

CptS 580: Reinforcement Learning, Spring 2017

EME 130, noon-1:15pm T,Th

Course webpage: http://eecs.wsu.edu/~taylorm/17_580

Office hours: by appointment (please use meetme.so/taylorm)

Project submissions & grades: <http://learn.wsu.edu>

Discussion platform: <https://piazza.com/wsu/spring2017/580/home>

Dr. Matthew E. Taylor (“Matt” is preferred)

Office: EME 137

Email: taylorm@eecs.wsu.edu (Please tag emails with **[CPTS580]** for fastest response)

Office phone: 509-335-6457 (email is preferred)

This course is an informal graduate seminar. There will be assigned readings and discussions. The exact content of the course will be guided in part by the interests of the students. It will cover at least the first 9 chapters of the course textbook. Beyond that, we will either continue with the text or move to more advanced and/or recent readings from the field with an aim towards focusing on the practical successes and challenges relating to reinforcement learning.

There will be a programming component to the course in the form of exercises and a final project. Students will be expected to be proficient programmers.

Students will be expected to read and summarize conference papers and journal articles on relevant topics. Advanced undergraduate students can take this class, with permission from the instructor – they should expect reading such papers to take non-trivial amounts of time.

Pre-Requisites: Some background in artificial intelligence is recommended.

Textbook

- Reinforcement Learning: An Introduction. Richard S. Sutton and Andrew G. Barto. 1998. Available for free online: <http://www.cs.ualberta.ca/~sutton/book/the-book.html>

Student Learning Outcomes

- Understanding the major challenge areas in reinforcement learning
- Ability to apply basic reinforcement learning algorithms to solve fundamental problems

Grades will be based on the following (subject to change, with notice):

Written responses to the readings (15%)

By 5pm on the afternoon before a class with a new reading assignment due, everyone must submit a brief question or comment about the readings. If you are the first person to post, please start a new “note,” post it to “entire class” and enter the summary as “Reading Response for *date*”. If someone has already started a note for a given class, please “Start a new follow-up discussion” to group the class’s responses together.

In some cases, specific questions may be posted along with the readings. But in general, it is free form. Credit will be based on evidence that you have done the readings carefully.

Acceptable responses include (but are not limited to):

- Insightful questions;
- Clarification questions about ambiguities;
- Comments about the relation of the reading to previous readings;
- Solutions to problems or exercises posed in the readings;
- Critiques;
- Thoughts on what you would like to learn about in more detail;
- Possible extensions or related studies;
- Thoughts on the paper's importance;
- Responses to other people’s written response; and
- Summaries of the most important things you learned.

You can see example responses from a different class here:

http://eecs.wsu.edu/~taylorm/17_580/exampleResponses.html

Class participation (15%)

Students are expected to be present in class having completed the readings and participate actively in the discussions.

Oral presentation/discussion moderation (10%)

Each student will be expected to lead a discussion on one of the readings. The discussion can begin with a brief summary/overview of the important points in the readings, but the assumption is to be that everyone has already completed the readings. The student may either present material related to the readings (perhaps from an outside source) or moderate a class discussion about the readings. In the latter case, the student must be prepared to keep the conversation flowing. Your biggest success would be for the class to have a discussion related to the topic where you only provide high-level guidance. It is recommended that you present your plan for the discussion, including any slides you intend to show, to Matt at least three nights prior to your discussion.

Preliminary programming exercises (20%):

Each student will be required to complete four minor programming assignments. Matt will suggest 4 exercises, but students may choose to substitute their own exercise (with permission from Matt). These exercises need not involve extensive or elaborate programs. The emphasis is to be on empirically analyzing various learning algorithms and reporting

on the results. You may wish to present the results of one of your exercises in conjunction with your oral presentation/discussion moderation. Upon completion, please submit via **blackboard**. If the attachment is going to be large, I suggest you use dropbox, or some other file sharing site. Please be very clear about what works, what doesn't work, etc. Remember, the easier you make your project to grade, the happier Matt will be.

Grading criteria for programming assignments (out of 10):

7 and 7.5 - Adequate, but really didn't go beyond the minimal analysis

8 and 8.5 - Good job, but there is room for improvement

9 and 9.5 - Good analysis, results well presented

10 - Excellent, with interesting research issues identified. Doing more than what has been asked.

Final programming project (40%):

A more extensive final programming project, along with written report, will be due on the day of the scheduled final exam (May 2nd).

5% of the grade: Students will be expected to agree with the instructor on the topic of the project by spring break.

15% of the grade: A rough draft is due two weeks before the final version is due (April 18).

20% of the grade: The final report, roughly equivalent to a conference paper in format, length, and style. Empirical results should be included to evaluate the approach.

Submit a copy of your source code, your final report, and any other relevant data by 11:59pm on May 2nd. Late work will be accepted, but the grade will be reduced by 10% for every day that it is late.

Email

I expect to answer student email within 48 hours, unless it is the weekend. Feel free to ping me if it has been more than two working days and I have not responded. To make sure your mail gets filtered correctly (i.e., gets my attention), please begin emails with a subject of: [CPTS580]

Classes

Class lectures, discussions, etc., may be recorded, primarily so that those who miss class can catch up. However, I encourage you to come to class; if you are not in class, you cannot participate. If you have any concerns about being recorded, please let Matt know.

Meetings

I am not going to schedule office hours specifically for this class. However, I'm very happy to meet! You can schedule a meeting by going to:

meetme.so/taylorlorm

This semester I'm trying to group meetings on Tuesday, Wednesday, and Thursday, and earlier in the day is better than later. But if that doesn't work with your schedule, we'll find times that are mutually convenient.

Phones/laptops/i-Things during lecture

You may use electronics to take notes and/or look up information in class. However, please make sure your device is silent.

Academic Integrity

Students are encouraged to use the internet and work with classmates on assignments. However, each student must turn in original work. No copying from other sources will be accepted. Students who violate this policy will receive a zero grade on the assignments in question and/or receive a failing grade for the course. Please talk to the instructor if you have questions about this policy. All academic integrity issues will be handled in accordance with university regulations. See conduct.wsu.edu for details.

Statement Concerning Accommodations:

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building, Room 217; 509-335-3417 to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. More information can be found at accesscenter.wsu.edu

Safety and Emergency Notification

Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.