

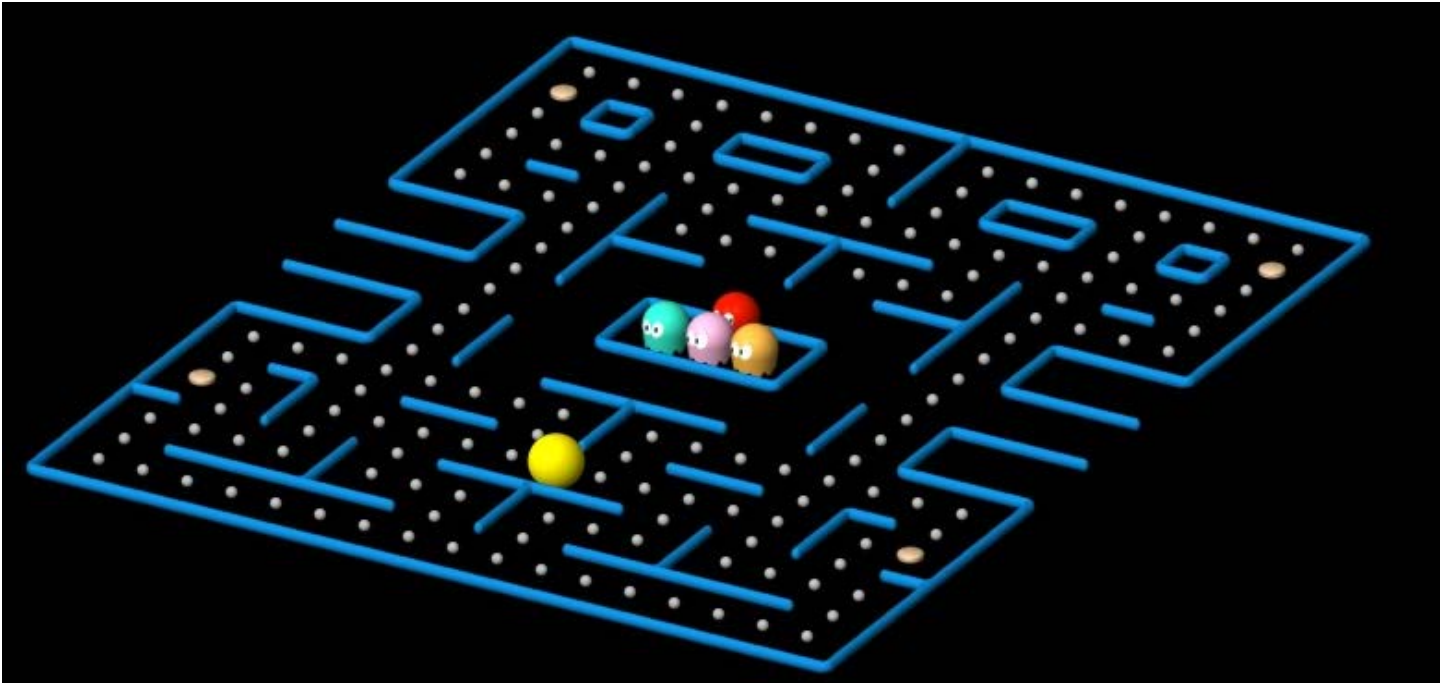
# Class Final Project

## 3D Pac-Man

(300 pts)

Section	Due Date
89313 - ECE 4122 - A	Nov 24 <sup>th</sup> , 2020 by 11:59 PM
89314 - ECE 6122 - A	Nov 24 <sup>th</sup> , 2020 by 11:59 PM
89340 - ECE 6122 – Q, QSZ, Q3	Nov 24 <sup>th</sup> , 2020 by 11:59 PM

[www.freewebarcade.com/game/3d-pacman/](http://www.freewebarcade.com/game/3d-pacman/)



### Final Project Requirements:

1. Using the code and maze from Lab4 you need to animate the ghosts and pac-man. For the final project you can develop and run your code either on PACE-ICE or your local machine.
  - a. Submit video(s) showing your project running and all of the required behaviors. Submit all code files. This will allow you to program and run on your local machine. You will need to include a “readme” text file describing the steps needed to compile and run your code
    - i. Include what OS was used and any third-party libraries along with links.
    - ii. The TAs and I must be able to reproduce what is seen in the video, so it is your responsibility to provide us with instructions on how to build your code.
    - iii. It is also important that your code is well commented and easy to follow and understand.

- b. If you do not submit video(s), then the TAs will need to be able to compile and run your code, therefore the software must compile and run on the PACE-ICE system.
- 2. Submit all your code files into a single zip file with the name **Final\_Project.zip**
- 3. Your code must implement the following:
  - a. Custom classes:
    - i. **ECE\_Ghost** class for drawing the four ghosts and determining their motion
      - 1. Each ghost needs to run in it's own thread
      - 2. Each ghost needs to continuously determine the path to pursue pac-man.
      - 3. Ghost can be made with a sphere for a head and cylinder for body
      - 4. Each ghost needs to have a unique color
        - a. Red, green, orange, pink
      - 5. Ghost's motion must be restricted by maze walls.
      - 6. The ghost need to use a shortest path algorithm to determine the path towards pac-man.
    - ii. **ECE\_Pacman** class for drawing and controlling pac-man
      - 1. Pac-man can be drawn as a yellow sphere
      - 2. Pac-main is controlled in the main thread using the
        - a. Left, right, up, down arrow keys to change pac-man's direction
- 4. Game rules
  - a. The game starts as soon as the user presses any key.
  - b. The game ends when all the coins and powerup are consumed or pac-man dies three times.
  - c. When pac-man dies he and the ghosts are placed back at their starting locations.
  - d. When a ghost dies it must wait ~5 seconds to be respawned in the ghost home location.
  - e. Only one ghost every ~2 seconds can be released from the ghost home location.
  - f. Once pac-man consumes a power up he can kill ghosts for ~5 seconds. Change ghost color to white to indicate condition and then back to normal color. Ghosts should run away from pac-man during this time.

## Grading Rubric

### AUTOMATIC GRADING POINT DEDUCTIONS PER PROBLEM:

Element	Percentage Deduction	Details
Ghosts movement in maze	Up to 20%	Ghosts move about the maze without going through walls.
Ghosts pursue pac-man.	Up to 20%	The ghost should travel towards pac-man and always be in motion.
Pac-man motion	Up to 30%	Pac-man moves about the maze without going through walls and consumes objects (20%). Up, down, left, right arrow key change pac-man's direction (10%).
Pac-man/ghost interactions	Up to 20%	Once pac-man consumes a power up he can kill ghost for 5 seconds. Change ghost color to white to indicate condition and then back to normal color. Ghosts should run away from pac-man during this time.
Camera location and shading	Up to 10 %	Camera location should be similar to the location shown in image at start of assignment. Object's should have specular reflections to enhance 3D appearance.
Clear Self-Documenting Coding Styles	10%-25%	This can include incorrect indentation, using unclear variable names, unclear/missing comments, or compiling with warnings. (See Appendix A)

## LATE POLICY

**Late final projects will not be accepted. All projects must be submitted by midnight Nov 24<sup>th</sup>.**