

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

PRESENTS

Title: Deep Learning Models for Medical Image Synthesis and Segmentation



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Meeting ID: 976 269 9678
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LECTURE ABSTRACT

Abstract: Image classification and segmentation are fundamental problems in medical image analysis. Generation of high-quality synthesized images conditioned on class labels is an effective way of data augmentation that alleviates the challenge of obtaining labeled data for supervised learning. In this talk, I'll first present several conditional generative adversarial models for synthesizing realistic histopathology images given class label or image attributes as conditions. I'll introduce selective synthetic augmentation frameworks that learn to choose synthetic images containing reliable and informative features so as to provide quality assurance when adding synthetic images to training data. On image segmentation, I'll describe SegAN, an adversarial neural network with multi-scale loss for object segmentation from medical images, and a 3D shape-aware organ segmentation method by predicting signed distance maps. This talk will conclude with a quick overview of other recent work on learning biomarkers from medical images for cancer diagnosis and stroke detection, machine learning for virus identification with Raman spectroscopy data, infant video analytics for general movements assessment, and neural networks with attention for clinical report generation.

SPEAKER BIOSKETCH

Dr. Sharon Xiaolei Huang is currently an associate professor in the College of Information Sciences and Technology at the Pennsylvania State University, University Park, PA, USA. She is also an affiliated faculty member of Penn State's Huck Institutes of the Life Sciences. Her research interests lie at the intersection of biomedical image analysis, machine learning, and computer vision. She has over 150 publications and holds 7 patents in related research areas. She is an associate editor for the Medical Image Analysis journal and the Computer Vision and Image Understanding journal. She received her Bachelor's degree in computer science from Tsinghua University, and her Master's and doctoral degrees in computer science

from Rutgers University. Her research has been funded by the NIH, NSF, the Howard Hughes Medical Institute, and the Pennsylvania state.

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