CSCI-426: Game Prototyping

Basic Information

Place and time: EGG 108, Wednesdays 7:00 -10:20 pm

Credit Units: 4 – students attend one lecture and one lab per week

Instructors:

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Office hours: By appointment

Course homepage: [here]

Prerequisites: None

Course Description and Objectives

Description

This is an advanced course covering the process of Game Prototyping. Computer Science students will learn modern skills (Design/Engineering/Production) for developing sophisticated games rapidly from concept to finished prototype.

The student will:

- Understand how development is a combination of Design, Engineering, and Production.
- Understand the difference between a developer's view and a consumer's view, and learn about rapid iteration.
- Learn game prototyping topics:
  - ➔ Game Development Overview
  - ➔ Core Experience Design
  - ➔ Rapid Paper Prototyping
  - ➔ Unity 3D Development Platform
  - ➔ Development steps to Quick Play
  - ➔ Focused Playtesting
  - ➔ Rapid Iteration
  - ➔ Gameplay Optimization
  - ➔ Project Presentation

- Critique and analyze classmates' games via formal playtests.

At the end of the course each student will have an advanced game prototype that demonstrates mastery of the topics taught in the course.

Objectives

Upon successful completion of this course, each student is expected to be able to:

- Demonstrate mastery of class material via in-class exercises, prototyping, playtesting, and quizzes
- Deliver game prototype that compels users and complies with a range of constraints and shows promise for full production as a next step. Prototype using non-digital materials as well as Unity 3D.
- Conduct playtest sessions which elicit formal feedback from playtesters that can be used to improve the quality of the play experience (no emphasis on production values).
- Iterate on prototype to improve player experience as measured by playtester feedback and instructor judgment with proficiency
- Present interactive game concepts with clarity

Textbooks and Course Materials

No Textbook requirements

Supplies: Students will be provided with software tools and non-digital materials by the instructor. For the paper prototyping assignments students should expect to purchase some basic art supplies - such as dice, tokens, scissors, glue, colored pencils, etc.

Grading

Students will be evaluated as follows:

Milestones (4)	10%
Quizzes (2)	10%
In-Class Design Exercises	10%
Playtests	10%
Final Prototype Proposal	5%
Final Prototype Design Document	10%
Final Prototype Production Schedule	10%
Final Prototype Presentation/Demo	35%
Total	**100%**

Course Outline

Date	Topic
Week 1	**Lecture 1:** Overview and Introduction - Our opening session will provide an overview of the course, the grading criteria, and other administrative details. After that, we'll discuss the partially overlapping aspects of game prototyping for the purposes of this course: rapid design, quick step engineering, and highly focused production, and how they interrelate to modern rapid Prototyping. We will lay out course mechanics: lectures, quizzes, reading, in-class exercises, playtesting/critiquing*, and final project. We will briefly discuss the topics that will be presented in the course. **In-Class Exercise**: Examples of Card and Paper Prototyping **Assignment:** Get supplies for Paper Prototyping next week - 3x5 cards, colored pens, dice and other props. Begin thinking about a small game prototype idea for the semester.
Week 2	**Lecture 2:** Game Design and Prototyping I - Exploring the Core principles of game design and how modern rapid prototyping has changed the process. Learn to define the core experience, using verbs to describe the player's actions, the player compulsion loop. - Develop ways to demonstrate key aspects of game design features using paper and props. **In-Class Exercise**: Divide into groups and create paper example of a simple design concept. **Assignment:** Create Game Prototype Proposal "One Pager" to be presented in class next week.
Week 3	**Lecture 3:** Game Design and Prototyping II - Learnings from past projects - Crash Bandicoot, Uncharted, Overwatch, Pokemon GO. - Understanding core principles of "fun" - compulsion loops, play engines, choices that make "simple, hot, and deep" gameplay.

