Game Mod Programming

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Academic Integrity

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The latest version of this can be found here:
https://www5.njit.edu/policies/sites/policies/files/NJIT-University-Policy-on-Academic-Integrity.pdf

Objective

This class will be a hands-on, project focused course. This class will show how to work within an established game engine and how to modify the engine and game logic to create your own projects. Students will work on 2 separate major project milestones, and complete a few general exercises along the way. This course will also touch on other tangential topics and tools that are useful for software developing, including source control, documentation generation and best practices.

Use of Artificial Intelligence

All work submitted is expected to be the result of your efforts and your efforts alone. Use of AI is not permitted for submitted works.

Modality

This course is offered in-person twice a week, with in-person office hours. In addition to the in-person component of the course, a Discord server has been set up for this course as a supplemental way to communicate with your classmates and the professor. The course also uses canvas to provide major announcements, a place to host the syllabus, and for the submission of assignments and documentation for the project. You are responsible for keeping up to date with your email, discord, and canvas.

Grading

- Exercises (about 3): 10%
- Scrum Journal: 10%
- Project Proposals : 5%
- Mid Term Design Challenge: 15%
- Mid-Term Project : 20%
- Final Project : 25 %
- Final Design Challenge : 15%

Course Materials

- Canvas
- Discord
  - MIXR Lab: https://discord.gg/VGVQ3nrG5Y
  - Class: https://discord.gg/3geGjuSeJf
- Quake 2 from Id Software (available on Steam, GOG)
- Quake 2 Source: https://github.com/engineerOfLies/quake2-full.git
- Quake 4 from Id Software (available on Steam, GOG)
- Quake 4 source: https://github.com/engineerOfLies/Game-Mod-Q4.git
- MS Visual Studio (available from IST)
- A Github Account
- GIT-Bash
- Google / duck duck go / ask jeeves?
- Stack Overflow

Submission Criteria

All projects for the class must follow a set of submission guidelines to be eligible for grading. All projects must include the following:

- Project Proposal: The proposal functions as our contract for your project. You put forth the vision for your project and we will discuss together what will be expected at grading time during a scheduled one-on-one meeting. You are to post a PDF of your design document to canvas. Specific deliverables will be agreed upon and posted to your canvas project thread. This is how your project will be graded. Without an approved proposal your project cannot be graded (and will default to a 0).
- Presentation: All projects must be presented for grading purposes. This will be done during the midterm and final periods. Be sure your computer is able to project in the classroom prior to presentations.
- Github Submission: Provide the URL so I can clone into your repo to your canvas project thread. Please tag your branch with appropriate titles “midtermProject” / “finalProject” / “exercise#”. Please be sure to verify that your code provided is what generated the

submitted executable and that your changes are fully commented. Note: I will be reviewing your commit history, so commit often!

  - A “Readme” file with all additional instructions for setting up and playing your game.
  - Compiled library (may require git add -f gamex86.dll)

Late Policy

Any projects that are submitted late will have a penalty of 1 point (of its percent value towards your final grade) per day late. Any project more than 7 days late will not be considered for grading. No exceptions.

Course Topics

- C / C++ Programming Basics
- Version Control with GIT
- Agile Development
- Game Engine Architecture
- Project Setup in Visual Studio
- Id Tech Game Engines overview
- Quake 4 Content Management
- Entity Based Systems
- Items and Weapons
- Vector **Math**
- User Interfaces
- Advanced topics in C
- Finite State Machines
- Artificial Intelligence

Student Outcomes:

- Be able to setup a project in visual studio
- Be able to program in C++ and C
- Be able to make meaningful changes to the source code of the open source professional games looked at in this class
- Be able to edit the user interface of the games in question
- Be able to describe the architecture of a game engine
- Be able to design a workable approach to implement new game features for the games in question

Milestones

- Week 1: Introduction
- Week 2: Visual Studio & Project Setup
  - Midterm Project Proposal Due / Exercise 1 Due
  - Scrum Journals Created by each student
- Week 3: Entity Class Architecture, User Interface

  - 1 on 1 meetings
  - Scrum Journal Updates
- Week 4: Definition Files and Parsing Config Data
  - Exercise 2 Due
  - Scrum Journal Updates
- Week 5: Player and Item Logic
  - At least 2 personal deliverables should be completed
  - Scrum Journal Updates
- Week 6: Spawning and AI
  - at least 8 of the total deliverables should be completed
  - Scrum Journal Updates
  - Midterm Project Presentations scheduled
- Week 7: Midterm Project Presentations
- Week 8: Overview of the scope of final project
  - Midterm Design Challenge
- Week 9: Quake 2 Setup and Overview
  - Final Project Proposal Due / 1 on 1 Meetings
  - Scrum Journal Updates
- Week 10: Edicts and Clients
  - Exercise 3 Due
  - Scrum Journal Updates
- Week 11: Items and AI
  - At least 1 personal deliverable should be completed
  - Scrum Journal Updates
- Week 12: Spawning and UI
  - At least 2 deliverables should be completed
  - Scrum Journal Updates
- Week 13: Project Support
  - at least 8 of the total deliverables should be completed
  - Scrum Journal Updates
- Week 14: Final Design Challenge / Presentations
  - Scrum journals submitted along with all deliverables