

Special Event: For Students and Faculty

Joint Math Seminar Series, Math Club and Center for Logic Algebra Computation

Math Seminar: Trends and Trades

In this work, we build a trend following algorithm based on the sequential statistical rule known as the cumulative sum (CUSUM), which has traditionally been used for the online detection of abrupt changes in the distribution of sequences of observations. We build a trading strategy based on the CUSUM stopping rule and apply it to high-frequency tick data from 5-year and 30-year US Treasury notes sold at auction. We analyze the performance of the proposed trend following strategy in detail. In particular, it is seen that the proposed trading rule is most profitable during times of market instability and long trends. We further derive the expected value of the gain of the proposed strategy for a class of random walk models. It is seen that the suggested strategy is most profitable in biased random walks but is indifferent to the direction of the bias. We also examine the performance of the proposed strategy in simulated data from appropriate random walks and analyze this behavior in relation to the analytical results and the results of the performance of the strategy on the actual data. We finally discuss how other statistics may be used to improve the performance of our proposed algorithm. This is joint work with Michael Carlisle and Ioannis Stamos

Bio

I was born in Athens Greece. All my undergraduate studies were completed in Toronto, Canada, where I studied Statistics. I then completed a Master's degree in Mathematics with specialization in Statistics and Finance at the University of Waterloo in Waterloo, Canada. I worked as an intern for Citibank Canada and as an Associate Financial Engineer at Algorithmics Inc. in Toronto, Canada. I then completed my PhD at the Department of Statistics of Columbia University in 2005 with distinction under the supervision of [JanVecer](#) and the mentorship of [G.V. Moustakides](#). I finally joined the group of Dean [H. V. Poor](#) as a postdoc at Princeton's Department of Electrical Engineering for two years before assuming my position at the City University of New York, where I co-authored a research manuscript in the area of quickest detection. My research interests began in the area of quickest detection and sequential analysis. In my earlier years as a researcher I have addressed fundamental problems arising in the area of [quickest detection](#) and sequential analysis. For this work I received the [NSA](#) Young Investigator's award by the Division of Mathematical and Physical Science in the area of Probability in 2009. Since then, in my attempt to seek further applications of quickest detection and statistical surveillance, I got involved in the development of algorithms for online detection and classification of objects in point clouds of urban scenes, a problem in [computer vision](#). This work has led to further external funding by the [NSF](#). I have also been involved in the area of financial engineering through the study of [drawdowns](#) and drawdown insurance and more recently in the applications of detection algorithms in

algorithmic trading. While at Brooklyn College I also built and launched a new program in Financial Mathematics. This program has been running at Brooklyn College since 2011.

Place: Namm 1003

October 9th, 2014, 1-2 p.m.

Professor Dr. Olympia Hadjiliadis (Brooklyn College and Graduate Center)

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