# ECE 277, FALL 2020
# GPU Programming
## Department of Electrical and Computer Engineering
## University of California, San Diego

**Midterm Examination: High performance Multiagent Q-learning.**

1. Download Midterm_exam.zip from the class website.

2. Create a Visual Studio (VS) solution file.

3. Add your agent codes under "Qagent" directory and modify the CmakeList.txt properly. (You shouldn't modify any other things)

4. Upgrade your lab3 multi-agents to achieve the highest positive rewards. **You should only use the Q-learning algorithm covered in the lecture**.

5. **Write a report about how to enhance your agents**
   <span style="color:red">(Itemize every enhancement in details, but every enhancement is taken into account only one time even if you used it multiple times in your code.)</span>.

6. Do not include your code in your report. Instead, you should specify the line number of the enhancement in your code.

7. The number of agents: 512

8. The size of the mine game environment: $46 \times 46$

9. Training time: 4 minutes

10. Inactive agents should not update Q-table and action buffer like lab3.

11. Test time: until all the agents become inactive status or up to one minute.

12. If you run your code in "Debug Mode", there is no time limitation (only debugging purpose).

13. If you run your code in "Release Mode", the environment switches "test mode" after 4 minutes and it finishes the program after all agents become inactive state or one minute.

14. **Your code should not utilize any time related information (time and the number of episodes etc. refer to the exam_Q&A.pdf)**.

15. Create a single zip file to your agent files, and upload **the file with your report** by <span style="color:red">Nov 19th 11:59 pm.</span>

    **No late submission. If you miss the submission deadline, your exam. score is zero**

16. 15 points are assigned to your report, and 10 points are assigned to your rank.

17. **Any uncompilable code or not runnable code will be penalized (-9pt.)**

18. The rank is based on the total positive rewards after two runs. (I'll add an evaluation code to your submitted codes.)

19. The environment map for the evaluation is the same to all the students.

20. 0.5 point decreases every rank up to 3 points (the minimum rank points are 3 points as long as you are in the competition pool).