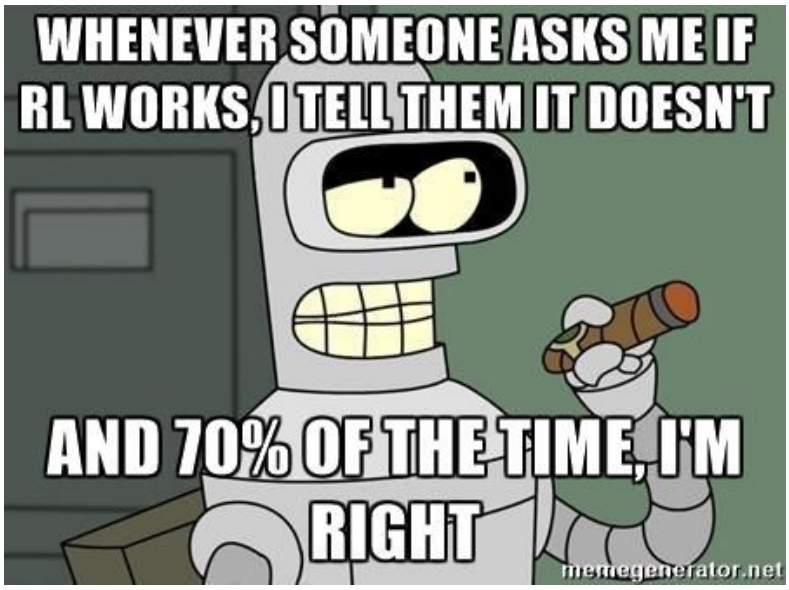
**2110593 Reinforcement Learning**
**Fridays 9:00-12:00 ตึก 3 ห้อง 206**
**Fall 2019**

ผู้สอน อ. ดร. เอกพล ช่วงสุวนิช, ดร. ณัฏฐ์ ดิลกธนากุล, Konpat Preechakul, Charin Polpanumas




Picture source: https://www.alexirpan.com/2018/02/14/rl-hard.html

Course Outline

This course will give an overview of the techniques behind reinforcement learning. The course will cover both traditional RL and deep RL. The first part covers the topics of Estimation, Monte Carlo, Temporal Difference, and off policy learning. The second part will introduce the concept of function approximators (neural networks) and how it can be applied in the traditional RL framework. The third part of the course will cover more advanced topics such as policy gradients, trust region models, and world models. Students that finishes the course should be able to understand and be able to implement state-of-the-art reinforcement learning models and recent publications. Students who take the course are expected to have strong probability and statistics background, fundamental understanding of deep neural networks, and python programming.

Framework: TF2.0 (Python)

**Prerequisite: Pattern Recognition (2110597)**

Schedule (Subject to change)

| Class | Topic | Assignments |
|---|---|---|
| 1 - 16/8 | Intro to RL | Assignment 0 |
| 2 - 23/8 | The framework and Dynamic Programming | Assignment 1 |
| 3 - 30/8 | Monte Carlo and Temporal Difference | Assignment 2 |
| 4 - 6/9 | Q-learning, n-step TD, Off policy learning 1 | Assignment 3 |
| 5 - 13/9 | Off policy 2, Value function approximation | Assignment 4 |
| 6 - 20/9 | Value 2, Off policy learning in value function | Assignment 5 |
| 7 - 27/9 | Practical RL 1 | Assignment 6 |
| 4/10 | Commencement day, no class | |
| 11/10 | Midterm exam week, no class | |
| 8 - 18/10 | Model-based and planning | Assignment 7 |
| 9 - 25/10 | Policy gradients | Assignment 8 |
| 10 - 1/11 | Trust region methods | Project starts |
| 11 - 8/11 | Exploration | |
| 12 - 15/11 | Practical RL 2 | |
| 13 - 22/11 | Misc topics (Panel+discussions) | |
| 14 - 29/11 | Project presentation | |

Score distribution
Assignments 60% (7% each with 3% extra)
Project 40%

Grading criteria
> 80% A
> 75% B+
> 70% B
> 65% C+
> 60% C
> 55% D+

> 50% D
< 50% F

Textbook
Richard S. Sutton and Andrew G. Barto, *Reinforcement Learning: An Introduction* 2nd edition.
http://incompleteideas.net/book/the-book-2nd.html