Computer Graphics, CSL781

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Project Proposal

3D PACMAN

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Objective: The objective of the project is to explore graphics programming and implement the classic pacman game in opengl with some advanced features.

Standard Gameplay: The player controls Pac-Man through a maze, eating pac-dots. When all pac-dots are eaten, Pac-Man is taken to the next stage. Four enemies roam the maze, trying to catch Pac-Man. If an enemy touches Pac-Man, a life is lost and the Pac-Man itself withers and dies. When all lives have been lost, the game ends.

Different colored ghost use different algorithm to chase after Pac-Man. To save itself from ghosts Pac-Man can use warp gates.

There are various power ups available which can be used to at once destroy the ghost so that they return to a central box. Eating power pellets leads to change in ghosts' color.

Expected View:

Special Effects or Postprocessing: Implementing pixel shaders using GLSL or any other appropriate shading language. The shader would implement appropriate interpolation technique and illumination model algorithm.

Implementation:
- **Models for Pacman, Ghosts, pac-dots and powerups:** As all models are made of basic shapes so this can be done in opengl itself and writing different .obj file to be used later.
- **Floor:** Floor can be made by simple texture mapping from an input file.
- **Lighting, Shadows and Reflection:** Game will include animation, lighting, reflections and shadows to give a glassy and realistic look to the game.
- **Camera:** The camera view would be third person perspective. The third person view would be rendered through either top view or tracking (camera behind the Pac-Man).
- **Intelligence:** Complete maze can be modeled as an undirected graph. So a ghost can decide its path that will lead it to pacman. This we can implement using some heuristic search. eg. A* search. Increasing intelligence would involve targeted chasing rather than the usual algorithms.

*Extra Features to be implemented if timeline permits.
- **Extra Power Ups:**
  - *Mega Jump:* Allows pacman to jump over ghosts for some limited time.
  - *Tunneling:* Ability to walk through walls for some limited time.
  - *ThunderGun: Ability to shoot forward for some limited time.*
- **Multiplayer game play:** with one Pac-Man and one Pac-Woman.
- **Height Map:** Providing a height map to the maze rather than having a plane maze.
- **Sound Effects:** that will be triggered on different actions of pacman.