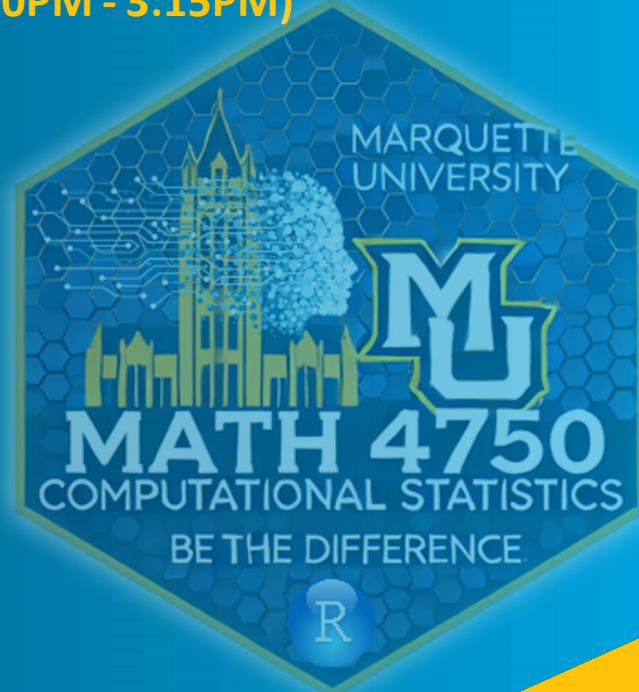


Computational Statistics



Tentative topics:

- **Methods for Generating Random Variables**
- **Visualization of Multivariate Data**
- **Monte Carlo Integration & Variance Reduction**
- **Bootstrap and Jackknife**
- **Density Estimation**
- **Regularization:**
 - Ridge and Lasso
 - Smoothing
- **Dimension Reduction and Clustering**
 - K-Means and Hierarchical Clustering
 - Principal Component Analysis (PCA)
- **Numerical Methods in R**
 - Optimization
 - Expectation-Maximization (EM) Algorithm
- **Advanced R Programming**
 - Introduction to Parallel Computing
 - Object Oriented Programming in R
 - Developing an R Package
 - Developing an Interactive Shiny App
- **Deep Learning in R**
 - Basics of Neural Network
 - Implementation using TensorFlow and Keras
 - Fully Connected Network (FCN)
 - Convolutional Neural Networks (CNN)



Prerequisites:

- A course in Programming (COSC 1010)
- A course in Probability or Regression (MATH 4700 or 4780)
- A course in Linear Algebra (MATH 3100)

For more information, email the instructor:

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