Zongwei Zhou

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Research Overview

Zongwei Zhou received a B.Sc. degree with honors in Computer Science from Dalian University of Technology in 2016. He is currently a Ph.D. student in the Department of Biomedical Informatics, Arizona State University reporting to Dr. Jianming Liang. He has also spent time at Mayo Clinic, University of California, Berkeley, and Université de Montréal. Drawing upon biomedical informatics, computer vision, and deep learning, his research focuses on developing novel methodologies to minimize the annotation efforts for computer-aided diagnosis, therapy, and surgery. Zhou has published 8 peer-reviewed publications in some of the most prestigious journals and conferences in his field, such as IEEE Transactions on Medical Imaging, Medical Image Analysis, CVPR, ICCV, and MICCAI. Moreover, he holds 1 US patent and additional 6 patents pending. He is the recipient of the MICCAI Young Scientist Award in 2019.

Education

- **Arizona State University** — Aug 2017 - present
  - Ph.D. Student of Biomedical Informatics. (GPA: 3.85 / 4.0)
  - Advisor: Dr. Jianming Liang
  - Thesis Committee: Dr. Edward H. Shortliffe, Dr. Murthy Devarakonda
- **Dalian University of Technology** — Sep 2012 - June 2016
  - Bachelor of Engineering in Computer Science and Technology. (GPA: 86.6 / 100, Ranking: 7 / 70)
  - Thesis: Medical image classification based on deep learning
  - Advisor: Dr. Hongkai Wang

Experience

- **Arizona State University** — Aug 2016 - present
  Position: Research Assistant, Advisor: Dr. Jianming Liang
  - Department: Biomedical Informatics
  - Topics: Active Learning in colonoscopy frame classification, polyp detection, pulmonary embolism detection, and carotid intima-media thickness measurement
  - Joint Collaboration: Mayo Clinic, Arizona
- **Centre Hospitalier de l'Université de Montréal** — Jan 2018 - July 2018
  Position: Research Intern, Advisor: Dr. An Tang
  - Department: Laboratoire clinique de traitement de l'image (LCTI)
  - Topics: Predictive model of colorectal cancer liver metastases response to chemotherapy
  - Joint Collaboration: Centre de recherche du CHUM and Mila - Quebec Artificial Intelligence Institute
- **Mayo Clinic, Rochester MN** — June 2017 - July 2017
  Position: Research Intern, Advisor: Dr. Bradley Erickson
  - Department: Radiology Informatics Lab
  - Projects: Thyroid Ultrasound imaging, tumor radiogenomics

Peer-refereed Journal Publications

- Z. Zhou, J. Shin, S. Gurudu, M. Gotway, and J. Liang. "**AFT*: Active Fine Tuning of Convolutional Neural Networks for Reducing Annotation Efforts.**" Submitted to *Medical Image Analysis*.
- Z. Zhou, M. M. Rahman Siddiquee, N. Tajbakhsh, and J. Liang. "**UNet++: Redesigning Skip Connections to Exploit Multi-Resolution Features in Image Segmentation.**" *IEEE Transactions on Medical Imaging, 2019*.

- Z. Zhou, J. Shin, R. Feng, R. Hurst, C. Kendall, and J. Liang. "**Integrating Active Learning and Transfer Learning for Carotid Intima-Media Thickness Video Interpretation.**" *Journal of Digital Imaging,* 2019.
- H. Wang, Z. Zhou, Y. Li, Z. Chen, P. Lu, W. Wang, W. Liu, and L. Yu. "**Comparison of Machine Learning Methods for Classifying Mediastinal Lymph Node Metastasis of Non-Small Cell Lung Cancer from 18 F-FDG PET/CT Images.**" *EJNMMI Research,* 2017.