	- Further defining the specialized elements and different approaches for prototyping mobile, console, web, and PC games. - Other team tools - Adobe Illustrator, Slack, etc. **In-Class Exercise**: Present and critique prototype concepts. **Assignment**: Iterate on design concept, start thinking about scope and implementation. Present a valid scope.

Week 4	**Guest Speaker 1** Prominent industry professional will come in and speak to the class about practical application if what they are learning. A presentation will be followed by a student Q&A. **Lecture 4:** <u>From Paper to Digital - Prototyping Production</u> - Continue to explore the various tools used for prototyping, including Spreadsheet Prototyping and the Unity 3D environment. - Iteration steps of paper prototyping. How do the paper prototypes feel so far? Questions? Concerns? How can your game idea transition to paper to a digital form soon? **In class exercise:** Instructors reveal which paper prototypes have been selected to convert to digital and why. Class then divides into teams around the selected prototypes and begins developing priority list of features for your digital prototype, engineering estimates, prototyping production plan. Begin to make the switch from paper to digital Unity 3D development. **Assignment:** Assignment: Switch to Unity for continuing development of the selected Paper Prototypes. Prepare your team members to take on assignments for helping develop the new digital version moving forward - this includes engineering, art, design, and sfx.
	Note: From this week forward, students are encouraged to use the exercises to support the development of their final prototypes, and to work ahead on the in-depth assignments before the in-class exercise. The end of each exercise period will be devoted to presentation and critique (and sometimes playtesting).

Week 5	**Lecture 5:** The Vertical Slice - Talk about in-depth game production processes and ideologies for reaching a quick vertical slice for proof of concept. Agile/Waterfall. - Rapid Iteration. Quick steps from concept, to code, to screen. - Min Viable Spec approach - An in depth introduction to, and analysis of, the elements that make up a 3D game, and how the development process is different from making a 2D game, particularly when prototyping. **In-Class Exercise:** Get back into your groups and limit your prototype scope to a vertical slice that shows the significant core play loops for quick evaluation and proof of concept. **Assignment:** Design (not code) a vertical slice spec. Schedule this spec and assign parts to each team member. If you are missing a skill set in your team, find it some other way. **Final Vertical Slice Prototype Design Document due at end of class, presentation in Lab session**
Week 6	**Lecture 6:** Developing Game Worlds for Rapid Prototyping - Learn how to create simple yet effective systems to immerse players in the world and experience you are selling them. How community is the glue, and games are a social phenomenon. - The engineering view of how to develop game worlds in Unity 3D. Use the game base created earlier in the term. - Learn shortcuts to develop your game world as an object /environment but also as an agent acting upon itself and its inhabitants. **In-Class Exercise:** Game World Vocabulary Discuss ways to “frame the game” so that the player feels immersed,focused (like a picture frame around art) and ultimately moved and fulfilled. **Assignment:** How can these theories and ideas be applied to the prototypes under development?
Week 7	**Lecture 7:** Focused Playtesting Techniques to Iterate for Success

	- Learn how to create and execute test plans that reveal core aspects of your players experiences and the key “fun factors” as well as the dangerous “friction” that turns players off. - Game Development is first and foremost an iterative process, but before you can take steps to improve a play experience, you need to know what’s wrong and what’s right at a very fundamental level. - Learn proper playtest Observation, How to create insightful Player Questionnaires and Test Questions, making detailed Test Plans. **In-Class Exercise:** Assess current prototype game features by forming into groups and playtesting the prototypes under development, observing play and taking notes, and then asking detailed questions from the players about what works and what does not. **Assignment:** Develop a data logging system that can enable analysis of gameplay and player state over and over in subsequent playtests. (Define the “Success Metrics” for the current prototype each student is working on.)
Week 8	**Lecture 8:** Alpha Apocalypse - Now that the teams are deep into their prototyping development and have some test data, hidden problems not seen in the early paper designs are beginning to reveal themselves. Now is the time to act, not later! All games have problems in development. It’s how you respond that makes a game go from bad, to good, to great. - Learn how to iterate with extreme prejudice. The user experience is supreme, so how do you respond to the data and how do you measure “fun” over and over? **In-Class Exercise:** Lose a Feature - Find one feature in the game that can simplify the experience and still keep all the core fun intact. **Assignment:** Develop a detailed test plan for the remainder of your prototyping development process. Who plays? (Get your friends to sign up!) How often? What aspects of your game are you measuring and why?
Week 9	**Guest Speaker 2** Prominent industry professional will come in and speak to the class about practical application if what they are learning. A presentation will be followed by a student Q&A.

