Xiaoling Hu

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Current Position
• Harvard Medical School, Boston, USA
  Postdoctoral Research Fellow, Aug. 2023 - Present
  - Hosted by Prof. Juan Eugenio Iglesias and Prof. Bruce Fischl

Research Interests
My research interest lies in the intersection of medical imaging, computer vision and machine learning. In particular, I am interested in:
• Topology-Driven Deep Image Analysis
• Uncertainty Estimation and Its Applications
• Learning with Imperfect Data

Education
• Stony Brook University, Department of CS, USA
  Doctor of Philosophy, Jan. 2018 - Aug. 2023
  - Advisor: Chao Chen
  - Thesis: Learning Topological Representations for Deep Image Understanding
  - Committee: Chao Chen, Dimitris Samaras, Haibin Ling, Li Fuxin
• Tsinghua University, Department of EE, China
  Master of Science, Sep. 2014 - June 2017
• Huazhong University of Science and Technology, Department of EE, China
  Bachelor of Science, Sep. 2010 - June 2014

Selected Publications
(* indicates equal contribution)
[1] Calibrating Uncertainty for Semi-Supervised Crowd Counting
  Chen Li, Xiaoling Hu, Shahira Abousamra, Chao Chen
  International Conference on Computer Vision (ICCV), 2023
[2] Enhancing Modality-Agnostic Representations via Meta-Learning for Brain Tumor Segmentation
  Aishik Konwer, Xiaoling Hu, Xuan Xu, Joseph Bae, Chao Chen, Prateek Prasanna
  International Conference on Computer Vision (ICCV), 2023
[3] Learning Probabilistic Topological Representations Using Discrete Morse Theory
  Xiaoling Hu, Dimitris Samaras, Chao Chen
  International Conference on Learning Representations (ICLR), 2023 (Spotlight, notable-top-25%)
[4] Confidence Estimation Using Unlabeled Data
  Chen Li, Xiaoling Hu, Chao Chen
  International Conference on Learning Representations (ICLR), 2023
[5] Structure-Aware Image Segmentation with Homotopy Warping
  Xiaoling Hu
  Thirty-sixth Conference on Neural Information Processing Systems (NeurIPS), 2022
[6] Learning Topological Interactions for Multi-Class Medical Image Segmentation
Saumya Gupta*, Xiaoling Hu*, James Kaan, Michael Jin, Mutshipay Mpoy, Katherine Chung, Gagandeep Singh, Mary Saltz, Talsin Kurc, Joel Saltz, Apostolos Tassiopoulos, Prateek Prasanna, Chao Chen
*European Conference on Computer Vision (ECCV), 2022 (Oral, 2.7%)

[7] Trigger Hunting with a Topological Prior for Trojan Detection
Xiaoling Hu, Xiao Lin, Michael Cogswell, Yi Yao, Susmit Jha, Chao Chen
International Conference on Learning Representations (ICLR), 2022

[8] A Manifold View of Adversarial Risk
Wenjia Zhang, Yikai Zhang, Xiaoling Hu, Mayank Goswami, Chao Chen, Dimitris Metaxas
*International Conference on Artificial Intelligence and Statistics (AISTATS), 2022

[9] Topology-Attention ConvLSTM Network for 3D Image Segmentation
Jiaqi Yang*, Xiaoling Hu*, Chao Chen, Chialing Tsai
*International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2021

[10] Topology-Aware Segmentation Using Discrete Morse Theory
Xiaoling Hu, Yusu Wang, Li Fuxin, Dimitris Samaras, Chao Chen
*International Conference on Learning Representations (ICLR), 2021 (Spotlight, 5.6%)

[11] 3D topology-preserving segmentation with Z-dimension multi-resolution representation
Jiaqi Yang*, Xiaoling Hu*, Chao Chen, Chialing Tsai
IEEE International Symposium on Biomedical Imaging (ISBI), 2021

[12] Topology-Preserving Deep Image Segmentation
Xiaoling Hu, Li Fuxin, Dimitris Samaras, Chao Chen
Thirty-third Conference on Neural Information Processing Systems (NeurIPS), 2019

[13] Saliency Detection based on Integration of Central Bias, Reweighting and Multi-Scale for Superpixels
Xiaoling Hu, Wenming Yang, Fei Zhou, Qingmin Liao
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2016

Preprints
(* indicates equal contribution)

[1] Topology-Aware Uncertainty for Image Segmentation
Saumya Gupta, Yikai Zhang, Xiaoling Hu, Prateek Prasanna, Chao Chen
Under Review

[2] Deep Statistic Shape Model for Myocardium Segmentation
Xiaoling Hu, Xiao Chen, Terrence Chen, Shanhui Sun
Tech Report

Selected Honors and Awards
• Catacosinos Fellowship (2 out of 200+ PhD students), 2023
• NeurIPS travel award, 2019
• First-class Scholarship, Tsinghua University, 2016 (5%)
• Second-class Scholarship, Tsinghua University, 2015 (10%)
Experiences

Stony Brook University, Department of CS, USA
Sep. 2018 - Present
Research Assistant
Advisor: Prof. Chao Chen

• Topological Data Analysis
• Computer Vision, Medical Imaging
• Robust Machine Learning

Allen Institute, USA
May 2022 - Aug. 2022
Summer Consultant
Mentor: Dr. Matheus Viana

• Topology-Aware Image Segmentation

United Imaging Intelligence (UII), USA
May 2021 - Aug. 2021
Research Intern
Mentor: Dr. Shanhui Sun

• Deep Shape Model Based Network

Tencent Youtu Lab, China
Jun. 2017 - Jan. 2018
Research Intern
Mentor: Dr. Yuwing Tai

• Clothes Detection, Attribute Prediction

Skills

• **Languages**: C/C++, Matlab, Python, Lua, Java
• **OS**: Linux, Mac OS, Windows
• **Tools**: Caffe, Torch, Tensorflow, PyTorch, OpenCV

Service

• Reviewer, International Conference on Machine Learning (ICML)
• Reviewer, International Conference on Learning Representations (ICLR)
• Reviewer, Conference on Neural Information Processing Systems (NeurIPS)
• Reviewer, Computer Vision and Pattern Recognition (CVPR)
• Reviewer, European Conference on Computer Vision (ICCV)
• Reviewer, European Conference on Computer Vision (ECCV)
• Reviewer, Winter Conference on Applications of Computer Vision (WACV)
• Reviewer, Artificial Intelligence and Statistics (AISTATS)
• Reviewer, International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)
• Reviewer, Learning on Graphs Conference (LOG)
• Reviewer, Medical Imaging with Deep Learning (MIDL)
• Program Committee, AAAI Conference on Artificial Intelligence (AAAI)
• Reviewer, Pattern Recognition (PR)
References

- Chao Chen
  Assistant Professor, Stony Brook University
  chao.chen.1@stonybrook.edu
  https://chaochen.github.io/

- Dimitris Samaras
  SUNY Empire Innovation Professor, Stony Brook University
  samaras@cs.stonybrook.edu
  https://www3.cs.stonybrook.edu/~samaras/

- Fuxin Li
  Associate Professor, Oregon State University
  fuxin.li@oregonstate.edu
  https://web.engr.oregonstate.edu/~lif/

- Prateek Prasanna
  Assistant Professor, Stony Brook University
  prateek.prasanna@stonybrook.edu
  https://you.stonybrook.edu/imagineLab/