

## Combining Power of Semiparametric Models and Machine Learning Algorithms to Learn Optimal Treatment Regimes Using Electronic Health Records



**Abstract:** We consider using EHR data from type 2 diabetic patients to learn optimal treatments among multiple treatment options including metformin, insulin or their combinations. We develop a novel procedure to combine semiparametric models and machine learning algorithms for this purpose.

We first use an integrated model for sparsely measured biomarkers to uncover different subgroups that represent patient's heterogeneity in disease progression. Then within each subgroup, we adopt inverse probability weighting to adjust potential confounders and use matched learning algorithms to estimate optimal treatment strategies. Application to the EHRs from T2D patients in one particular healthcare system reveals some interesting findings.

**About the Speaker:** Dr. Zeng obtained his PhD of statistics from the University of Michigan at Ann Arbor in 2001 and has been a faculty at the University of North Carolina at Chapel Hill since then.

He is a fellow of American Statistical Association and Institute of Mathematical Statistics. His research interest includes machine learning, personalized medicine, semiparametric model, high dimensional data and causal inference.

**Donglin Zeng, PhD**  
**Tuesday, February 18<sup>th</sup>, 11:00am-12:00pm**  
**170 DHLRI**