CSDS 500 Fall 2022 Colloquium

11:30 AM to 12:30 PM
Thursday, September 29, 2022
White 411
(Webinar ID: 927 1216 6189, Passcode: 779124)

"Latent space models for indirectly-observed networks"

Abstract: Networks are ubiquitous in science, serving as a natural representation for many complex physical, biological, and social systems. It is often assumed that a network can be directly observed, and in some settings, such as friendship networks on social media, this may indeed be the case. However, in many application settings, the underlying network is unknown and must be estimated from *indirect observations*. In this talk, I consider a biological network of human leukocyte antigen (HLA) compatibility estimated from outcomes of kidney transplants. In this network, the nodes denote the types of HLAs present in the donor and recipient, and the edge weights denote the compatibilities between the donor and recipient HLAs, which are a significant biological factor affecting post-transplant outcomes. I create a latent space model for this HLA compatibility network, which provides both a low-dimensional representation of the HLAs that can be visualized and a reconstruction of the network that provides more accurate estimates of the HLA compatibilities. Finally, I demonstrate that the latent space model can be combined with a survival analysis model to obtain more accurate predictions of post-transplant outcomes.

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Bio: Kevin S. Xu received the B.A.Sc. degree from the University of Waterloo in 2007 and the M.S.E. and Ph.D. degrees from the University of Michigan in 2009 and 2012, respectively. He is a recipient of the NSF CAREER award, and his research has been supported by several NSF and NIH grants. He is currently an assistant professor in the Department of Computer and Data Sciences at Case Western Reserve University. He was previously an assistant professor at the University of Toledo and held industry research positions at Technicolor and 3M. His main research interests are in machine learning and network science with applications to human dynamics, health care, education, and wearable computing.

This is to certify that _____attended this seminar. Certified by _____.
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