CMPS 20: Game Design Experience

Course Overview

Arnav Jhala
Game Design Program: Classes

• 80K – Game Design Fundamentals: Covers history and design of games; could become a major requirement; very useful and highly recommended

• 17X – Year-long studio sequence; large teams; work nearly full time on an innovative game; variety of platforms
Administrivia

• CMPS 20
• Professor: Arnav Jhala (jhala@cs.ucsc.edu)
  – Office Hours: Tuesdays and by appointment
• Teaching Assistants: Sherol Chen, Varun Raghavan
• Readers/Tutors: Devon Wyland, Ryan Andonian, Vivian Wong
Class Information

- Website
  www.soe.ucsc.edu/classes/cmps020/Winter11
  moodle.soe.ucsc.edu
- Schedule (Lecture slides, notes, due dates)
- Homework and Project Information
  – Description and Evaluation Criteria
- Resources (Links to articles, tutorials, examples, etc.)
- Twitter: ucsc_cmps20

- Keep up with class
Course Intro: Objectives

• Learn basic principles of game programming
  – Main game loop, display of 2D sprites and 3D objects
  – Content pipeline, Art Integration
  – Collision detection, scrolling game worlds, shaders
  – Audio
• Learn basic game AI techniques
  – Simple behaviors
• Learn basic principles of object-oriented design
  – Subdividing a project into classes
  – Unified Modeling Language structure diagrams
  – Software design patterns
• Develop increased proficiency in programming
  – C# language, coding focused assignments
• Learn techniques for working as a team
  – Quarter-long game project developed in 4 person team
Grades

• Homework: 30% (3 assignments, each worth 10%)
• Midterm exam: 15%
• Final exam: 15%
• Term project: 40%, broken down as follows
  – (Percentages are of final course grade, and sum to 40%)
  – Team selection: 1%
  – Game concept document: 5%
  – Work breakdown and schedule: 3%
  – Technical design document: 7%
  – Partially operational game prototype: 3%
  – Updated schedule: 1%
  – Final game project: 15%
Reading Material

• Textbooks
  – Learning XNA 3.0 by Aaron Reed, O’Reilly publishers, 2008
  – Programming C# 4.0 by Jesse Liberty and Donald Xie, O’Reilly publishers, 2007
  – Available at campus bookstore and online

• Reference Materials
  – Articles that are uploaded on class website
  – Links to XNA and C# development forums, tutorials, etc.
Project

• Work in teams of 4 to create a fully playable computer game
  – Developed on XNA platform in C# (covered in class)
  – XNA provides libraries and art content (meshes, textures, etc.) is freely available online
  – Created games can run on Xbox 360, PC, and Zune
  – Examples

• Phases
  – Team Formation – Week 2
  – Game Concept Document – Week 4
  – Production Schedule Document – Week 5
  – Technical Design Document (including prototypes) – Week 7
  – Playable Game Milestone 1 – Week 8
  – Playable Game Milestone 2 – Week 9
  – Final Game – Week 10
XNA Game Examples

• Some of these were made in 48 hours over a weekend by groups of 3 to 4 programmers
• Student games
• Research projects
XNA Game Studio Express

- XNA GSE is a series of libraries for creating 2D and 3D computer games
  - Uses C# as the primary programming language
  - Integrated with Visual Studio C# Express
    - Also now the full version of Visual Studio
  - Games can run under Windows or on Xbox 360
  - It is possible to create professional games using this toolkit
- Example games:
XNA Game Studio Architecture

- You write your game in C#
  - Using features in XNA Framework
- Runs on top of common language runtime ("Managed Code")

1. Game code (C#) & content
2. XNA Framework
3. Common Language Runtime (CLR)
4. Windows APIs, DirectX

You provide

Provided for you
XNA Features

• 2D & 3D graphics support
  – Access to HLSL (High level shader language)
    • Pixel and vertex shaders
• Audio support
  – XACT cross-platform audio tool
• Controller and keyboard input
  – Xbox 360 controller
• Font support
• Content Pipeline
• Game save storage
• Networking
• ... and much more
Installing XNA Game Studio Express

• Follow instructions on pages linked from:
  – Microsoft DreamSpark ([https://www.dreamspark.com](https://www.dreamspark.com))
  – Also found on Tools page of course website

• Install Visual Studio
  – Visual Studio is an integrated development environment (editor/debugger/compiler)
  – Unless you currently use Visual Studio, you want “Visual C# 2008 Express”
    • XNA GSE will work with Visual Studio 2008 Professional if you have that installed instead

• Install XNA Game Studio 4.0
  – **You want version 4.0**, the latest version
  – The textbook covers 3.0
  – Version 4.0 differences will be pointed out
XNA Creator’s Club

- XNA Creator’s Club Website
  - http://creators.xna.com/
  - Community website for XNA GSE
  - Multiple complete games with source code
  - Many tutorials, and code examples
  - Very active discussion forums

- Creator’s Club Subscriptions
  - Can put game on Xbox 360
  - Access to premium content

- Trial membership - free
  - Available through Dream Spark or MSDNAA
    - Allows you to put game on Xbox 360
XNA Community Web Sites

• XNA Team Blog
  – blogs.msdn.com/xna/
  – Announcements from the XNA dev. Team

• Ziggyware
  – www.ziggyware.com
  – Developer-oriented XNA news
  – Recent contest for XNA tutorial articles
    • Winner: Skeel Keng-Siang Lee’s Introduction To Soft Body Physics

• XNA Development
  – www.xnadevelopment.com
  – XNA tutorials. See also the Links page for links to other quality XNA websites
Controllers

• XNA Game Studio Express allows you to use Xbox 360 controllers
  – Normal Xbox 360 controller is Bluetooth wireless, and is **not recognized** by the Windows Bluetooth manager
  – Hence, when developing game under Windows, won’t be able to test control scheme (bad)

• To create a game using Xbox 360 controller, need to:
  – Buy a corded Windows Xbox 360 controller (~$35 + shipping)
    • Google for “xbox 360 controller windows” for multiple online vendors
  – OR, buy an Xbox 360 wireless gaming receiver (~$20 + shipping)
    • allows wireless controller to work with Windows
  – Should buy now, so you have it ready for when you start programming

• Can also create a game that uses keyboard input
  – Would need to change control scheme to port to Xbox 360
Demonstration of Visual C# Express & XNA

• *Demonstration of loading, compiling, and running one of the sample games for XNA Game Studio Express*
Homework

• Visit Creators Club and DreamSpark websites
• Download and install
  – Visual Studio C# 2010
  – XNA Game Studio
• Compile and run a sample game
• Play around with starter kits

• Read Chapter 1 (Getting Started) in XNA 3.0
• Read in Programming C# 3.0
  – Chapter 1 (C# 4.0)
  – Chapter 2 (Getting Started: "Hello World")
  – Chapter 3 (C# Language Fundamentals)
• Try one of the example code samples from the book for yourself in Visual C# 2010
  – Get familiar with Visual studio environment
• Book is available online, via O’Reilly Safari
  – http://proquest.safaribooksonline.com/9780596527433
  – Use on-campus computer to access