CMPS 20 – Game Design Experience

Winter 2013

Arnav Jhala
TA: Not Decided yet

Graders: Eric Lipshutz and Andrew Duensing, Thomas Deeb
• Professor: **Arnav** Jhala ([jhala@cs.ucsc.edu](mailto:jhala@cs.ucsc.edu))
  – Office Hours: Tuesdays by appointment (can sign up online – tinyurl.com/meetarnav)
• Teaching Assistants: **Not assigned yet**
• Readers/Tutors: **Eric** Lipshutz(programming), **Andrew** Duensing (team project), **Thomas** Deeb (team project and programming).
Resources

• Website
  – [http://courses.soe.ucsc.edu/courses/cmps20/Winter13/01](http://courses.soe.ucsc.edu/courses/cmps20/Winter13/01)
  – Discussion forum:
    • Piazza (piazza.com)
  – Submissions and Grading:
    • Project: Gforge repository (gforge.soe.ucsc.edu)
    • Class assignments and grades
      – eCommons (ecommons.ucsc.edu)
Overview

Design fundamentals, Game Appreciation, Game Studies, History.

Programming, Language, Data Structures, Dev Environments, Debugging.

Teamwork, ideation through deployment, *finishing* project.

Engines, advanced rendering, efficiency, new interfaces

Mostly narrow, played for fun, as *consumer*

Broad, played for fun and for study, as *designer, producer, developer*
Course Objectives

• Learn basic principles of game programming using a set of libraries
  – Main game loop, display of 2D sprites and 3D objects
  – Content pipeline, Art Integration
  – Collision detection, scrolling game worlds, UI development, and Storage.
  – Audio

• Learn how technology and collaboration affects game design
  – Mechanics, distribution platforms, work distribution in team projects

• Learn basic principles of object-oriented design
  – Subdividing a project into classes
  – Software design patterns

• Develop increased proficiency in programming on web platforms
  – Javascript, coding focused assignments

• Learn techniques for working as a team
  – Quarter-long game project developed in 4 person team
Grades

• Homework: 30% (2 individual assignments)
  – Assignment 1: basic sprite rendering and familiarity with development tools (JSFiddle) – 10%
  – Assignment 2: simple individual game (advanced development tools–Aptana Studio, debugging, deployment, versioning system) – 20%

• Midterm exam: 20%

• Term project: 50%, broken down as follows
  – Team formation document: 5%
  – Game concept document: 5%
  – Technical design document: 5%
  – First playable prototype: 10%
  – Public playtesting beta version: 10%
  – Final game project: 15%
• Textbooks (Not Required)
  – List will be provided in the Resources section of the website
  – Library has access to good ebooks

• Reference Materials
  – Articles that are uploaded on class website
  – Links to development forums, tutorials, etc.
  – Collaborative learning: please share interesting things you find on the Piazza forum
• Work in teams of 4 to create a fully playable computer game
  – Developed with web programming tools
  – Use of external libraries and art content (meshes, textures, etc.) that is freely available online (we will provide one called *brine*.)
  – Mentors will be assigned to each team in the second week
• Final Deliverables
  – Working game link and code
  – Manual
  – Wiki page that contains:
    • Design document
    • Screenshots
    • Videos
    • Development logs (daily logs for each team member)
    • Link to subversion code repository on GForge (UCSC)
• Phases
  – Team Formation (including Mentor Assignment) – Week 2
  – Game Concept Document – Week 3
  – Production Schedule Document – Week 4
  – Technical Design Document (including prototypes)
    – Week 6
  – Playable Prototype – Week 7
  – Public Playtest beta – Week 9
  – Final Game – Week 10
Your game design for this class **must** be based on one of the following themes.

- If it doesn’t then we will ask you to resubmit your design document with modifications.

**Themes**

- Persuasive game
- Based on a Poem (extra credit)
- Biographical game
- Game for a 4 year old child

(I have a playtester at home... psst. 4 year olds love dinosaurs.)
Persuasive Game Examples
Biography Game Example
Based on a Poem

SHE DWELT AMONG THE UNTRODDEN WAYS

SHE dwelt among the untrodden ways
Beside the springs of Dove,
A Maid whom there were none to praise
And very few to love:

A violet by a mossy stone
Half hidden from the eye!
--Fair as a star, when only one
Is shining in the sky.

She lived unknown, and few could know
When Lucy ceased to be;

But she is in her grave, and, oh,
The difference to me!

(William Wordsworth 1799)
Ages 4-6
Three aspects of this class

Design
- Mechanics
- Dynamics
- Aesthetics

Development
- Platforms
- Algorithms
- Art Integration

User Experience
- Polished product
- Rigorous testing
- Audience Experience

Target Theme
Collaboration
Portfolio Building
Design

• MDA Framework
• Brainstorming
• Writing a design document
• Understanding technology limitations
• Design under constraints

Source: WIRED mag
Game Development

- Programming
- Software Development
- Game Development
User Experience
This week: Your tasks

• Start forming teams (use Piazza)
• **Play games** that are shown in class and look for other games based on class themes (also post games you find on Piazza)
• Read following articles
  – [R1] MDA Framework article
  – [R2] How to write a design document
  – [R3] WIRED magazine article on Design under Constraints
• Start brushing up JavaScript and play around with HTML5/CSS in JSFiddle
Game Programming

- Authoring environments, Level Editors, UI Frameworks, etc.
- Game code & content
- Core engine libraries
- Virtual machines, Common Language Runtime (CLR)
- Operating System APIs, DirectX, OpenGL

You provide  
Provided for you
Variety of Tools

- Native (C, C++)
- OpenGL, DirectX
- OpenSceneGraph, Blender
- Unreal, Source, Unity3D
- C#/XNA
- ActionScript
- Processing/Java
- HTML5/CSS/WebGL/JavaScript
- Gamemaker, Gamesalad
- Alice, Touchstudio, Scratch
History

- Browser wars
- *Layout engines*
- Client-side scripting
- Usage patterns
- Standardization
- Native support
Basic Game Loop

Base Game Class

# Initialize()
# Run()
# Tick()

Update(gameTime);
Draw(gameTime);

myGame

- graphics: GraphicsContext
- content: ContentManager

+ myGame()
  # Initialize()
  # LoadContent(loadAllContent: bool)
  # UnloadContent(unloadAllContent: bool)
  # Update(gameTime: GameTime)
  # Draw(gameTime: GameTime)

base.Initialize()

graphics = new GraphicsDeviceManager(this);
Content.RootDirectory = "Content";

Example

- Programming workflow
- Basic language constructs
- Drawing
- Updates
- Interaction

- Snake on CodePlayer
Upcoming classes and assignments

• Discuss design
• Start quick introduction to Javascript/HTML5/CSS and development tools
• Labs next week
  – In the Mac section (NOT PC)
  – Face the Name game in
• Individual assignment
  – Development environment setup and drawing sprites
  – Alchemy game
  – http://littlealchemy.com
• Team assignment
  – Team formation document
Before we jump in...