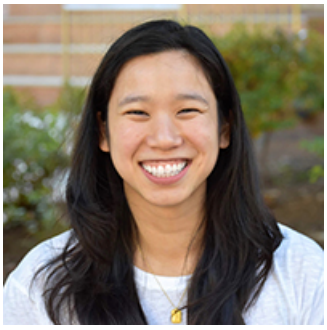
Yale University
Computer Science Talk

Machine learning for equitable healthcare

Host: Steven Zucker



Irene Chen

Wednesday, March 30, 2022
4:00 p.m.

Zoom Presentation

Abstract: Advances in machine learning and the explosion of clinical data have demonstrated immense potential to fundamentally improve clinical care and deepen our understanding of human health. However, algorithms for medical interventions and scientific discovery in heterogeneous patient populations are particularly challenged by the complexities of healthcare data. Not only are clinical data noisy, missing, and irregularly sampled, but questions of equity and fairness also raise grave concerns and create additional computational challenges.

In this talk, I present two approaches for leveraging machine learning towards equitable healthcare. First, I demonstrate how to adapt disease progression modeling to account for differences in access to care. Using a deep generative model, we can correct for patient misalignment in disease onset time to learn more clinically useful disease subtypes. Second, I examine how to address algorithmic bias in supervised learning for cost-based metrics discimination. By decomposing discrimination into bias, variance, and noise components, I propose tailored actions for estimating and reducing each term of the total dscimination. The talk concludes with a discussion about how to rethink the entire machine learning pipeline with an ethical lens to building algorithms that serve the entire patient population.

Bio: Irene Chen is a PhD student in the Clinical Machine Learning group at MIT's Computer Science and Artificial Intelligence Lab (CSAIL), advised by David Sontag. Her work centers on machine learning methods for improving clinical care and making it more equitable, as well as auditing and addressing bias in algorithmic models. Her work has been published in machine learning conferences (NeurIPS, AAAI) and medical journals (Nature Medicine, Lancet Digital Health), and has been covered by media outlets including MIT Tech Review, NPR/WGBH, and Stat News. She has been named a Rising Star in EECS by University of California Berkeley, Harvard, and University of Maryland. Prior to her PhD, Irene received her AB/SM from Harvard and worked at Dropbox.