# *Tiwalayo Eisape*

**Title:** Analyzing the Foreign Exchange Market with Google Deep Dream

**Advisor:** Robert Muller

Technical analysis is one of the most controversial methods of predicting market behavior. Although several schools of thought maintain the belief that there is no way to consistently predict future market activity, technical analysts attempt to use past market statistics to find patterns in the movements of specific securities or currencies. I will attempt to establish some efficacy in one of the most mathematically mysterious forms of technical analysis: Fibonacci retracement. With the help of Robert Muller and the computer science department, I will engineer a version of Google Deep Dream, to analyze segments of market data containing examples of Fibonacci retracement, as opposed to the original Deep Dream which was built to analyse pictures.

Google Deep Dream uses algorithmic pareidolia to analyze pre-trained neural networks. This algorithm (developed by Alexander Mordvintsev, Christopher Olah, and Mike Tyka) can be fed any image, or even random noise, and will adjust the data toward the given neural network's interpretation of it. This has lead to unique and even 'dream-like' interpretations of data. When applied to the Foreign Exchange market, Google Deep Dream could lead to unique interpretations on market data and even shed light on underlying structure in the Foreign Exchange market.

Once developed, I will use this new version of Deep Dream to make extrapolations on static noise which could lead to new interpretations on the market, and Fibonacci retracement as a structure.