Week 10	**Lecture 9:** Integrating Premise and Narrative as Rocket Fuel This class will examine means and mechanisms where the game's premise and interactive narrative help frame and flesh out your prototype setup and play experience. Sometimes a narrative conceit will put the players in a certain "frame of mind" which encourages certain behaviors and attitudes that help drive the gameplay experience. Game designers learn to manipulate the player's state of mind, tone, or attitude for maximum emotional and play effect. **In-Class Exercise:** Group Discussion - How can a premise shift how players approach your prototype? How can you sue this to help make your game more fun and easier to understand and play? **Assignment:** Develop an engaging and thematic integration of narrative conceit or premise to further clarify your prototype's experience. Hone your Unity Prototype and class presentation for next week.
Week 11	**In Class Presentation of Prototype** **In-Class Exercise:** Teams will present the progress of their Unity Prototype and take questions and feedback from the entire class.
Week 12	**Lecture 10:** Honing the Core Loops Gameplay is all about compulsion and player satisfaction, which leads to stickiness and retention. Learn how the core loops of the game keep your players coming back for more and why. From last week's feedback, how can the core loops of your prototype be refined? **In-Class Exercise:** Looped In - Discussing the core loops of some of the most popular current games. Why are they so compelling? How can you learn from these giants in the industry? **Assignment:** Enhance your prototype core loops by integrating tried and true player compulsions, but with a new twist. Perfect formula - Something old, something new. Or put another way, ⅓ Proven, ⅓ Better, ⅓ New.
Week 13	**Lecture 11:** Using Data Analysis to Make a Better Game Data, especially big data, can reveal hidden patterns driving complex systems, including games. We will cover some examples of best practices for using data to help shape and improve gameplay, both before launch and after. Examples include Heat Mapping in Halo by Bungie, World of Warcraft Life/Death data analysis from past projects, A/B Testing, Pokemon GO statistical encounters, and others.

	In-Class Exercise: Change a Number, Change the Experience - How does the math affect the gameplay? The correlations and use of data to uncover hidden truths about the game and experience. **Assignment:** Define the core aspects and player activity of your prototype what you want and NEED to track. Turn them in next week.
Week 14	**Lecture 12:** Future Trends A glimpse into the future of the game prototyping, crowd funding, and state-of-the-art game development. What is trending in development? What new emerging technologies might change how games are built, distributed, and played? How can the students be prepared in upcoming job interviews about what is coming for game tech in the future?
Week 15	**Guest Speaker 3 & Wrap Up** Prominent industry professional will come in and speak to the class about practical application if what they are learning. A presentation will be followed by a student Q&A. Final Wrap Up, Feedback, Playtesting
Finals Week	**Presentation of Final Prototypes** Final write-up and brief demo of each prototype for instructors and entire class.

*Playtest/Critique Requirements:

Participating in in-class play tests is a requirement of the class. During each prototyping exercise and play test session, the class will break up into groups. In each group, each developer must quickly and clearly explain their game system to the play testers and lead them through a 20-minute play session.

After the group has played the game, the developer must lead a critique of their own game, eliciting as much feedback as possible from their play testers. At the end of the session, the developer must submit a critique document from the comments of the play testers. Both of these documents will be evaluated as part of the assignment grade.

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:
http://www.usc.edu/dept/publications/SCAMPUS/gov/
Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at:
http://www.usc.edu/student-affairs/SJACS/

Emergency Preparedness/Course Continuity in a Crisis

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will
announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.