FALL 2019

Instructor: Harry Wechsler wechsler@gmu.edu ENG 4448

Theory / Application Data Mining – 72736 – CS 584 001

Art and Design Building L008 – R 4:30 – 7:10

Office Hours: R 3:45 – 4:15 and 7:30 – 8:00

(Tentative) Course Description: Concepts and methods for data mining and multidisciplinary applications. Topics include (1) Artificial Intelligence, Data Bases, Machine Learning, and Pattern Recognition, Analytics, Data Mining: Big and Small Data, Explanation and Prediction, Learning and Model Selection, and (Modular) System Design and Architectures; (2) Protocols and Standards, Benchmarks and Metrics, Interoperability, Performance Evaluation and Cross-Validation, Logistics, and Software Platforms and Hardware; (3) Probability, Bayes and Maximum a Posteriori (MAP) Classification, Naïve Bayes, and Statistics; (4) Databases and Data Sets, Data Cleaning and Transformation, Deep Learning, Classification and Decision Trees, Ensemble Methods, Association and Production Rules, Clustering and Anomaly Detection (see textbook); (5) Advanced Topics: Deep Learning (see Reference) and Learning Vector Quantization and Self-Organization Maps; and (6) Applications including Image, Sentiment, and Text (word2vec) Analysis, Scalability and Transfer Learning, and Generative Adversarial Networks (GAN).

Required Textbook: P. N. Tan, M. Steinbach, A. Karpatne, V. Kumar, *Introduction to Data Mining*, (Second Edition), Pearson, 2018. http://www-users.cs.umn.edu/~kumar/dmbook/index.php and **SLIDES** https://www-users.cs.umn.edu/~kumar001/dmbook/index.php#item4

Required Reference: A. Ng, ***Machine Learning Yearning*****,** 2019, https://www.deeplearning.ai/machine-learning-yearning/

Reference: E. Charniak, ***Introduction to Deep Learning***, MIT Press, 2019, https://mitpress.mit.edu/books/introduction-deep-learning (see Buying and Rent eTextbook)

(Weekly) Lecture and Discussion: (1) Background and Methods; (2) Critical Thinking; (3) Challenges and Emerging Themes; and (4) Ethics, Privacy, and Security.

https://registrar.gmu.edu/calendars/fall-2019/

First day of classes: August 29

Thanksgiving Recess: November 28

Last day of classes: December 5

https://registrar.gmu.edu/calendars/fall-2019/final-exams/

Exam Date and Time: R, 12/12, 4:30 – 7:15

Grading

Homework (Problem Solving) Assignment 10%

Homework (Data Mining #1) Assignment 15%

Term (Team) Project (Data Mining #2) Project 30%

Mid-Term 15%

Final 30%

Special Accommodations

If you are a student with a disability, please see your instructor and contact the Office of Disability Services (ODS) at (703) 993-2474. All academic accommodations *must* be arranged through ODS http://ods.gmu.edu

Academic Integrity and Honor Code

https://oai.gmu.edu/mason-honor-code/full-honor-code-document/