CSC 8980 Deep Reinforcement Learning

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https://titan.cs.gsu.edu/~sji/teaching/drl/

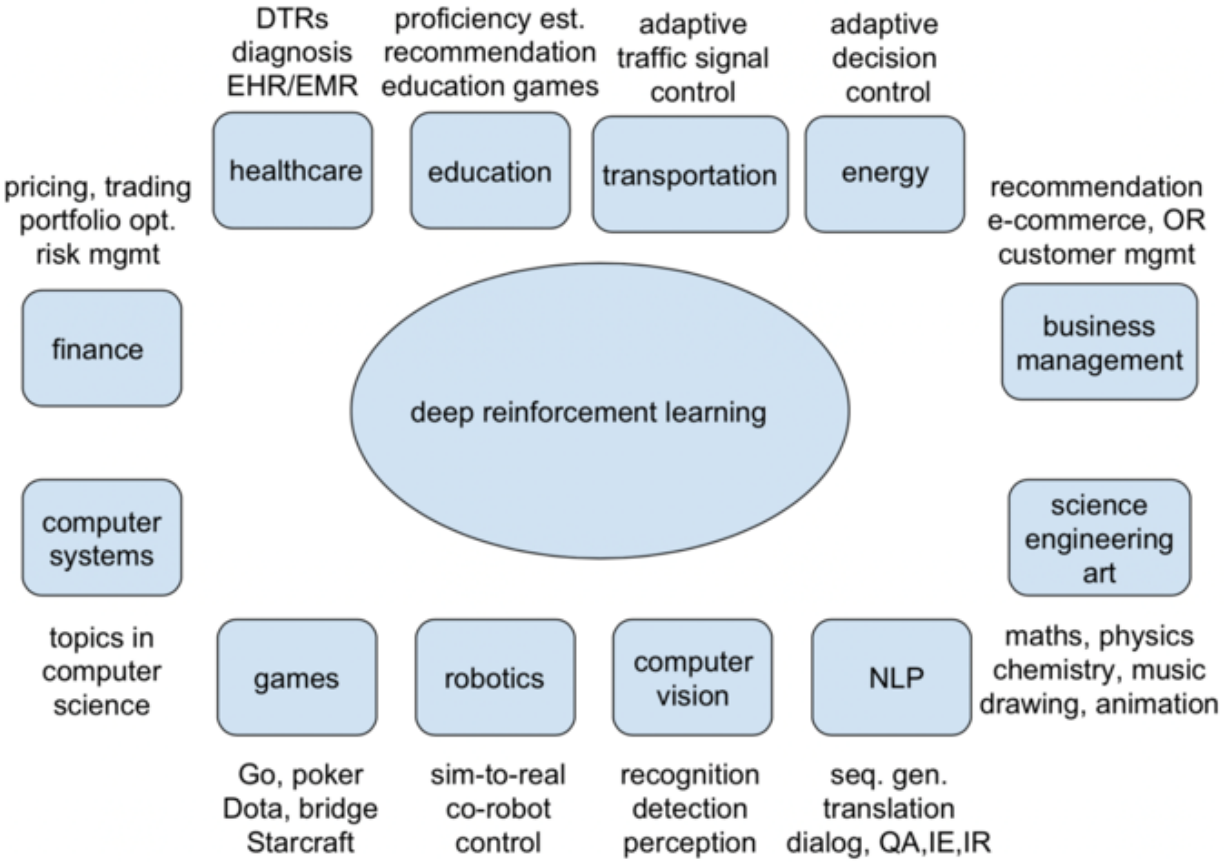
1/19/2023

Overview

- In this project, you will have an opportunity to apply the DRL techniques to some more interesting problems.
  - You can choose any problem that you are interested in, but within the domain of RL
  - Get some data related to the task
  - Apply some RL algorithms to your data
  - Evaluate and compare your algorithms
  - Present your results and demo to the whole class
  - Finally, submit a report

Project Ideas

- Applications
  - Apply a few existing RL algorithms to a domain of your interest



Project Ideas

- New architectures or algorithms
  - Design new RL architectures or algorithms for new or old problems
- Theory*
  - Theoretically analyze existing RL algorithms

Stage 1: Form Groups

- Deadline: 1/27/2022 (by 11:59 pm)
- 1 PhD student
- Up to 2 MS students
- Can combine the project with your own research (computer vision, NLP, biology,...). In this case, you will work on your own.

- Where to submit: email TA (sgaddam5@student.gsu.edu)
- What to submit: Group members (names, email addresses)
- Points: 1 point

Stage 2: Project Proposal

- Deadline: 2/10/2022 (by 11:59 pm)
- Where to submit: iCollege
- What to submit: A 2-page proposal including
  - Problem and goal
    - What do you want to solve?
    - Why do you think it's important?
    - What results do you expect?
  - Formulate it into a RL task (for application-type project only)
    - What kind of data?
    - Potential RL algorithms?
  - Schedule: detailed plan of your project
- Points: 5 points
- Note: If necessary, I will discuss with some groups about their proposals in the following week

Stage 3: Midpoint Check

- Deadline: 3/10/2022 (by 11:59 pm)
- Where to submit: iCollege
- What to submit:
  - A preliminary 4-page report
  - Discuss about progress
  - Issues and difficulties you have met
- Points: 2 points
- Note: If necessary, I will discuss with some groups about their progress in the following week

Stage 4: Presentation

- When: 4/18, 4/20, 4/25 or more (tentative)
- Who to present: whole class
- How long to present: 15 mins (including QA)
- In what form: slides + demo
  - Problem introduction, formulation, algorithms, experiment results, demo, etc.
  - Credits: 5 points
  - Peer review

Stage 5: Final Report

- Deadline: 4/28/2022 (by 11:59 pm)
- Where to submit: iCollege
- What to submit: At least 6-page font size 11 report
  - Problem introduction, formulation, algorithms, experiment results, etc.
  - A table describing each team member's contributions
- Points: 17 + 2 points

Grading

- Total: 30 points of regular credit and 2 points of extra credit
  - Group formation (1 point)
  - Proposal (5 points)
  - Midpoint check (2 points)
  - Presentation (5 points)
  - Final report (17 points)

- 2 extra points
  - Novelty of the problem
  - New RL algorithm, or architecture
  - Publishable

Grading

- Collaboration Rules
  - Each member in a group gets the same score (encourage teamwork)
    - Exception: a team member has the right to claim someone as a free rider, and we will lower his/her score
  - A table describing your contributions. For example:

Task	People
1. Collecting and preprocessing data	Student A
2. Implementing Algorithm 1	Student B
3. Implementing Algorithm 2	Student A
4. Evaluating and comparing algorithms	Student B
5. Slides, demo and Presentation	Student A, B
6. Writing report	Student A, B

Resources and References

- NeuroIPS/ICML/ICLR/CVPR/ICCV/ECCV/ICRA
- arXiv
- Talk to me for pointers ☺