

BIOENGINEERING

Fall 2019 Seminar

Date: Thursday, October 24, 2019
Time: 12:00 pm - 1:00pm
Location: Exploratory Hall, Room L111
(Videoconferencing to SciTech, K. Johnson Hall Rm 254)



Sharon Xiaolei Huang, Ph.D.

Biography: 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 interface between biomedical image analysis, machine learning, and computer vision. She has over 130 publications (including journal articles, book chapters, and refereed conference papers) and holds 7 patents. She is an associate editor for 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.

Title: Learning Biomarkers from Biomedical Image Data

Abstract: From automated classification of skin cancer to smart home devices like Amazon Echo, artificial intelligence research especially deep learning has revolutionized a wide variety of domains from image classification and speech recognition to genomics and drug discovery. In this talk, I will introduce my research that centers around machine learning and image analysis techniques for automatically discovering biomarkers from complex biomedical images. I will present Cervitor, an AI system that learns useful features from large amounts of data including images and other clinical tests to make a diagnosis about cervical cancer. I will show SOAX and TROAX, which are open source software that automatically extract and track the growth and deformation of biopolymer networks from 2D and 3D time-lapse sequences imaged by various microscopic imaging modalities. I will also demonstrate several pioneering conditional Generative Adversarial Network based approaches for high-resolution image synthesis, medical training data augmentation, and image segmentation. The talk will conclude with a quick review of other recent work including computer-aided diagnosis of label-free 3D OCM images of breast tissue, and recurrent neural nets with attention for clinical report generation.