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Prometheus Simulator

An ant colony AI Simulation

Design Project 1

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Team Members

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Design Project 1

- Abstract
  - Introduction
  - Background
  - Goals and Objectives
  - Design Problems
  - Future Plans
  - Impact on Society and the Environment
  - Demo Results
  - Questions and Answers

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Introduction

- What is the Prometheus Simulator?
  - AI
  - Physical model engine
  - Graphical engine
  - Capable of running on multiple platforms

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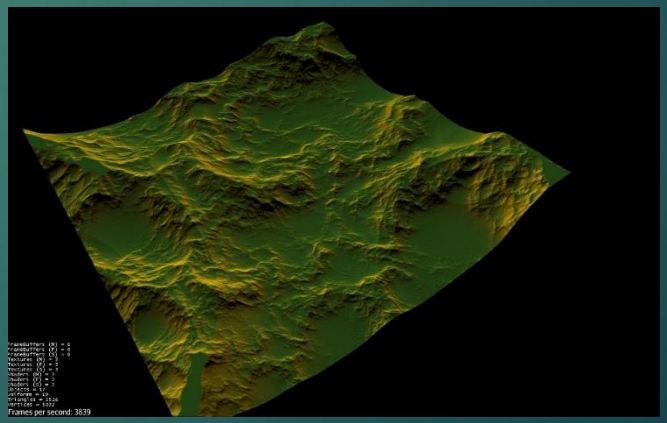
Introduction

- AI Design

- The Environment Loader



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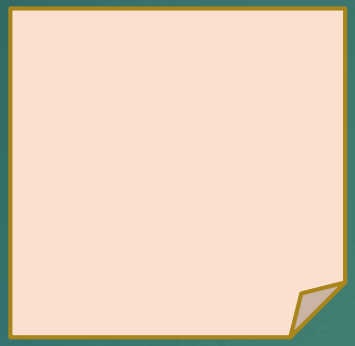
Background

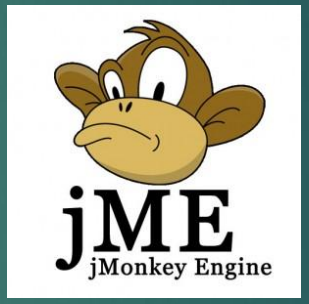
- Previous Generation



- Current Generation

Background

- **jMonkeyEngine (JME)**
  - Open Source
  - Cross Platform
  - Easy to use
- **Java**
  - Open Source
  - Cross Platform
  - High Level Interaction
- **XML**
  - Data
  - Cross Platform
  - Easy to automate



Goals & Objectives

- Run Simulator
- Identify Problems
- Provide Future Solutions

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Requirements (GUI)

- World Map
- Objects & Terrain types representation
- Mini-map

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Graphical Interface

Functionality

- Load/Save

Simulation

- Start, Pause, Restart, Advance to, Add AI
- Modify Parameters Dynamically

Visuals

- Show Layers

Design

- Map Editor
- Addition of new terrain types
- Addition of movable obstacles
- New characteristics
- Improve smell engine
- Documentation & API

Design (Map Editor)

- Generate Random Mazes
- Resource Browser
- Export world maps to simulator
- Import of world maps
- Dynamically add new resources

Future Plans (Timeline)

- Map editor
- GUI Improvements
- Smell Engine Improvements
- Testing
- Documentation
- Refactoring when possible

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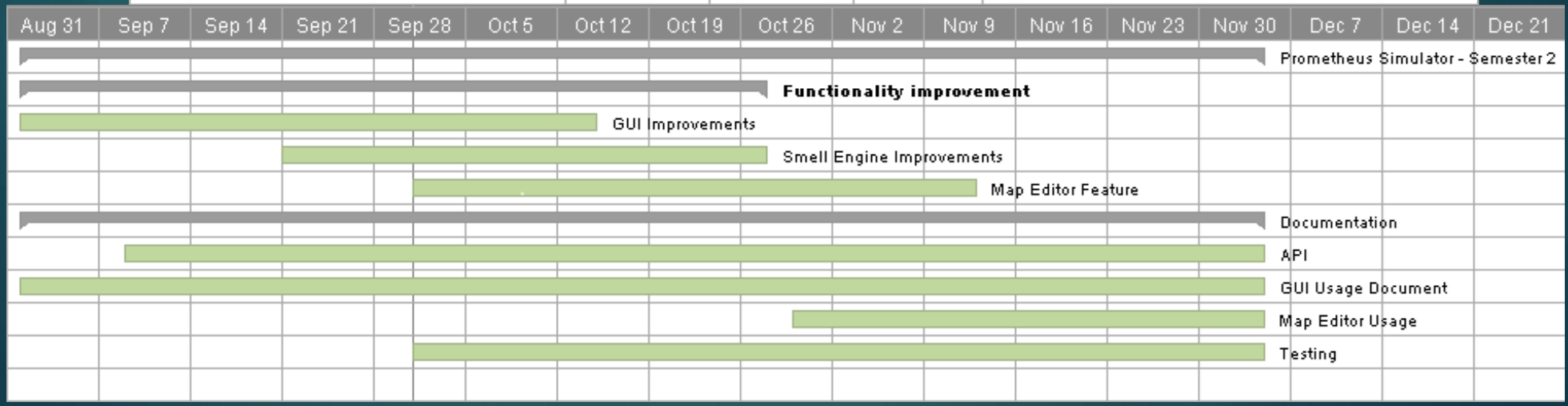
Gantt Chart Timeline

Task Name	Start Date	End Date	Duration	Assigned To
Prometheus Simulator - Semester 2	09/01/15	12/04/15	69	
Functionality improvement	09/01/15	10/27/15	41	
GUI Improvements	09/01/15	10/14/15	32	Muhammad
Smell Engine Improvements	09/21/15	10/27/15	27	Muhhamad
Map Editor Feature	10/01/15	11/12/15	31	Muhammad and Roman
Documentation	**09/01/15**	**12/04/15**	69	
API	09/09/15	12/04/15	63	Harry
GUI Usage Document	09/01/15	**12/04/15**	69	Roman
Map Editor Usage	10/30/15	12/04/15	**26**	Harry
Testing	10/01/15	12/04/15	47	Team Effort



Impact on Society

- Can be extended for further applications to improve quality of life
  - Model behavior of gases (Smell distribution)
  - Model behavior of airborne particles (Disease)
  - Observe human behavior

Impact on Society

- Benefits for businesses
  - Reduce cost by providing virtual world to test their implementations
  - Conduct test in virtual world before in real physical world (Control baseline for experiment)

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Impact on Environment

- Allows users to see how environment is affected by airborne stimulus
  - Observe how the animals interact with each other with stimulus
  - Smell and wind engine can be extended to model stimulus carried by liquid (water)

Impact on Environment

- Allows users to predict impact on environment
  - Make better informed decisions concerning the environment

Demonstration

- Demonstrating the Simulation in real-time now
- Thank you for your patience

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Conclusion

- Final Words
- Questions?