

# CSCI6506 – Assignment 1: Machine Learning

Instructor: Malcolm Heywood

Assignment due date: 22 September in class  
(or email by midnight)

## Notes:

There are more than one ‘correct’ answer to these questions.  
Reference source material used in establishing your answers.

1. Relative to temporal sequence learning (also referred to as reinforcement learning), two basic categories of approach exist: Value function optimization, or Policy search. Summarize the basic differences between the two approaches and discuss the advantages/ disadvantages you might expect each approach to possess.
2. In what ways might metaphors from evolution provide models for credit assignment in machine learning? Provide three specific examples.
3. How might multiple criteria be incorporated into a cost function for guiding credit assignment? Are there any limitations associated with the proposed mechanism?
4. In what way do decisions regarding credit assignment impact on cost function and representation? Illustrate your example with a machine learning algorithm based on
  - (a) greedy credit assignment and;
  - (b) stochastic credit assignment.