Dear Students,

For the Project of DRL course, you need to choose an agent and fulfill all the requirements. Follow the explanations clearly as follows. For the projects, you can work independently or in groups of a maximum of three people. Note that the contribution of each group member must be clear and separated in presentation, and low contribution can affect individual marks.

Important Dates:

- ✓ You will have more time to work on the final project's presentation on December 27th, 2024 (after exam week).
- ✓ The project topic presentation and teams will be on December 6th (upload slides in Moodle).
- ✓ If you finish your project earlier, you can present only on December 18th – 20th, and you must contact us by email and set a time at least 2 days in advance (important note that only one-time presentation is allowed).

Note: Use any AI tools like Chat-GPT only as learning is allowed, and they must not be used for writing code or reports and papers.

Project:

- ✓ Implement a DQL-based algorithm, e.g., Open-AI gymnasium toolkit, based on a modified problem that you choose (in a discreet environment, you can also discretize a continuous problem yourself). Note that other environments or practical problems can be accepted (the reason should be presented well).
- ✓ You need to define your unique scenario that is not exactly on the internet (it can be based on one existing environment, but the agent's objectives should be different).
- ✓ You Present the team members, idea, state space, action space, reward, and your environment idea (changes in existing problem) in PowerPoint on December 6th.
- ✓ Using third-party environments in the Open-AI gymnasium is allowed under the same conditions (change the agent objective in the problem by at least 30%).

Minimum Expected results and materials for Final presentation:

- Implementation Codes in Python.
- Clear Results plots with a short discussion.
- Presentation PowerPoint and presentation in class on specified dates.
  - ➢ Problems' Idea, environment, state, action space, reward function, algorithm details.
  - ➢ Video of working solution.
  - ➢ Run the code and results during presentation time if asked.

• A Three-pages report including the following sections.

- ✓ Problem Title
- ✓ Problem introduction (with references to similar problems).
- ✓ Your work differs from Existing studies.
- ✓ Results plots and discussion about results.
  - o plot reward function convergence vs. episodes
  - o plot success rate of an agent or final error vs. episodes
  - o Plot loss of the Deep network