Li Sun

University of Pittsburgh
Intelligent Systems PhD Student

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EDUCATION

University of Pittsburgh — *Sept 2019-Current*
PhD student in Intelligent Systems — **Pittsburgh**
GPA: 3.92/4.00, advisor: Prof. Kayhan Batmanghelich

Southern University of Science and Technology — *Sept 2015-June 2019*
B.Sc. in Bioinformatics — **Shenzhen**
GPA: 3.86/4.00, ranking: 2/22

Johns Hopkins University — *June 2018-Sept 2018*
Visiting student — **Baltimore**
Undergraduate research assistant in Prof. Yun Chen's lab

AWARDS

China National Scholarship Award (Top 0.5%)
Outstanding Graduates, SUSTech (Top 3%)
First-Class Undergraduate Scholarship, SUSTech (Top 5%)

PUBLICATIONS

Sun, L.*, Yu, K.*, & Batmanghelich, K. (2020). Context Matters: Graph-based Self-supervised Representation Learning for Medical Images. Accepted by AAAI 2021

Sun, L., Chen, J., Xu, Y., Gong, M., Yu, K., & Batmanghelich, K. (2020). Hierarchical Amortized Training for Memory-efficient High Resolution 3D GAN. Submitted to IEEE Transactions on Medical Imaging

Sun, L., Zhang, S., Chen, H., & Luo, L. (2019). Brain Tumor Segmentation and Survival Prediction Using Multimodal MRI Scans With Deep Learning. Frontiers in neuroscience, 13, 810.

Zhang, S.*, **Sun, L.***, Wang, R., Tang, H., Zhang, J., and Luo, L., Structure-aware staging for breast cancer metastases. In: Image Analysis for Moving Organ, Breast, and Thoracic Images. LNCS vol 11040. Springer, Cham

WORK EXPERIENCE

Microsoft Research Asia — *Mar 2019-Aug 2019*
Research Intern, manager: Dr. Eric I-Chao Chang — **Beijing**
- Developed fine-grained model that make used of anatomical structure for chest radiograph interpretation
- Achieved improved results on thoracic diseases that are subtle and require close observation
- Developed reinforcement learning model for interpretable life support device detection and tracing

RESEARCH EXPERIENCE

Context-aware Self-supervised Learning for Medical Images — *May 2020-Sept 2020*
Mentor: Prof. Kayhan Batmanghelich, University of Pittsburgh
- Proposed a self-supervised representation learning method for volumetric medical images that accounts for anatomical context, which is from both local anatomical profiles and graph-based relationship
- Proposed a method that provides task-specific explanation for the predicted outcome
- Short version accepted by Medical Imaging meets NeurIPS workshop (Oral), long version paper accepted by AAAI

Hierarchical Amortized Training for Memory-efficient 3D GAN — *Jan 2020-Nov 2020*
Mentor: Prof. Kayhan Batmanghelich, University of Pittsburgh
- Proposed a novel end-to-end GAN architecture that can generate high-resolution volumetric images while being memory efficient
- Discovered that moving along certain directions in latent space results in explainable anatomical variations in generated images
- Short version paper accepted by Medical Imaging meets NeurIPS workshop, long version submitted to IEEE Transactions on Medical Imaging

Brain Tumor Segmentation and Survival Prediction with Deep Learning *May 2018-Aug 2018*

Mentor: Prof. Lin Luo, Peking University

- Developed an ensemble model of 3D CNNs to segment brain tumor from multimodal MRI scans, then extracted radiomic features from segmented tumor combined with clinical features to predict patients' overall survival
- Ranked 2nd place and 5th place out of 60+ teams in 2018 MICCAI BraTS challenge on survival prediction task and segmentation task respectively, received prize from Intel AI
- Paper accepted by MICCAI BrainLes 2018 workshop and was invited for spotlight presentation

Structure-aware Staging for Breast Cancer Metastases *Nov 2017-June 2018*

Mentor: Prof. Lin Luo, Peking University

- Developed a deep learning approach to determine the stage of for breast cancer metastases using gigapixel pathology images
- Introduced lymph structure information to guide training patch selection and design of features for survival prediction
- Paper accepted by 4th MICCAI Workshop on Breast Image Analysis and was invited for spotlight presentation

ACADEMIC SERVICE

Invited reviewer for MICCAI

CONFERENCE

Medical Imaging meets NeurIPS Workshop 2020 *Dec 2020*
"Hierarchical Amortized Training for Memory-efficient High Resolution 3D GAN", **Poster presentation** **Virtual**

4th MICCAI Workshop on Breast Image Analysis *Sept 2018*
"Structure-aware staging for breast cancer metastases", **Spotlight presentation** **Granada**

International MICCAI Brainlesion Workshop 2018 *Sept 2018*
"Prediction of Survival in Glioma with Deep Learning-Based Segmentation and Radiomics: 2nd Place Solution to Survival Prediction Task", **Spotlight presentation** **Granada**

RELEVANT COURSES

GE105: Basic Computer Programming
GE106: Computer System Design and Application
EE207: Data Structures and Algorithm Analysis
MA333: Introduction to Big Data Science
MA307: Numerical Analysis
CS303: Artificial Intelligence

COMPUTER SKILLS

Languages: C++, Python, JAVA, R, MATLAB
Software: Photoshop, Illustrator, ImageJ
Operating Systems: Windows, Mac OS X, Linux

REFERENCES

Kayhan Batmanghelich, Assistant Professor
University of Pittsburgh
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Eric I-Chao Chang, Senior Director
Microsoft Research Asia
Email: echang@microsoft.com

Lin Luo, Vice Dean, Associate Researcher
Beijing Institute of Collaborative Innovation
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