ELECTRICAL & COMPUTER ENGINEERING **BIO-SEMINAR** **Spring 2020** TEXAS A&M UNIVERSITY Engineering

When: **Friday 12:40 – 13:30, March 20, 2020**
Where: **ETB 1035**

Speaker: **Kai He**

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Title: **Early Detection and Robust Feature Learning in Longitudinal Data Analysis**

Abstract: Early detection and contemporaneous risk monitoring with longitudinal data is beneficial for disease prevention and early treatment. Nonetheless, the problem can be challenging due to (1) indistinguishable patterns in disease early stage (2) the data can be irregularly-spaced, missing and not fully labeled (3) varying progressing rates among different populations. We propose a machine learning approach, EDRA (Early Detection and Risk Assessment), which is a risk detector aiming to address these challenges, to achieve disease early detection and monitoring. Considering the fact that the problem p>>n is common in biomedical data analysis and technical heterogeneity is commonly observed across multiple batches of data that are generated from different processing or reagent batches, experimenters, protocols, or profiling platforms, which may lead to model overfitting and unstable performance. To robustify the risk detector, we further propose to extract features and select variables of interest by eliminating the unwanted confounding effects. Simulation studies are presented and the proposed method is applied to real data sets.

Bio: Kai He is a PhD student of Electrical and Computer Engineering at Texas A&M University, who has been advised by Dr. Xiaoning Qian since 2015. Her research interests include machine learning methods with applications in the biomedical area. She received her Bachelor of Science in Electrical Engineering from Shanghai Jiao Tong University in 2015.