

**SEMINAR**  
**CENTER FOR APPLIED MATHEMATICS AND SCIENCE**  
**DEPARTMENT OF MATHEMATICS**  
**UNIVERSITY OF WEST GEORGIA**

**11:00 AM, THURSDAY, APRIL 18<sup>th</sup>, 2019, VENUE: BOYD 306**

**Speaker: Dr. Elham Sohrabi, Department of Mathematics, UWG**

**Title: Option Valuation Under A Regime-Switching Model Via FFT**

**Abstract:** This presentation is concerned with fast Fourier transform (FFT) approach to option valuation, where the underlying asset price is governed by a regime-switching geometric Brownian motion (RSGBM). An FFT method for the regime-switching model is developed first. To test the FFT method, as usual, we try to implement Monte Carlo simulation, as frequently serves as a benchmark for testing other numerical methods. A novel semi-Monte Carlo simulation algorithm is developed as well. This method takes advantage of the observation that the option value for a given sample path of the underlying Markov chain can be calculated using the Black-Scholes formula. Finally, numerical results are reported. All proofs and Python programming are placed in the Appendix of my PhD dissertation. It is my hope that this information when combined with some familiarity with the language, or at least an error checking IDE, that any reader will be able to replicate my results with little trouble.

All are welcome.