

22nd Annual Natural Sciences Academic Festival
Mathematics Department
Capstone Presentations
Friday, 6 May 2016, Morken 216

12:30 PM - 1:00 PM **Ryan Chynoweth**

Regression Techniques Utilized by Data Scientists

A data scientist is a data analyst, statistician, computer programmer and most importantly mathematician. We will explore a few techniques data scientists use to model real-world problems by taking an in depth look at the theories behind regression and applying it to a dataset.

1:00 PM - 1:30 PM **Hayden McCartney**

Discrete-Time Options Pricing Model

This paper presents a simplified approach to valuing American derivative financial options in a discrete-time model. Using fundamental economic principles through arbitrage methods we can derive the famous Black-Scholes option pricing model in a much simpler method.

1:30 PM - 2:00 PM **Ryne Wilmes**

Modeling Volatility for Optimal Investment Strategies

The focus of this talk will be on conditional variance and modeling periods of asset volatility. Applying processes such as ARCH and GARCH to capture these periods allows us to build investment strategies to account for volatility and optimize returns.

2:00 PM - 2:30 PM **Alyssa Workman**

Dynamic Nonlinear Models of Marriage

John Gottman, a psychologist known for his mathematical applications of marriage, applies dynamic nonlinear models to human emotion and psychology to give us a better understanding of "love". In this talk, we report on his mathematical equations and theories about the success of marriage.

2:30 PM - 3:30 PM **Poster Presentation Session**
Snack Buffet
Morken Center Atrium/Hallway

3:30 PM - 4:00 PM **Christina Gray**

Modeling Pacific Northwest Glaciers with Differential Equations

Glaciers are sources of water for the localities around them as well as climate indicators. Using a numerical model to quantify how physical characteristics of glaciers will affect their response to climate change helps us understand the future of these water sources

4:00 PM - 4:30 PM **Dominique Jackson**

Time Series and Cycles: What They Are and How We Can Use Them

This talk presents the use of cycles and times series to forecast business models. We will provide an overview of the methods used to characterize cycles, explain models of cycles, and give examples of how those business models work to forecast the Standard & Poor's 500 Index (S&P).