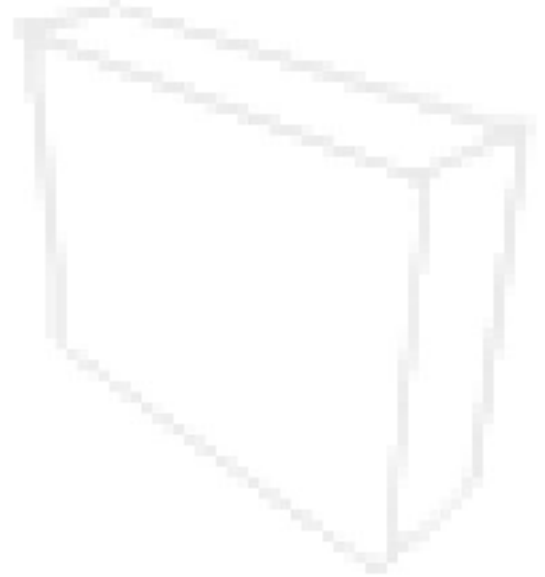

Dimension 3D Window Manager

Inter-professional Project 306

Spring 2001 Team

Overview

- What is a Window Manager?
- Open Source / GPL
- OpenGL / Xlib
- History
- Milestones for Spring 2001
- Phases of Development
- Successes



What is a Window Manager?

- Functionality
 - Mapping Windows
 - Handling Events
 - Keyboard Events (e.g. typing, F1, F2, ...)
 - Mouse Events (e.g. double-clicks, dragging, ...)
 - Menu Systems
- Examples of Xfree86 Window Managers
 - Sawfish/Sawmill
 - Enlightenment
 - Window Maker
 - FVWM



Open Source Software Development

- Basic Principles
 - More eyes = Fewer defects
- GNU General Public License
 - What is it?
 - Provides for use and modification of other GPL source code
 - Guarantees that the program remains freely available and able to be redistributed
 - How can this help with our software development?
 - GNU Linux - Free operating system
 - GNU standard tools
 - GCC (GNU Compiler Collection)
 - Make
 - Lex/Yacc
 - Xfree86 – Free Xwindows Server
 - Access to Xlib and OpenGL



OpenGL and Xlib

- OpenGL – Open Graphics Library
 - Graphics API for advanced 2D/3D environments
 - Developed by Silicon Graphics, Inc.
 - Open Source Mesa3D Implementation
- Xlib – The X Library
 - Provides necessary functionality for basic window management services
 - Managing the keyboard and mouse
 - Opening, closing, and adjusting windows



History

- Project started in Fall 1998
 - Initial Strategies
 - Proof of concept 3D window manager
- Major revisions start in Spring 2000
 - Major goals for this version
 - Stable
 - Clean
 - Relatively Fast
 - Well documented code base

Milestones for Spring 2001

- Continued Code Stability
- Improved Translation and Rotation
- Texture Library
- Actual mapping of real windows
- Implementation of Menus
- Hit Scanning and Selection
- User-customizable controls
- Skybox environment

Phases of Development

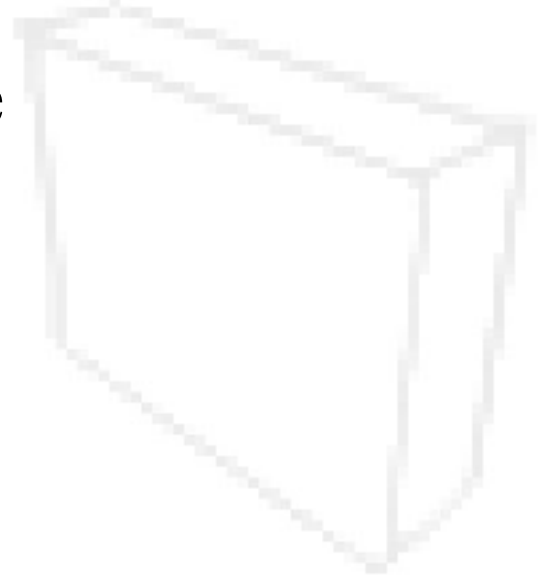
- Familiarization with Code (1 week)
- New Feature Design (2 weeks)
- Implementation and Testing of the New Features (5 weeks)
- Debugging (4 weeks)

Movement in Dimension

- More efficient translation
- Fully featured rotation
- Bounded the 3D environment
- Keyboard and mouse movement
 - Quake-style movement with Numeric keypad
 - Controls for changing between rotation and translation

Texture Library

- More efficient memory usage
 - Texture memory management
 - Reference counting scheme
- Hides OpenGL specific calls
- Handles file translation
- Central repository

