Department of Mathematics and Statistics Colloquium

A Novel, Flexible, Unified Framework for Survival Data

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Abstract: The proportional hazards (PH) model is, arguably, the most popular model for the analysis of lifetime data arising from epidemiological studies, among many others. In such applications, analysts may be faced with censored outcomes and/or studies that institute enrollment criteria. Censored outcomes arise when the event of interest is not observed but rather is known relevant to an observation time(s). The "enrollment issue" arises from studies that exclude participants who have experienced the event prior to being enrolled in the study. To analyze the aforementioned data, herein we propose a novel unified PH model that can be used to accommodate both of these features. To facilitate model fitting, an expectation-maximization (EM) algorithm is developed. To provide modeling flexibility, a monotone spline representation is used to approximate the cumulative baseline hazard function. The performance of our methodology is evaluated through a simulation study and is further illustrated through the analysis of two motivating data sets; one that involves child mortality in Nigeria and the other prostate cancer.

Monday, November 15th at 3:10 pm via Zoom