partners could connect with the conference attendees through the conference’s virtual platform before and during the meeting. We would like to thank the sponsorship team and the contributions

of Gustavo Carneiro, Benjamín Castañeda, Ignacio Larrabide, Marius Linguraru, Yanwu Xu, and Kevin Zhou.

We look forward to seeing you at MICCAI 2021.

October 2020

Anne L. Martel

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Sangmin Lee	Libin Liang
Soochahn Lee	Shanshan Liang
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Wee Kheng Leow	Huei-Yung Lin
Annan Li	

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Mikhail Milchenko
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Zhe Min
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Hassan Mohy-ud-Din
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Mohammad Hamed Mozaffari
Anirban Mukhopadhyay
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Cosmas Mwikirize
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Ahmed Naglah
Vivek Natarajan
Vishwesh Nath
Rodrigo Nava
Fernando Navarro
Lydia Neary-Zajiczeck
Peter Neher
Dominik Neumann
Gia Ngo
Hannes Nickisch
Dong Nie
Jingxin Nie
Weizhi Nie
Aditya Nigam
Xia Ning
Zhenyuan Ning
Sijie Niu
Tianye Niu
Alexey Novikov
Jorge Novo
Chinedu Nwoye
Mohammad Obeid
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Jimena Olveres
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Tengda Zhao	Wentao Zhu
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Hao Zheng	Yukai Zou
Jiannan Zheng	Gerald Zwettler
Kang Zheng	Reyer Zwiggelaar

Contents – Part II

Image Reconstruction

Improving Amide Proton Transfer-Weighted MRI Reconstruction Using T2-Weighted Images	3
<i>Puyang Wang, Pengfei Guo, Jianhua Lu, Jinyuan Zhou, Shanshan Jiang, and Vishal M. Patel</i>	
Compressive MR Fingerprinting Reconstruction with Neural Proximal Gradient Iterations	13
<i>Dongdong Chen, Mike E. Davies, and Mohammad Golbabaei</i>	
Active MR k -space Sampling with Reinforcement Learning	23
<i>Luis Pineda, Sumana Basu, Adriana Romero, Roberto Calandra, and Michal Drozdal</i>	
Fast Correction of Eddy-Current and Susceptibility-Induced Distortions Using Rotation-Invariant Contrasts	34
<i>Sahar Ahmad, Ye Wu, Khoi Minh Huynh, Kim-Han Thung, Weili Lin, Dinggang Shen, and Pew-Thian Yap</i>	
Joint Reconstruction and Bias Field Correction for Undersampled MR Imaging	44
<i>Mélanie Gaillochet, Kerem Can Tezcan, and Ender Konukoglu</i>	
Joint Total Variation ESTATICS for Robust Multi-parameter Mapping	53
<i>Yaël Balbastre, Mikael Brudfors, Michela Azzarito, Christian Lambert, Martina F. Callaghan, and John Ashburner</i>	
End-to-End Variational Networks for Accelerated MRI Reconstruction	64
<i>Anuroop Sriram, Jure Zbontar, Tullie Murrell, Aaron Defazio, C. Lawrence Zitnick, Nafissa Yakubova, Florian Knoll, and Patricia Johnson</i>	
3d-SMRnet: Achieving a New Quality of MPI System Matrix Recovery by Deep Learning	74
<i>Ivo M. Baltruschat, Patryk Szwargulski, Florian Griese, Mirco Grosser, Rene Werner, and Tobias Knopp</i>	
MRI Image Reconstruction via Learning Optimization Using Neural ODEs	83
<i>Eric Z. Chen, Terrence Chen, and Shanhui Sun</i>	

