An Introduction to Game Design and Development

- Spring Semester 2017
- Dr Nick Hayward

A brief outline of an introductory course to *Game Design and Development*.

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Course Prerequisites

This course requires the following minimum prerequisites for registration in Spring semester 2017,

- COMP 271 - Data Structures

Intro

This semester long course will offer CS department students a practical introduction to *Game Design and Development*. Underlying concepts will be introduced and demonstrated throughout the course with a particular focus on working examples and *playtesting*.

Students will gain practical experience of design and development, which is applied as part of the project-based assessment for the course.

Throughout the course, students will also be exposed to the many and various types of games and gaming environments now available across multiple genres.

As such, this course will offer a combination of technical concepts and development, awareness of aesthetic requirements, and cultural perspectives inherently necessary to create well-rounded, performant games and gaming environments.

Part 1

We begin with an overview and appreciation of fundamental concepts that unify how games work. This will include, for example, gaming theory related to rules, objectives, and procedures.

As such, a student should be able to clearly define the underlying nature of a *game*, and, therefore, what makes a game compelling for players.

The first part of the course will begin with an appreciation of game design fundamentals.

For example,

- the underlying structure and role of games
  - what makes a game? i.e. a whole from the sum of its parts
  - various gaming definitions
- the fundamental types of games initially considered relative to gaming theory, e.g.

    - cooperative and non-cooperative
    - simultaneous and sequential move games
    - symmetry and asymmetry in games
    - ...
- analysis of gaming frameworks, e.g.
    - mechanics, dynamics, and aesthetics (better known as MDA)
- a consideration of formal gaming elements
    - player roles and engagement
    - gaming objectives, rules, and procedures
    - conflicts, resolution, and potential boundaries
- crafting stories and concepts

Part 2

As we transition to designing more formal games and gaming environments, we may now start to consider the following requirements for game design.

- concepts and outlines
- general functionality and goals
- how to define and design *fun* elements within a game
    - i.e. factors and concepts that encourage play...
- prototypes
- methods, patterns, and stages of development
    - defining required stages for a game outline
    - development patterns suitable for game types
- *playtesting* games
    - its role in design and development
    - basic concepts and techniques
    - metrics and feedback
    - hands-on application and practice

Part 3

The third part of this course will offer practical guidance and examples for developing games. This will focus upon a series of practical games and gaming solutions, which will help provide a clear reference for game development and design.

This course will use Python as the primary programming language. This will be complementary to the *PyGame* modules, and game development using the Simple DirectMedia layer.

Students will learn to develop games and gaming environments using *PyGame*, and associated modules and technologies. This includes standard and advanced character and environment motion, interaction, and visualisation. Students will also see examples of working with 3D game development, and complementary options for 2D rendering and visualisation. This presents opportunities to develop not only different game genres and environments, but interesting combinations of 3D gaming levels and worlds with 2D visuals and user interface elements.

Assessment

The semester long project development will form a core requirement for the overall course assessment. This will be complemented by individual exercises and brief quizzes, as and when applicable.

Grade breakdown is as follows,

- Project design and development
  - part 1 = 30%
  - part 2 = 40%
- Additional
  - exercises = 15%
  - quizzes = 15%

Summary

This course has been designed and conceived as an intensive introduction to the world of game design and development. It should prepare the student for further specific study and work in their chosen gaming domain of interest.

Whilst the course has been artificially divided into three distinct parts, as noted above, they will fit together throughout the semester to offer a unified course. Abstracted concepts noted and considered will be referenced to working examples and development opportunities.