Industrial & Systems Engineering
Seminar Announcement

Large-scale Personalized Health Surveillance by Collaborative Learning and Selective Sensing

Ying Lin, PhD Candidate
Industrial & Systems Engineering
University of Washington

Abstract: The rapid advances in sensing and information technology have provided unprecedented information infrastructure, such as electronic health record (EHR), holding great promises to develop new approaches for personalized health surveillance and accelerate the paradigm transition of the U.S. healthcare sector from reactive care to preventive care. However, leveraging the sensing technology for personalized health surveillance in large-scale population is challenging due to the complexity of disease progression, the widely reported heterogeneity in population, the limited sensing resources, as well as the lack of efficient and cost-effective sensing strategy. This talk will present (a) a novel statistical learning framework, collaborative learning, to effectively translate the sensing data into a heterogeneous population of disease trajectories; (b) a decision support algorithm, selective sensing, to proactively probe information and detect high-risk individuals under limited sensing resources. The proposed methods are further applied in the context of cognitive decline monitoring in Alzheimer's Disease (AD) and depression trajectory monitoring to facilitate the effective use of sensing technology in chronic disease management.

Bio: Ying Lin is a Ph.D. candidate in the Department of Industrial and Systems Engineering at the University of Washington, advised by Prof. Shuai Huang and Prof. Shan Liu. She received her Master's degree in Industrial and Management Systems Engineering from the University of South Florida and Bachelor's degree in Statistics from the University of Science and Technology in China. Her research interests lie at the intersection of data analytics, operations research and medical decision making. She has developed innovative methodologies on statistics and optimization for disease dynamics modeling, personalized prognostics, and adaptive monitoring in large-scale heterogeneous population, including Depression, Alzheimer's Disease (AD) and Diabetes. She has also proposed novel statistical and data mining models to analyze massive longitudinal datasets such as the Electronic Health Record, to facilitate the effective use of information technology, and better decision making in clinical practice.

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