An Evolutionary Framework for Microstructure-Sensitive Generalized Diffusion Gradient Waveforms	94
<i>Raphaël Truffet, Jonathan Rafael-Patino, Gabriel Girard, Marco Pizzolato, Christian Barillot, Jean-Philippe Thiran, and Emmanuel Caruyer</i>	
Lesion Mask-Based Simultaneous Synthesis of Anatomic and Molecular MR Images Using a GAN	104
<i>Pengfei Guo, Puyang Wang, Jinyuan Zhou, Vishal M. Patel, and Shanshan Jiang</i>	
T2 Mapping from Super-Resolution-Reconstructed Clinical Fast Spin Echo Magnetic Resonance Acquisitions	114
<i>Hélène Lajous, Tom Hilbert, Christopher W. Roy, Sébastien Tourbier, Priscille de Dumast, Thomas Yu, Jean-Philippe Thiran, Jean-Baptiste Ledoux, Davide Piccini, Patric Hagmann, Reto Meuli, Tobias Kober, Matthias Stuber, Ruud B. van Heeswijk, and Meritxell Bach Cuadra</i>	
Learned Proximal Networks for Quantitative Susceptibility Mapping	125
<i>Kuo-Wei Lai, Manisha Aggarwal, Peter van Zijl, Xu Li, and Jeremias Sulam</i>	
Learning a Gradient Guidance for Spatially Isotropic MRI Super-Resolution Reconstruction	136
<i>Yao Sui, Onur Afacan, Ali Gholipour, and Simon K. Warfield</i>	
Encoding Metal Mask Projection for Metal Artifact Reduction in Computed Tomography	147
<i>Yuanyuan Lyu, Wei-An Lin, Haofu Liao, Jingjing Lu, and S. Kevin Zhou</i>	
Acceleration of High-Resolution 3D MR Fingerprinting via a Graph Convolutional Network	158
<i>Feng Cheng, Yong Chen, Xiaopeng Zong, Weili Lin, Dinggang Shen, and Pew-Thian Yap</i>	
Deep Attentive Wasserstein Generative Adversarial Networks for MRI Reconstruction with Recurrent Context-Awareness	167
<i>Yifeng Guo, Chengjia Wang, Heye Zhang, and Guang Yang</i>	
Learning MRI k -Space Subsampling Pattern Using Progressive Weight Pruning	178
<i>Kai Xuan, Shanhui Sun, Zhong Xue, Qian Wang, and Shu Liao</i>	
Model-Driven Deep Attention Network for Ultra-fast Compressive Sensing MRI Guided by Cross-contrast MR Image	188
<i>Yan Yang, Na Wang, Heran Yang, Jian Sun, and Zongben Xu</i>	

Simultaneous Estimation of X-Ray Back-Scatter and Forward-Scatter Using Multi-task Learning	199
<i>Philipp Roser, Xia Zhong, Annette Birkhold, Alexander Preuhs, Christopher Syben, Elisabeth Hoppe, Norbert Strobel, Markus Kowarschik, Rebecca Fahrig, and Andreas Maier</i>	
Prediction and Diagnosis	
MIA-Prognosis: A Deep Learning Framework to Predict Therapy Response	211
<i>Jiancheng Yang, Jiajun Chen, Kaiming Kuang, Tiancheng Lin, Junjun He, and Bingbing Ni</i>	
M ² Net: Multi-modal Multi-channel Network for Overall Survival Time Prediction of Brain Tumor Patients	221
<i>Tao Zhou, Huazhu Fu, Yu Zhang, Changqing Zhang, Xiankai Lu, Jianbing Shen, and Ling Shao</i>	
Automatic Detection of Free Intra-abdominal Air in Computed Tomography	232
<i>Oliver Taubmann, Jingpeng Li, Felix Denzinger, Eva Eibenberger, Felix C. Müller, Mathias W. Brejnebøl, and Andreas Maier</i>	
Prediction of Pathological Complete Response to Neoadjuvant Chemotherapy in Breast Cancer Using Deep Learning with Integrative Imaging, Molecular and Demographic Data	242
<i>Hongyi Duanmu, Pauline Boning Huang, Srinidhi Brahmavar, Stephanie Lin, Thomas Ren, Jun Kong, Fusheng Wang, and Tim Q. Duong</i>	
Geodesically Smoothed Tensor Features for Pulmonary Hypertension Prognosis Using the Heart and Surrounding Tissues	253
<i>Johanna Uthoff, Samer Alabed, Andrew J. Swift, and Haiping Lu</i>	
Ovarian Cancer Prediction in Proteomic Data Using Stacked Asymmetric Convolution	263
<i>Cheng Yuan, Yujin Tang, and Dahong Qian</i>	
DeepPrognosis: Preoperative Prediction of Pancreatic Cancer Survival and Surgical Margin via Contrast-Enhanced CT Imaging	272
<i>Jiawen Yao, Yu Shi, Le Lu, Jing Xiao, and Ling Zhang</i>	
Holistic Analysis of Abdominal CT for Predicting the Grade of Dysplasia of Pancreatic Lesions	283
<i>Konstantin Dmitriev and Arie E. Kaufman</i>	

