## Summary

Theories and methods for automating and representing knowledge with an emphasis on learning from input/output data. The course covers a wide variety of approaches, including Supervised Learning, Neural Nets and Deep Learning, Reinforcement Learning, Expert Systems, Bayesian Learning, Fuzzy Rules, and Genetic Algorithms. Each student focuses on two of these approaches and creates a term project.

## Prerequisites

MET CS 566 or instructor's consent.

## Week-by-week

The order of the following topics is 90% certain. They are subject to change according to student background and rapidly emerging technology.

1. Sept 7 : Introduction I (The Introduction will enable you to pick a tentative term topic)

2. Sept 14: Introduction II

3. (NOTE) Sept 28: Supervised Learning
   Learning with Neural Nets I

4. Oct 5: Learning with Neural Nets II

5. Oct 12: Deep Learning

6. Oct 19: Expert Systems

7. Oct 26: Fuzzy Rules

8. Nov 2: Genetic Algorithms I

10. Nov 9: Genetic Algorithms II

11. Nov 16: Decision Trees

12. (NOTE) Nov 30: Bayesian Learning; Dealing with Uncertainty

13. Dec 7: Presentations

## Textbook and Other Source Book

The main book I'll use is "Machine Learning" by Marsland (2nd edition) ISBN-13: 978-1466583283.
A good book on deep learning is "Fundamentals of Deep Learning" by Buduma (O'Reilly)

## Learning Objectives

Students will accomplish the following.

(1) Understand the goals of Machine Learning and Expert Systems

(2) Understand the main ML technologies

(3) Implement more than one of these techniques in a significant manner

## Grade Allocation

Quizzes: 10%

Project Proposal: 15%

Project Design: 30%

Project Implementation: 45%