

T311: Multiplayer Game Design

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Telecommunications New Media Curriculum

Abstract

Multiplayer gaming is changing our society, and creating a new mode of interpersonal communication. This course examines the technology behind the revolution, with a primer on networking. Students will learn the fundamentals of exchanging data over the Internet, and will complete assignments leading them to the creation of several multiplayer networked games using Java and Flash MX.

Required Texts

Jobe Makar *Macromedia Flash MX Demystified* (Macromedia Press 2003)

Tom Petchel - *Java 2 Game Programming* (Premier Press 2002)

Tim K. Chung et. al - *Macromedia Flash MX Creating Dynamic Applications Integrated Technologies: Macromedia Flash, Java, ColdFusion and .NET* (Macromedia Press 2003)

Weekly Syllabus & Assignments

A. Multiplayer Game Design using Flash

Week 1 - Terminology. Game Genres. Introduction to Flash.

- Game views. General terms. Flash strengths and limitations. Flash vs. non-Flash games. Why use Flash?
- The game design document: from idea to design. High concept. Gameplay. Features. Target market. Target hardware platform. Estimated schedule and budget. Competitive analysis.
- Case studies: Word Search, Ice World, IceBlox, Pinball, Tic-Tac-Toe, 9-Ball (a game of Billiards) and Don't Fall!

Week 2 - The Nuts and Bolts.

- Trigonometry. Basic physics: speed, velocity, acceleration; Newton's three laws of motion; gravity; friction. Collision detection and collision reactions.
- Short programs illustrating the concepts are assigned as lab work.

Week 3 - Tile-Based Worlds

- Introduction to tiles. Precision detection. Adding a character to the world. Externalizing the world data (using XML).
Case study: Pac-Man.

Week 4 - The Isometric Worldview

- Introduction to isometrics. Z-sorting. Elements of a simple world.
- Case study: Ziggy and Karel the Robot.

Week 5 - Graphics in Games.

- Types of graphics
- Stages of graphics development.
- Game animations

Week 6 - The Sound of Games

- Why sound is important.
- Managing sound effects. Sound controlled with ActionScript.
Creating sound effects. Editing and preparing audio loops.

Week 7 - Networking. Dissecting a Chat

- Multiuser servers. What is a socket server? Internet basics. IP address. Ports. Sockets. Where does Flash fit in? Socket servers. Introducing the ElectroServer API.
- Introduction to the chat. Hands-on tour of the chat. The file structure. The ActionScript.
- A tour of multiuser dynamic applications that we will be implementing with Flash: Dynamic Polling System, Guest Book with a Whiteboard, Message Board System, Avatar Chat, Sea Commander, Instant Messenger, Videophone Application.

Week 8 - Midterm Exam

- Choose between IceWorld and Pinball and implement a game from start to finish.

Week 9 - Multiplayer Games

- Tic-Tac-Toe: your first multiplayer game.
- 9-Ball: a far more realistic multiplayer game of billiards.

Week 10 - Don't Fall!

- Analysis of a very simple but original isometric, tile-based, turn-based, multiplayer game.

B. Multiplayer Game Design using Java

Week 11 - Why use Java?

- Basic Java. Applet basics. Event handling.

Week 12 - Graphics and Animation

- Rendering Shapes, Text and Images
- 2-D Animation Techniques

Week 13 - Building a Game Engine

- Designing an Actor2D class.
- Scene Management
- Custom Visual Controls and Menus
- Basic Networking Support.

Week 14 - Advanced Applications

- Basic networking revisited.
- Client-server architectures.
- Java, XML-RPC, and Flash MX.

Final Week - Projects Due