

## **Quickest detection of abrupt changes with applications**

The problem of detecting abrupt changes in the behavior of an observed signal arises in a variety of fields including finance, image analysis and computer network security. Using the methods of stochastic dynamic programming and statistical sequential techniques, this course describes the fundamentals underpinning the field providing the background necessary to design analyze and understand quickest detection algorithms. In this course we will provide a unified treatment of several different approaches to the quickest detection problem. We will draw examples from the field of finance where we will design on-line detection algorithms to detect abrupt changes in the mean return of stocks and stock indices. We will also draw examples from Anomaly detection Systems used in network security and in particular DOS attacks, worm and ARP MIM attacks.