Online Financial Changepoint Detection – Project Outline

In this project we will be looking at the online changepoint detection discussed in Fearnhead and Liu (2007), coding it, and testing it on existing data. We will be making improvements to the algorithm in areas such as speed and storage space. In addition, we would like to extend it from predicting solely on changes of mean with fixed variance, into an algorithm that can deal with more parameter changes at changepoints, such as variance.

In addition we will be comparing it to other existing changepoint detection methods such as PELT and XXXX.

Report basic structure

1. Intro
   1. What is a changepoint, pictures
2. Background
   1. Other methods
   2. Online vs offline, why we care about online, reference finance
3. Describe fearnheard liu in detail
   1. Point to strengths AND WEAKNESSES vs other methods described earlier
   2. Include subsections of weaknesses eg (estimating gap between changes, memory, fixed standard deviation, expected value is only previous)
4. Simulation study/tests
   1. Look through other papers with good simulation studies to see what to do
   2. Looking at (false alarm rate, average run length …
5. Apply this to an interesting financial example.
   1. Comparing to other methods
6. The end. Conclusion.