CSci 4455

Computer Game Design and Programming

Overview

Principles, techniques, and design of computer games. Graphic game engines, modeling, motion, AI and interaction; sound design and synthesis; real-time software and hardware issues. May be taken for graduate credit.

Goals

To create a complete, playable game through a compressed, simulated game development cycle.

Evaluation

1) The final grade will be based on how much you have learned during this course, not how much you knew when you started.

2) In-class, in-person contribution and interaction sets this class apart from online courses. The creative aspect of game design will be driven from this interaction.

3) The grading scheme below is one of the tools for accurate, fair assessment of how much you have learned in the class. There is a 10% late submission fee per day.

- 35% class contribution/collaboration (If you have not contributed to class discussions, you should not expect a grade above C)
- 35% assignments/quizzes
- 30% final project (Festival of Animation and publication in App Store)

Prerequisites

Logical mind. Non-Computer Science majors are encouraged to enroll. Some of our best games were created by non-majors.

Textbooks

This class does not require textbooks.

Final Project Requirements

- [ ] A complete game must be created per person. No team project. Individual Project
- [ ] Due Date: 4:00pm November 6, 2015 App Store ready

Compatibility

- [ ] Do not use keyboard functions. Touch Only.
- [ ] Multi-touch compatible. If I can only press one button at a time, your project will not be accepted.
- [ ] iOS/App Store compatible w/unique name in App Store
  - [ ] DO NOT use keyboard_ functions
  - [ ] https://developer.apple.com/appstore/resources/approval/guidelines.html

Screens (or room) and Levels:

- [ ] Every room must be either 1136x640 or 640x1136 in size
- [ ] Title Screen
  - [ ] Menu Item: Play
  - [ ] Menu Item: Credit
  - [ ] To visually convey what your game is all about
  - [ ] must **NOT** have a menu item that exits the game
- [ ] Game-Over Screen
- [ ] Level Select Screen
- [ ] Ten different levels must be created
  - [ ] Level 1 to 6 must be fool-proof easy
    - [ ] Each tutorial level must introduce only one new feature at a time.
  - [ ] Level 7-10 must be progressively more difficult little by little.
- [ ] Game creator (student) must be not rely on written instruction or readme screen/file.

Visual Elements

- [ ] Any touchable object must be larger than 64x64 pixels. 128x128 is recommended.
- [ ] Fonts must be bigger than 30 points
- [ ] No pixelation. No scaling. One exception is momentary pixelation while zooming animation for a fraction of a second.

Source code naming requirements:

- [ ] Must be written in Game Maker Studio
- [ ] Only gml module can be used. e.g. must not use DLL or JavaScript modules
- [ ] Rooms must start with rm_
- [ ] Sprites must start with spr_

- [ ] Objects must start with obj_
- [ ] All assets must be properly, meaningfully named. If names such as sprinte14, sound2 are found, the project will not be accepted.
- [ ] Proper orientation must be set. e.g. portrait, landscape

Assets (graphics, sound effects, background music, sprites, code, etc.)

- [ ] All assets must be original, created by you.
- [ ] All assets that are not created by you must be properly licensed and credited.
  - [ ] Licensed (with a written permission from the owner) This include CC, GPL, etc.
  - [ ] Credited in Credit Screen, which must state each asset in the following format:
    - [ ] Asset Name: Source (Licensor)
  - [ ] Failure to do so will result in F as the final grade. will be reported according to GWU and CS department's policy on plagerism.

Sound Effects and Background Music

- [ ] Every action must accompany sound effects as an aural feedback.
- [ ] Background music in mp3 format

Project Submission

- [ ] Submit on the website http://www.gwgamedev.com
- [ ] Email submission will not be accepted.

Preparing Directory Structure (the trailing slash incidate directory):

- [ ] YourFullName-YourGameName/
  - [ ] icons/
    - [ ] .png format of 1024x1024 pixel in size
    - [ ] Your own creation. No scaled image
    - [ ] Do not use text.
  - [ ] YourGameName.gmx/
  - [ ] screenshot/
    - [ ] title.png
    - [ ] gameplay1.png, gameplay2.png,…
    - [ ] same resolution as your game
    - [ ] Remove window borders and title bars
  - [ ] assets/
    - [ ] source audio, graphics files
  - [ ] description.txt: 20-100 words.
- [ ] Submit a single .zip file that contains the above directory strcuture
  - [ ] Name it: YourFullName-YourGameName.zip

☐ User Experience: DO NOT include or rely on an instruction/email/readme/help. If I have to read the instruction to play your game, 0 points will be given.

Class Summary

Unit 1: Genre Programming

Shooter

      Introduction to Game Programming

Platformer

      Physics Implementation

Puzzle

      Algorithm Design

Unit 2: Mobile Considerations

Multi-Touch

Gestures

Tilt

Testing Mobile Application

Unit 3: Level Design

Tutorial Levels

Progressively More Difficult Levels

CAR (Challenge-Action-Reward) Cycle

Unit 4: User Experience Design

Consistent User Interface

Device Limitation e.g. Touchable Size

Level Chooser

Pause Function

Unit 5: Modular Programming

Abstraction

Module

Unit 6: Creative Design

Inspiration

Gameplay Design

Abstraction and Gamification

Graphics

Audio

Animation