Peer-refereed Conference Full Publications

- M. M. Rahman Siddiquee, Z. Zhou, R. Feng, N. Tajbakhsh, M. Gotway, Y. Bengio, and J. Liang. "**Learning Fixed Points in Generative Adversarial Networks: From Image-to-Image Translation to Disease Detection and Localization**". *International Conference on Computer Vision (ICCV'19), 2019.*
- Z. Zhou, V. Sodha, M. M. Rahman Siddiquee, R. Feng, N. Tajbakhsh, M. Gotway, and J. Liang. "**Models Genesis: Generic Autodidactic Models for 3D Medical Image Analysis**". *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI'19), 2019.* (**Young Scientist Award**; **Oral**)
- Z. Zhou, M. M. Rahman Siddiquee, N. Tajbakhsh, and J. Liang. "**UNet++: A Nested U-Net Architecture for Medical Image Segmentation.**" *Deep Learning in Medical Image Analysis (DLMIA'18),* 2018. (**Oral**)
- Z. Zhou, J. Shin, L. Zhang, S. Gurudu, M. Gotway, and J. Liang. "**Fine-tuning Convolutional Neural Networks for Biomedical Image Analysis: Actively and Incrementally.**" *Conference on Computer Vision and Pattern Recognition (CVPR'17),* 2017.

US Patents

- Z. Zhou, V. Sodha, M. M. Rahman Siddiquee, R. Feng, N. Tajbakhsh, M. Gotway, and J. Liang. "**Models Genesis: Generic Autodidactic Models for 3D Medical Image Analysis.**" *Tech Id: M19-252LC* (pending)
- M. M. Rahman Siddiquee, Z. Zhou, R. Feng, N. Tajbakhsh, and J. Liang. "**Learning Fixed Points in Generative Adversarial Networks: From Image-to-Image Translation to Disease Detection and Localization.**" *Tech Id: M19-117L* (pending)
- Z. Zhou, M. M. Rahman Siddiquee, N. Tajbakhsh, and J. Liang. "**UNet++: Redesigning Skip Connections to Exploit Multi-Resolution Features in Image Segmentation.**" *Tech Id: M19-189LC* (pending)
- Z. Zhou, M. M. Rahman Siddiquee, N. Tajbakhsh, and J. Liang. "**Nested Ensemble of Convolutional Neural Nets for Medical Image Segmentation.**" *Tech Id: M18-196L* (pending)
- Z. Zhou, J. Shin, and J. Liang. "**AFT*: Active Fine Tuning of Convolutional Neural Networks for Reducing Annotation Efforts.**" *Tech Id: M19-194L* (pending)
- Z. Zhou, J. Shin, and J. Liang. "**Integrating active learning and transfer learning for cutting annotation cost.**" *Tech Id: M17-151L* (pending)
- Z. Zhou, J. Shin, and J. Liang. "**Fine-tuning convolutional neural networks for biomedical image analysis: Actively and incrementally.**" *US Provisional 62/491,069, 4/27/2017. Tech Id: M17-129L*

Awards and Honors

- MICCAI 2019 Young Scientist Award — Oct 2019
- Finalist of MICCAI 2019 Best Presentation Award — Oct 2019
- MICCAI 2019 Graduate Student Travel Award — Aug 2019
- First place for extraordinary research and scholarship in Imaging Informatics at the 5th Annual Student Poster Competition held at Mayo Clinic — April 2019
- Outstanding Graduate of Dalian University of Technology — June 2016

Invited Talks

- **Models Genesis: Generic Autodidactic Models for 3D Medical Image Analysis** — Nov 11 2019
  Venue: Mila – Quebec Artificial Intelligence Institute, Host: Joseph Paul Cohen
- **3D Transfer Learning in Medical Image Analysis** — Oct 24 2019
  Venue: AI研习社
- **Models Genesis: Generic Autodidactic Models for 3D Medical Image Analysis** — Sep 24 2019

Venue: MICS Webinar, Host: Yong Xia, Huiguang He

- **UNet++: A Nested U-Net Architecture for Medical Image Segmentation** Sep 18 2018

  Venue: AI研习社

- **How to Cut Annotation Cost in Biomedical Imaging** May 22 2018

  Venue: Centre Hospitalier de l'Université de Montréal, Host: Catherine Huet

Professional Activities

- Journal Reviewer: Transactions on Medical Imaging, Medical Image Analysis, Biomedical Informatics, IEEE Access, Journal of Biomedical and Health Informatics, Medical Physics, PLOS ONE, and Transactions on Biomedical Engineering
- Conference Program Committee: AAAI-2020, ICCV2019-VRMI

References

- Jianming Liang (Jianming.Liang@asu.edu), Associate Professor, Arizona State University