Feature-Enhanced Graph Networks for Genetic Mutational Prediction Using Histopathological Images in Colon Cancer	294
<i>Kexin Ding, Qiao Liu, Edward Lee, Mu Zhou, Aidong Lu, and Shaoting Zhang</i>	
Spatial-And-Context Aware (SpACe) “Virtual Biopsy” Radiogenomic Maps to Target Tumor Mutational Status on Structural MRI	305
<i>Marwa Ismail, Ramon Correa, Kaustav Bera, Ruchika Verma, Anas Saeed Bamashmos, Niha Beig, Jacob Antunes, Prateek Prasanna, Volodymyr Statsevych, Manmeet Ahluwalia, and Pallavi Tiwari</i>	
CorrSigNet: Learning CORRelated Prostate Cancer SIGnatures from Radiology and Pathology Images for Improved Computer Aided Diagnosis	315
<i>Indrani Bhattacharya, Arun Seetharaman, Wei Shao, Rewa Sood, Christian A. Kunder, Richard E. Fan, Simon John Christoph Soerensen, Jeffrey B. Wang, Pejman Ghanouni, Nikola C. Teslovich, James D. Brooks, Geoffrey A. Sonn, and Mirabela Rusu</i>	
Preoperative Prediction of Lymph Node Metastasis from Clinical DCE MRI of the Primary Breast Tumor Using a 4D CNN.	326
<i>Son Nguyen, Dogan Polat, Paniz Karbasi, Daniel Moser, Liqiang Wang, Keith Hulsey, Murat Can Çobanoğlu, Basak Dogan, and Albert Montillo</i>	
Learning Differential Diagnosis of Skin Conditions with Co-occurrence Supervision Using Graph Convolutional Networks	335
<i>Junyan Wu, Hao Jiang, Xiaowei Ding, Anudeep Konda, Jin Han, Yang Zhang, and Qian Li</i>	
Cross-Domain Methods and Reconstruction	
Unified Cross-Modality Feature Disentangler for Unsupervised Multi-domain MRI Abdomen Organs Segmentation.	347
<i>Jue Jiang and Harini Veeraraghavan</i>	
Dynamic Memory to Alleviate Catastrophic Forgetting in Continuous Learning Settings	359
<i>Johannes Hofmanninger, Matthias Perkonigg, James A. Brink, Oleg Pianykh, Christian Herold, and Georg Langs</i>	
Unlearning Scanner Bias for MRI Harmonisation	369
<i>Nicola K. Dinsdale, Mark Jenkinson, and Ana I. L. Namburete</i>	
Cross-domain Medical Image Translation by Shared Latent Gaussian Mixture Model	379
<i>Yingying Zhu, Youbao Tang, Yuxing Tang, Daniel C. Elton, Sungwon Lee, Perry J. Pickhardt, and Ronald M. Summers</i>	

Self-supervised Skull Reconstruction in Brain CT Images with Decompressive Craniectomy	390
<i>Franco Matzkin, Virginia Newcombe, Susan Stevenson, Aneesh Khetani, Tom Newman, Richard Digby, Andrew Stevens, Ben Glocker, and Enzo Ferrante</i>	
X2Teeth: 3D Teeth Reconstruction from a Single Panoramic Radiograph	400
<i>Yuan Liang, Weinan Song, Jiawei Yang, Liang Qiu, Kun Wang, and Lei He</i>	
Domain Adaptation for Ultrasound Beamforming	410
<i>Jaime Tierney, Adam Luchies, Christopher Khan, Brett Byram, and Matthew Berger</i>	
CDF-Net: Cross-Domain Fusion Network for Accelerated MRI Reconstruction	421
<i>Osvald Nitski, Sayan Nag, Chris McIntosh, and Bo Wang</i>	
Domain Adaptation	
Improve Unseen Domain Generalization via Enhanced Local Color Transformation	433
<i>Jianhao Xiong, Andre Wang He, Meng Fu, Xinyue Hu, Yifan Zhang, Congxin Liu, Xin Zhao, and Zongyuan Ge</i>	
Transport-Based Joint Distribution Alignment for Multi-site Autism Spectrum Disorder Diagnosis Using Resting-State fMRI	444
<i>Junyi Zhang, Peng Wan, and Daoqiang Zhang</i>	
Automatic and Interpretable Model for Periodontitis Diagnosis in Panoramic Radiographs	454
<i>Haoyang Li, Juexiao Zhou, Yi Zhou, Jieyu Chen, Feng Gao, Ying Xu, and Xin Gao</i>	
Residual-CycleGAN Based Camera Adaptation for Robust Diabetic Retinopathy Screening	464
<i>Dalu Yang, Yehui Yang, Tiantian Huang, Binghong Wu, Lei Wang, and Yanwu Xu</i>	
Shape-Aware Meta-learning for Generalizing Prostate MRI Segmentation to Unseen Domains	475
<i>Quande Liu, Qi Dou, and Pheng-Ann Heng</i>	

