Computer Game Design and Programming

Course and Contact Information

Course: Department of Computer Science, Computer Game Design and Programming CSci 4455-10 81717
Semester: Fall 2017
Meeting time: Friday 6:10-8:40pm (08/28/17 - 12/11/17)
Location: Tompkins Hall 405

Instructor

Name: Juman Byun, PhD, MBA
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Phone:
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Office hours: by appointment and/or Slack

Bulletin Course Description

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.

Prerequisites

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

No Textbook Purchase Required

- All materials will be provided in class

Author	Title	Edition
Juman Byun	**Mobile Game Development**	**1st ed.**

Learning Outcomes:

As a result of completing this course, students will be able to:

1. create a playable computer game
2. identify game play genres and patterns gamers are familiar with
3. produce multiple game levels with a low barrier to entry and increasing difficulty for prolonged gamer attention
4. evaluate gamification potential of daily activities, events and work
5. synthesize simulation models for game play
6. visualize the simulation model in small real estate mobile screens
7. design touch-based UI (user interface) that is most appropriate for the given game play
8. integrate game genres into most engaging game play and user experience (UX)

Class Schedule

Date	Topic(s) and readings	Assignment(s) Due
Week 1	Game genre analysis: shooter, single screen Computer science concept: event-driven programming Game play design Simulation model (input, model, output) Sprite Object Game play screen (size: 1136x640) programming Reading: Space Invaders (1978) https://youtu.be/axlx3o0codc	Due 5pm next week A playable shooter
Week 2	Game genre analysis: action adventure A complete game Computer science concept: variable Background tile design Title screen Credit button Play button Credit screen (size: 1136x640) Game play screen **Pause button** Pause object Paused variable Pause implementation Other ideas: enemy shoots back towards fighterjet, random direction movement of enemy, strong enemy that can take multiple bullets Reading: Castle Wolfenstein (1981) https://youtu.be/SV5VzYHEC0c	Due 5pm next week A complete game: 1. A title screen with a play button and a credit button 2. A credit screen with the game developer's headshot 3. A game play screen 4. Functioning pause button Do **not** place an exit program code or button
Week 3	Game genre analysis: scrolling shooter score display in the controller Animation, explosion of enemy, explosion of fighterjet, View Mini map CAR (Challenge Action Reward) Cycle of Games Score	More powerful enemy Due 5pm next week A scrolling shooter with three complete levels

	Camera move Power-up items Multiple levels **Level Chooser** Reading: Defender (1981) https://youtu.be/X-L80KM9gM8	
Week 4	Input devices Touch-based UI Whole-screen UI Gamepad (joystick) Mouse Touch-screen	Due 5pm next week A scrolling shooter with three complete levels Plus, touch control Please remove all keyboard controls.
Week 5	Game genre analysis: action platformer Story-telling Elements of immersion Parallax scrolling Pre-rendered 3D Touch control of platformer character – autorun + jump, on-screen gamepad, touch to run + gesture Graphics asset creation Vector-based image **Animation** Reading: Karateka (1984) https://youtu.be/GHNT7mR-8d0 http://www.usgamer.net/articles/five-critical-moments-in-platform-game-history	Due 5pm next week A complete scrolling shooter with all graphics replaced with vector images
Week 6	Game genre analysis: platformer Game physics Reading: Mario Bros. (1983) Load Runner for Apple II (1983) https://youtu.be/vzimJopP5rE H.E.R.O (1984) Super Mario Bros (1985)	Due 5pm next week A platformer with one complete level
Week 7	Platformer continued Interactive props Mixed genre game Cross-platform development issues	
Week 8	Game genre analysis: grid puzzle Reading: Candy Crush (2012) Computer science concept: array, constant Local multi-player game Reading: Bomberman (1983, 1985)	Due 5pm next week A complete grid puzzle game

Week 9	Game genre analysis: platformer Sound Effects Music composition Reading: Mobile GarageBand tutorial	
Week 10	Game genre analysis: real-time strategy Inspiration Abstraction Repeatability vs. variability Gamification Game play design Reading: Lemmings (1991) https://youtu.be/xIuxB1oR2WQ StarCraft (1998)	Due 5pm next week Five to eight story boards for a new game
Week 11	Game business sustainability Non-free In-game purchases Freemium model Gamification of work Reading: Foldit	Due 5pm next week Sustainable business model
Week 12	Game genre analysis: puzzle-platform Evaluation of games Risk and benefit analysis of novel game play Reading: Portal (2007)	Due Tuesday 8am next week Revised game
Week 13	Game genre analysis: first-person shooter Evaluation of games continued Wolfenstein 3D, released in 1992 Reading: History of FPS https://youtu.be/aipGP5oAuWQ Maze War (1974) https://youtu.be/G-GY3bO0YsI Wolfenstein 3D (1992)	Due Tuesday 8am next week Revised game
Week 14	Game genre analysis: stealth Reading: Tom Clancy's Splinter Cell (2002)	
NOTE: In accordance with university policy, the final exam will be given during the final exam period and not the last week of the semester		

Assignments and Grades

Grading

List what will be counted and percentages. For example:

- assignments/pop quizzes (70%),
- final presentation at the Festival of Animation (20%)
- class participation/attendance (10%)

University Policies

University Policy on Religious Holidays

1. Students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance.
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations.
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities

Support for Students Outside the Classroom

Disability Support Services (DSS)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: gwired.gwu.edu/dss/

Mental Health Services 202-994-5300
The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. counselingcenter.gwu.edu/

Academic Integrity Code

Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For the remainder of the code, see: studentconduct.gwu.edu/code-academic-integrity