**COLLOQUIUM**

Department of Computer Science and Engineering

University of South Carolina

### **A Semiparametric Probit Model for Case 2 Interval-censored Failure Time Data**

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# Abstract

Interval-censored data occur naturally in many fields and the main feature is that the failure time of interest is not observed exactly, but is known to fall within some interval. In this paper, we propose a semiparametric probit model for analyzing case 2 interval-censored data as an alternative to existing semiparametric models in the literature. Specifically, we propose to approximate the unknown nonparametric nondecreasing function in the probit model with a linear combination of monotone splines, leading to only a finite number of parameters to estimate. Both maximum likelihood and Bayesian estimation methods are proposed. For each method, regression parameters and the baseline survival function are estimated jointly. The proposed methods make no assumptions about the observation process and can be applicable to any interval-censored data with easy implementation. The methods are evaluated by simulation studies and are illustrated by two real-life interval-censored data applications.

 **Xiaoyan (Iris) Lin** has been Assistant Professor in the Department of Statistics at University of South Carolina since 2010. Previously she was Visiting Assistant Professor in the Department of Statistics at University of South Carolina and Graduate Fellow in Statistical and Applied Mathematical Sciences Institute (SAMSI). She holds the Ph.D. in Statistics from University of Missouri. Her research interests are in Bayesian Hierarchical Modeling, Objective Bayesian Analysis, Bayesian Survival Analysis, Item Response Theory, and Agreement Measures.