Automatic Plane Adjustment of Orthopedic Intraoperative Flat Panel Detector CT-Volumes	486
<i>Celia Martín Vicario, Florian Kordon, Felix Denzinger, Markus Weiten, Sarina Thomas, Lisa Kausch, Jochen Franke, Holger Keil, Andreas Maier, and Holger Kunze</i>	
Unsupervised Graph Domain Adaptation for Neurodevelopmental Disorders Diagnosis	496
<i>Bomin Wang, Zhi Liu, Yujun Li, Xiaoyan Xiao, Ranran Zhang, Yankun Cao, Lizhen Cui, and Pengfei Zhang</i>	
JBFnet - Low Dose CT Denoising by Trainable Joint Bilateral Filtering	506
<i>Mayank Patwari, Ralf Gutjahr, Rainer Raupach, and Andreas Maier</i>	
MI ² GAN: Generative Adversarial Network for Medical Image Domain Adaptation Using Mutual Information Constraint	516
<i>Xinpeng Xie, Jiawei Chen, Yuexiang Li, Linlin Shen, Kai Ma, and Yefeng Zheng</i>	
Machine Learning Applications	
Joint Modeling of Chest Radiographs and Radiology Reports for Pulmonary Edema Assessment	529
<i>Geeticka Chauhan, Ruizhi Liao, William Wells, Jacob Andreas, Xin Wang, Seth Berkowitz, Steven Horng, Peter Szolovits, and Polina Golland</i>	
Domain-Specific Loss Design for Unsupervised Physical Training: A New Approach to Modeling Medical ML Solutions	540
<i>Hendrik Burwinkel, Holger Matz, Stefan Saur, Christoph Hauger, Ayşe Mine Evren, Nino Hirnschall, Oliver Findl, Nassir Navab, and Seyed-Ahmad Ahmadi</i>	
Multitlas Calibration of Biophysical Brain Tumor Growth Models with Mass Effect	551
<i>Shashank Subramanian, Klaudius Scheufele, Naveen Himthani, and George Biros</i>	
Chest X-Ray Report Generation Through Fine-Grained Label Learning	561
<i>Tanveer Syeda-Mahmood, Ken C. L. Wong, Yaniv Gur, Joy T. Wu, Ashutosh Jadhav, Satyananda Kashyap, Alexandros Karargyris, Anup Pillai, Arjun Sharma, Ali Bin Syed, Orest Boyko, and Mehdi Moradi</i>	

