[CSCI 426] Game Prototyping

Spring 2024

Lectures:	Wed 1:00pm-4:20pm	**Classroom:**	SCI 206
Instructor:	Andy Nealen	**Office**:	https://usc.zoom.us/my/nealen
Office Hours:	TBD	**E-mail**:	nealen@usc.edu

SA: Amari King (akking@usc.edu). **Office hours**: TBD

Syllabus: Game Prototyping is about designing, programming, and testing game ideas fast, and with as little effort as possible, while gaining knowledge about what does and does not work. This course is about experimental game design. This experimental mindset pertains to every aspect of the game, and these can be broadly characterized as the game system, control, visuals, audio, and resulting theme. We will explore these aspects through the creation of numerous very focused (video)game prototypes using Unity as our game engine/tool of choice. This will allow us to obtain a better understanding of what makes games appealing, and how game mechanics, systems, audiovisuals, and a variety of player experiences can be designed and iteratively improved by means of rapid prototyping and playtesting. The course is a combination of the technology, design, and philosophy underlying contemporary game creation, as well as the real-world implementation and design challenges faced by practicing game designers.

Target Audience: The course is intended for students who want to learn design practices and principles by which games can be conceived, prototyped, and developed within a one-semester course. Students will create weekly prototypes in teams of two, as well as complete one final team project. The course is a lot of (team)work, but it's also a lot of fun.

Prerequisites: There are no formal prerequisites, but basic programming skills are required. Artistic skills, or a willingness to learn them are a plus, as is familiarity with the Unity game engine.

Readings: We will discuss articles on experimental game design, game feel, game theory, and systems theory, as well as analyze a variety of successful videogames such as Getting Over It, Desert Golfing, Spelltower, Super Hexagon, Spelunky, Osmos, Canabalt, Flappy Bird, Tetris, and many more. A playing and reading list will be provided and expanded throughout the semester, and we will discuss some of the readings and many of the games in class.

Lectures: Topics include: an introduction to experimental game design, abstraction, prototyping, systems and feedback loops, input and control, space-time discretization, minimal graphic design, game feel, design patterns, human perception, game programming, etc. Each class meeting will consist of an approximately 60 minute lecture, followed by student presentations, critique, and discussion. Each class will end on the design prompt for the following week.

Projects: Students will design and implement 8 videogame prototypes in the first 10 weeks in weekly rotating teams of two (*prototype* phase). We will announce the teams and design prompt for the following week at the end of each class. Thereafter we will form teams of approx. 4 students around the best prototypes, followed by a final polish cycle of 4 weeks, in which these teams will iterate on one of the prototypes in order to polish and balance the game (*production* phase).

Expected Work: Students will design, implement, play-test, and present 8 prototypes in teams of two, and one final game project as a team of 4-6. We have chosen to use Unity for the prototypes,

and we will provide demos and demo code for the weekly design prompts as needed. Each of the prototypes as well as the final project will be presented by the students or team in class. It is expected that each class participant have 10 hours per week (outside of class) to work on their games.

Exams: There will be a final presentation by each team (including each team member) on the design and development of the final project. Aside of the final game, each team is expected to hand in a 2-page post-mortem document in the week after final presentation (finals week).

Grades: Each student will present and submit 8 prototypes, out of which we will grade the best 6, participate in a final project, and comment on games designed by their peers. The weighting is as follows: **Prototypes: 70%, Final Project/Polish: 20%, Class Participation: 10%**. I reserve the right to adjust the grading scale. To receive a good grade, you will need to perform well in the prototypes, final project, and in class participation. Please check the correctness of the grading and the posted scores immediately after we announce the availability of the scores. You will need to let me know about any grading issue within 7 days of me posting the score.

IMGD Attendance Policy: **Punctual attendance at all classes is mandatory**. Students arriving more than five minutes late to three classes, more than ten minutes late to a single class, or leaving early, will be marked as having an absence from class, unless prior permission has been obtained from the instructor. Three or more absences lower your grade one full grade point (for example, from A to B). If you have five or more absences, I will request that you withdraw from the course.

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. *We will strictly enforce the student conduct code and refer students to the Office of Academic Integrity for further review, should there be any suspicion of academic dishonesty, and suggest that they follow the recommended sanctions in case they should find that there was academic dishonesty.* We typically suggest an F as overall class grade as penalty, if asked. All details can be found here: `https://academicintegrity.usc.edu/`.

Problems and Concerns: At some point, you will have questions. For example, you might not be able to get code to run, there might be something in the lectures that you do not understand, and so on. In this case, we encourage you to post the question on the discord workspace and see whether someone can help you. If this approach does not generate the desired result, then the SA and I will be happy to help you in person during office hours. I do answer email but, unfortunately, often I will not manage to answer it on the same day. It is very important that you voice your concerns about any aspect of the class as soon as they arise. Please send an e-mail to the SA and myself, and/or come talk to me in person (or on Zoom).

Tentative Schedule: Weekly lectures and design prompts for the prototypes will be adjusted according to the current design topic most relevant to the student projects. Topics include prototyping, visual abstraction, game feel, systems design, feedback loops, strategy and dexterity, uncertainty and luck, physics-based control and animation, game complexity, design patterns, accessibility and human perception, semiology of graphics, game difficulty and balance, sources of creativity, AI methods and procedural content generation (PCG), characteristics of games, and interaction design

(lecture in bold, homework and presentation in italics, subject to change)

#	Date	Topic(s)
1	1/10	**00 Introduction**
		Prototype 0 assigned (Unity first steps + exploration)
		BASICS
2	1/17	**01 Game Feel**
		Prototype 0 presented (optional), prototype 1 assigned
3	1/24	**02 Mechanics + Characteristics**
		Prototype 1 presented, prototype 2 assigned
4	1/31	**03 Input + Control**
		Prototype 2 presented, prototype 3 assigned
		ADVANCED
5	2/7	**04 Systems + Balance**
		Prototype 3 presented, prototype 4 assigned
6	2/14	**05 Discretization**
		Prototype 4 presented, Prototype 5 assigned
7	2/21	**06 Procedurality + Randomness**
		Prototype 5 presented, Prototype 6 assigned
		APPLIED
8	2/28	**07 Accessibility + Semiology**
		Prototype 6 presented, prototype 7 assigned
9	3/6	**08 Difficulty + Obfuscation**
		Prototype 7 presented, prototype 8 assigned
	3/13	Spring Recess
		PITCH + POLISH
10	3/20	**09 Pitching + Other**
		Prototype 8 presentation, prototype pitch assigned
11	3/27	**Prototype pitches***, voting, and team assignment*
12	4/3	*Team presentation 1, team presentation 2 assigned*
13	4/10	*Team presentation 2, team presentation 3 assigned*
14	4/17	*Team presentation 3, final presentation assigned*
14	4/24	**Final presentation**

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