



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

**SEMINAR ON STATISTICS AND
DATA SCIENCE**

Conformalized Survival Analysis

By

Dr. Zhimei REN

Stanford University

Abstract

Existing survival analysis techniques heavily rely on strong modelling assumptions and are, therefore, prone to model misspecification errors. In this paper, we develop an inferential method based on ideas from conformal prediction, which can wrap around any survival prediction algorithm to produce calibrated, covariate-dependent lower predictive bounds on survival times. In the Type I right-censoring setting, when the censoring times are completely exogenous, the lower predictive bounds have guaranteed coverage in finite samples without any assumptions other than that of operating on independent and identically distributed data points. Under a more general conditionally independent censoring assumption, the bounds satisfy a doubly robust property which states the following: marginal coverage is approximately guaranteed if either the censoring mechanism or the conditional survival function is estimated well. Further, we demonstrate that the lower predictive bounds remain valid and informative for other types of censoring. The validity and efficiency of our procedure are demonstrated on synthetic data and real COVID-19 data from the UK Biobank.

This is joint work with Emmanuel Candès and Lihua Lei.

Biography

Dr. Zhimei Ren received her PhD in Statistics from Stanford University advised by Prof. Emmanuel Candès and she will be joining the University of Chicago statistics department as a postdoctoral researcher in July 2021.

Date : 9 June 2021 (Wednesday)

Time : 11:00am – 12:00nn

Zoom Meeting : <https://hkust.zoom.us/j/99988827320> (Passcode: hkust)

All are Welcome!