Peri-Diagnostic Decision Support Through Cost-Efficient Feature Acquisition at Test-Time	572
<i>Gerome Vivar, Kamilia Mullakaeva, Andreas Zwergal, Nassir Navab, and Seyed-Ahmad Ahmadi</i>	
A Deep Bayesian Video Analysis Framework: Towards a More Robust Estimation of Ejection Fraction	582
<i>Mohammad Mahdi Kazemi Esfeh, Christina Luong, Delaram Behnami, Teresa Tsang, and Purang Abolmaesumi</i>	
Distractor-Aware Neuron Intrinsic Learning for Generic 2D Medical Image Classifications	591
<i>Lijun Gong, Kai Ma, and Yefeng Zheng</i>	
Large-Scale Inference of Liver Fat with Neural Networks on UK Biobank Body MRI	602
<i>Taro Langner, Robin Strand, Håkan Ahlström, and Joel Kullberg</i>	
BUNET: Blind Medical Image Segmentation Based on Secure UNET	612
<i>Song Bian, Xiaowei Xu, Weiwen Jiang, Yiyu Shi, and Takashi Sato</i>	
Temporal-Consistent Segmentation of Echocardiography with Co-learning from Appearance and Shape	623
<i>Hongrong Wei, Heng Cao, Yiqin Cao, Yongjin Zhou, Wufeng Xue, Dong Ni, and Shuo Li</i>	
Decision Support for Intoxication Prediction Using Graph Convolutional Networks	633
<i>Hendrik Burwinkel, Matthias Keicher, David Bani-Harouni, Tobias Zellner, Florian Eyer, Nassir Navab, and Seyed-Ahmad Ahmadi</i>	
Latent-Graph Learning for Disease Prediction	643
<i>Luca Cosmo, Anees Kazi, Seyed-Ahmad Ahmadi, Nassir Navab, and Michael Bronstein</i>	
Generative Adversarial Networks	
BR-GAN: Bilateral Residual Generating Adversarial Network for Mammogram Classification	657
<i>Chu-ran Wang, Fandong Zhang, Yizhou Yu, and Yizhou Wang</i>	
Cycle Structure and Illumination Constrained GAN for Medical Image Enhancement	667
<i>Yuhui Ma, Yonghuai Liu, Jun Cheng, Yalin Zheng, Morteza Ghahremani, Honghan Chen, Jiang Liu, and Yitian Zhao</i>	

Generating Dual-Energy Subtraction Soft-Tissue Images from Chest Radiographs via Bone Edge-Guided GAN	678
<i>Yunbi Liu, Mingxia Liu, Yuhua Xi, Genggeng Qin, Dinggang Shen, and Wei Yang</i>	
GANDALF: Generative Adversarial Networks with Discriminator-Adaptive Loss Fine-Tuning for Alzheimer’s Disease Diagnosis from MRI	688
<i>Hoo-Chang Shin, Alvin Ihsani, Ziyue Xu, Swetha Mandava, Sharath Turuvekere Sreenivas, Christopher Forster, Jiook Cha, and Alzheimer’s Disease Neuroimaging Initiative</i>	
Brain MR to PET Synthesis via Bidirectional Generative Adversarial Network	698
<i>Shengye Hu, Yanyan Shen, Shuqiang Wang, and Baiying Lei</i>	
AGAN: An Anatomy Corrector Conditional Generative Adversarial Network	708
<i>Melih Engin, Robin Lange, Andras Nemes, Sadaf Monajemi, Milad Mohammadzadeh, Chin Kong Goh, Tian Ming Tu, Benjamin Y. Q. Tan, Prakash Paliwal, Leonard L. L. Yeo, and Vijay K. Sharma</i>	
SteGANomaly: Inhibiting CycleGAN Steganography for Unsupervised Anomaly Detection in Brain MRI	718
<i>Christoph Baur, Robert Graf, Benedikt Wiestler, Shadi Albarqouni, and Nassir Navab</i>	
Flow-Based Deformation Guidance for Unpaired Multi-contrast MRI Image-to-Image Translation	728
<i>Toan Duc Bui, Manh Nguyen, Ngan Le, and Khoa Luu</i>	
Interpretation of Disease Evidence for Medical Images Using Adversarial Deformation Fields	738
<i>Ricardo Bigolin Lanfredi, Joyce D. Schroeder, Clement Vachet, and Tolga Tasdizen</i>	
Spatial-Intensity Transform GANs for High Fidelity Medical Image-to-Image Translation	749
<i>Clinton J. Wang, Natalia S. Rost, and Polina Golland</i>	
Graded Image Generation Using Stratified CycleGAN	760
<i>Jianfei Liu, Joanne Li, Tao Liu, and Johnny Tam</i>	

Prediction of Plantar Shear Stress Distribution by Conditional GAN with Attention Mechanism	770
<i>Jinghui Guo, Ali Ersen, Yang Gao, Yu Lin, Latifur Khan, and Metin Yavuz</i>	
Correction to: Acceleration of High-Resolution 3D MR Fingerprinting via a Graph Convolutional Network	C1
<i>Feng Cheng, Yong Chen, Xiaopeng Zong, Weili Lin, Dinggang Shen, and Pew-Thian Yap</i>	
Author Index	781