

1098-60-263

Colin Bogdan*, USNA, 1 Wilson Rd #11305, Annapolis, MD 21412, and **David Ruth**.

Applications of Graph-Theoretic Tests to Online Change Detection.

Given a sequence of observations, has a change occurred in the underlying probability distribution with respect to observation order? How well can such a change be detected if the sequence is being monitored in real-time? The problem of detecting change, and doing so with minimal delay, is an important one in a wide array of real-world situations. Change-point problems may be classified as online or offline. In online problems, data are collected in real-time, with the goal of identifying a change as soon as possible after it occurs. In offline problems, data collection is halted for analysis to occur and the goal is to determine if, and maybe when, a change occurred in the data sequence. This project explores nonparametric graph-theoretic approaches to solving such problems in an online setting. We use the Ensemble Sum of Pair-Maxima (ESPM) Test, an offline test developed by Ruth and Koyak (2011), as the start for our new methodology and extend it for use in online situations. Our work investigates the capacity of the ESPM Test in a variety of distributional and dimensional settings, and ultimately modifies the ESPM Test for online settings through a novel modification of recently developed multiple testing procedures designed to control false discovery rate. (Received January 27, 2014)