Kechun Liu

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Education

2019 – present	◇	**Ph.D. student**, Computer Science & Engineering, University of Washington. Advisor: Linda Shapiro
2019 – 2021	◇	**M.S.**, Computer Science & Engineering, University of Washington. Overall GPA: 3.87/4.0
2015 – 2019	◇	**B.Eng.**, Electronic Engineering, Tsinghua University. Overall GPA: 3.73/4.0 (Rank 20/216)

Publications

1 **Liu**, **K.**, Mokhtari, M., Li, B., Nofallah, S., May, C., Chang, O., … Shapiro, L. (2021). Learning melanocytic proliferation segmentation in histopathology images from imperfect annotations. In *Proceedings of the ieee/cvf conference on computer vision and pattern recognition* (pp. 3766–3775).

2 Zong, Z., Feng, J., **Liu**, **K.**, Shi, H., & Li, Y. (2019). Deepdpm: Dynamic population mapping via deep neural network. In *Proceedings of the aaai conference on artificial intelligence* (Vol. 33, pp. 1294–1301).

Research Experience

Ongoing Research

2019.7 – present	◇	**Applying AI to Assess Histologic Features to Improve Melanoma Diagnosis** *Paul G. Allen School of Computer Science and Engineering, Advisor: Linda Shapiro* In-depth knowledge curating medical image dataset including histological image registration and data annotation based on medical knowledge. Two year experience working with dermatopathologists from 4 institutions [1]. Held weekly meetings on building efficient data annotation protocols and improving dataset quality. I'm currently pursuing 3 directions: ● **Melanocyte Detection in Skin Histopatholocial Images**: Propose a GAN-based model for virtual staining on whole slide images to detect melanocytes. ● **Segmenting Melanocytic Proliferations on Skin Biopsy Images**: Propose a melanocytic proliferation segmentation framework by leveraging noisy and sparse labels. Achieved state-of-the-art performance on this specific task. [paper][1] ● **Cell Feature Analysis with Computer-assisted Morphometry**: Analyze morphological features of melanocytes and non-melanocytes to aid melanoma diagnosis.

Previous Research

2020.7 – 2020.9	◇	**Sedeen Viewer Plugins for Cancer Diagnosis** *Paul G. Allen School of Computer Science and Engineering, Advisor: Linda Shapiro* Built plugins in Sedeen Viewer, a whole slide image viewer, for cancer diagnosis. The backend and frontend are Python and C++ respectively. [website] [github]
2018.11 – 2019.5	◇	**Unsupervised Multimodal MRI Segmentation of Stroke Lesion** *MMDP Lab, Advisor: Weibei Dou* Proposed an unsupervised segmentation method based on multimodal brain magnetic resonance images (MRI) of chronic stroke patients to segment stroke lesions including both ischemic and chronic stroke.

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[1]Pathology Associates, Dermatopathology Northwest, VA Puget Sound, and Isfahan University of Medical Sciences

Research Experience (continued)

2018.7 – 2018.9   ◇   **Conronary Calcium Segmentation on Dual Energy CT Images**
The Li Laboratory at Cedars-Sinai and UCLA, Advisor: Debiao Li, and Yibin Xie
Worked on the segmentation and sub-voxel resolution algorithms to extract coronary calcified plaques in dual-energy CT images.

2017.11 – 2018.7   ◇   **DeepDPM: Dynamic Population Mapping via Deep Neural Network**
The FIB Lab at Tsinghua University, Advisor: Yong Li
Proposed the idea to generate dynamic population distributions in full-time series. Designed DeepDPM, an overall model that describes both spatial and temporal patterns based on coarse data and point of interest information. [paper][2]

Teaching Experience

2021   ◇   **CSE 576 Computer Vision**, TA, University of Washington, Seattle

Awards

2019   ◇   **Excellent Honors Graduate**, Tsinghua University.

2018   ◇   **Outstanding Student Award**, Electronic Engineering, Tsinghua University.

    ◇   **ICBC Scholarship**, Industrial and Commercial Bank of China.

2017   ◇   **Jiang Nanxiang Scholarship**, Tsinghua University.

2016   ◇   **National Scholarship**, the government of China.

Skills

Languages ◇	English, Mandarin Chinese.
Programing ◇	Python, C/C++, MATLAB, shell scripts, JavaScript, R, Verilog
Technology ◇	PyTorch, LaTeX, Tensorflow, OpenCV
Relevant Coursework ◇	Computer Vision, Deep Learning, Image Processing, Data Visualization, Statistical Learning, Data Structure, Stochastic Modeling, Machine Learning, Probability, Linear Algebra, Calculus.