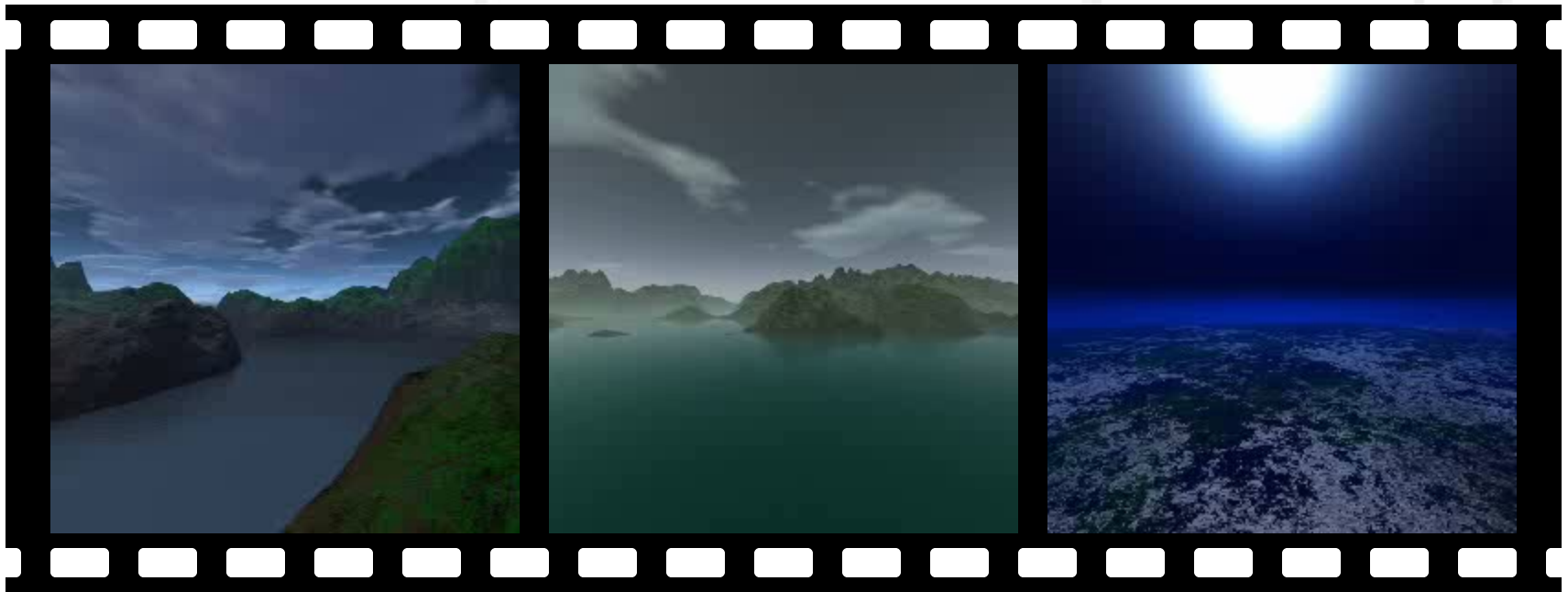


Hit Scanning and Selection

- Selection in OpenGL
- Hit Scanning with vectors
- Selection speeds up Hit Scanning
- Handles mouse clicks
 - Hit Scanning: 3D space vs. Window Space
 - Selection: Moving Objects

