

Hidden Markov Model and Applications

Nguyet Nguyen

Department of Mathematics and Statistics

Youngstown State University

Hidden Markov Model (HMM) is a well-known model for signal detection based on Markov chain process. It has been used in many fields such as speech recognition, hand writing recognition, biomathematics, and financial economics. In this talk, I will give a brief introduction on HMM and introduce its applications. In particular, I have been using the HMM to predict regimes of some macro economics variables such as Gross Domestic Product, Consumer Price Index, Stock Market Index and Market Volatility, the major economics indicators that significantly impact the stock market. In one of my recent works, we analyze the performances of all of the S&P 500 stocks during the major economic variables' regimes to make a monthly stock selection for our investment portfolio. Numerical results showed that our portfolio had higher returns and lower risk compared to the benchmark index S&P 500. Other applications of HMM will also be proposed with great details.