CS 688 - Fall 2017

Pattern Recognition – 75482 – CS 688 - 001

Prerequisites: CS 580

Instructor: Prof. Harry Wechsler wechsler@gmu.edu

Course Description – Explores statistical pattern recognition and neural networks. Pattern recognition topics include Bayesian classification and decision theory, density (parametric and nonparametric) estimation, linear and nonlinear discriminant analysis, dimensionality reduction, feature extraction and selection, mixture models and EM, and vector quantization and clustering. Neural networks topics include feed-forward networks and back-propagation, self-organization feature maps, and radial basis functions. Advanced topics include statistical learning theory and support vector machines, convolutional neural networks and deep learning, and text analysis using word2vec. [Course] emphasizes experimental design, applications, and performance evaluation.

Time, Day, and Venue: T – Tuesday, 7:20 – 10:00 pm, Innovation Hall 134

Office Hours: T – Tuesday, 6:15 – 7:00 pm, ENGR 4448

http://registrar.gmu.edu/calendars/fall-2017/

First day of classes: Tuesday, August 29

Columbus Day Recess: no class on Tuesday, October 10

Last day of classes: Tuesday, December 5


Final Exam: Tuesday, December 19, 7:30 – 10:15 pm


**Course Outline**

1. Bayesian Classification / Decision Theory

2. Parameter Estimation

3. Feature Selection and Dimensionality Reduction

**REVIEW for MIDTERM, October 17**

4. Mixture Models and Ensemble Methods

5. Clustering and Competitive Learning

6. Linear Discriminant Functions

7. Connectionism and Neural Networks

8. Deep Learning

9. Support Vector Machines

10. Text Analysis Using word2vec

**REVIEW for FINAL, December 5**

**Grading Composition (100 points)**

- Homework – 25%
- Mid Term – Tuesday, October 24 – 20 %
- Term Project – November 28 – 25 %
- Final – Tuesday, December 19 - 30 %

**Grading Scale**

[http://www.fcps.edu/southcountyhs/sservices/gradescale.html](http://www.fcps.edu/southcountyhs/sservices/gradescale.html)
Honor Code

You are expected to abide by the GMU honor code. Homework assignments and exams are individual efforts. Information on the university honor code can be found at http://oai.gmu.edu/the-mason-honor-code/


Learning Disability Accommodation

If you have a documented learning disability or other condition which may affect academic performance, make sure this documentation is on file with the Office of Disability Services (ODS) and then discuss it with the professor in his office regarding accommodations.