Sequential Nonparametric Tests for a Change in Distribution: 
an Application to Detecting Radiological Anomalies

by

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Date: January 29, 2019 (Tuesday)
Time: 11:00am – 12:00noon
Venue: Room 1003 (LSK Business Building)

Abstract  In this talk I will propose a sequential nonparametric test for detecting a change in distribution, based on windowed Kolmogorov—Smirnov statistics. The approach is simple, robust, highly computationally efficient, easy to calibrate, and requires no parametric assumptions about the underlying null and alternative distributions. I show that both the false-alarm rate and the power of our procedure are amenable to rigorous analysis, and that the method outperforms existing sequential testing procedures in practice. I then apply the method to the problem of detecting radiological anomalies, using data collected from measurements of the background gamma-radiation spectrum on a large university campus. In this context, the proposed method leads to substantial improvements in time-to-detection for the kind of radiological anomalies of interest in law-enforcement and border-security applications. I will also briefly mention some of my other research directions.

Bio  Oscar Hernan Madrid Padilla is a Neyman Visiting Assistant Professor in the Department of Statistics at University of California, Berkeley. Before that, he earned a Ph.D. in statistics at The University of Texas at Austin in May 2017 under the supervision of Prof. James Scott. Prior to that, he completed a B.S in Mathematics at CIMAT in April 2013 advised by Prof. Daniel Hernandez-Hernandez. His research interests include: network estimation problems, change point detection, tensor denoising, deconvolution, nonparametric regression, and graphical models.

All interested are welcome!
For details, please contact ISOM Department.