Statistics Seminar

Department of Mathematics and Statistics

DATE:	Thursday, February 8, 2024
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Zhongyuan Zhao, Binghamton University
TITLE:	Analytic Formulae for the Minimax Characteristics of the Generalized Shiryaev–Roberts Quickest Change-Point Detection Procedure under Exponential Observations

Abstract

We derive analytically exact closed-form formulae for a host of performance characteristics delivered by the Generalized Shiryaev–Roberts (GSR) change-point detection procedure devised to detect a shift in the baseline mean of a sequence of independent exponentially distributed observations. Specifically, the formula is found through direct solution of the respective integral (renewal) equation, and is a general result in that the GSR procedure's headstart is not restricted to a bounded range, nor is there a "ceiling" value for the detection threshold. Apart from the theoretical significance (in change-point detection, exact closed-form performance formulae are typically either difficult or impossible to get, especially for the GSR procedure), the obtained formula is also useful to a practitioner: in cases of practical interest, the formula is a function linear in both the detection threshold and the headstart, and, therefore, the ARL to false alarm of the GSR procedure can be easily computed.