Skybox Environment

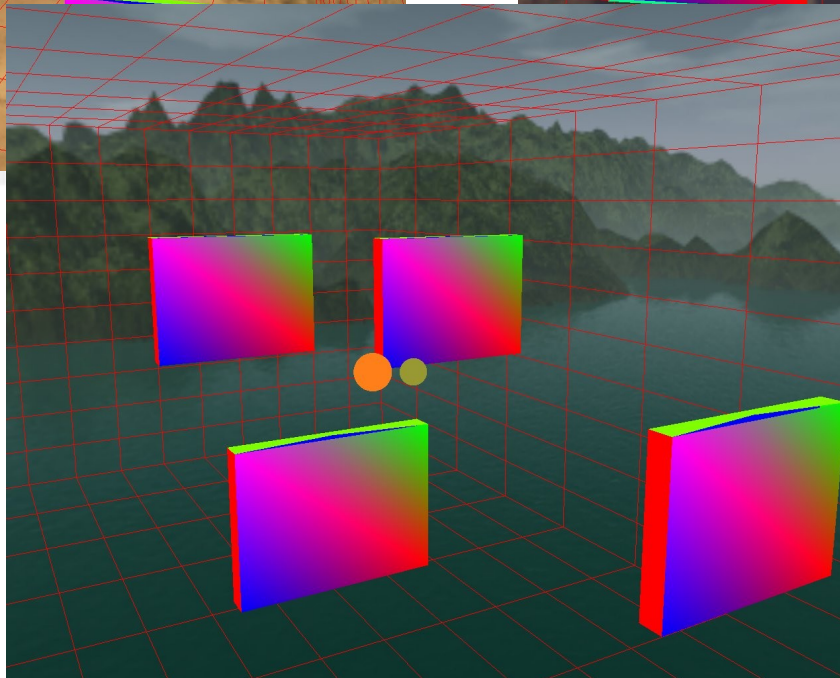
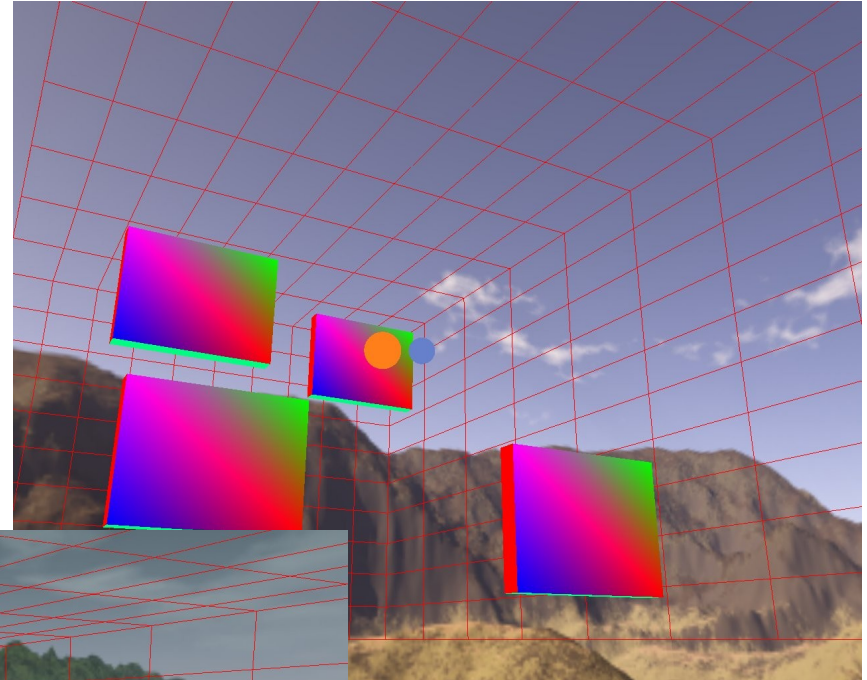
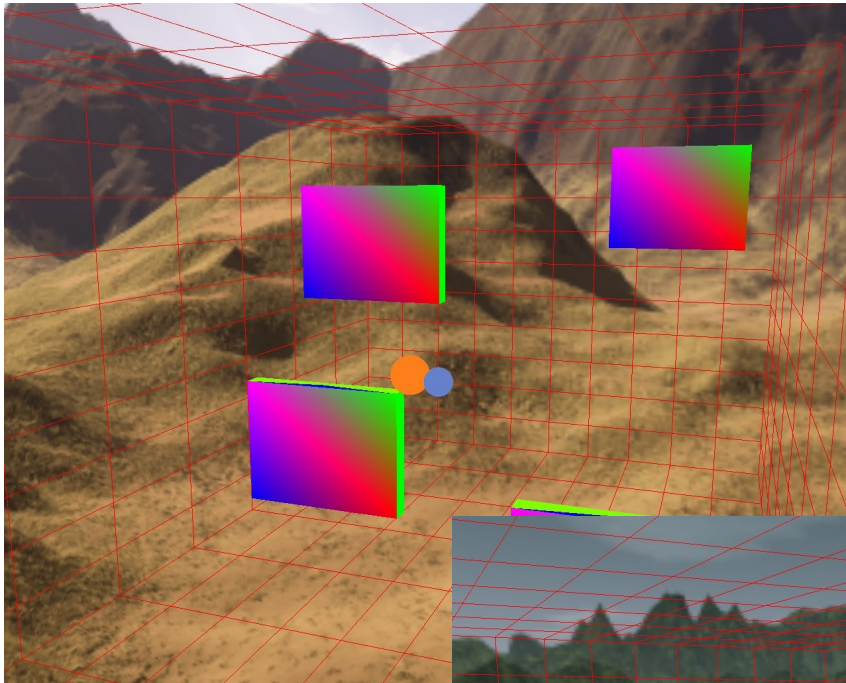
- 3D environment
- Centered on camera



Configuration Files

- Implemented with Lex/Yacc
- Grammar is easily extendable for future work
- Provides needed flexibility for configuration of the window manager
- Current user-configurable options include:
 - Keyboard commands:
 - 3d motion on/off
 - Rotation on/off
 - Generate a new window
 - Shutdown the window manager
 - Skybox Theme Support
 - Loading a new theme

Screenshots



Future

