

COMET: The Base Work

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Introduction

(Intro from actual comet paper). The goal of the COMET project is to create a fire emergency simulation to better train on-scene managers. The simulation will be designed to give the on-scene commander the feeling of being in a real emergency by providing agents that will act as the fire fighters of their own department and by providing an interface that immerses them in the virtual environment. The work shown here provides a foundation for further work on the COMET project.

Background

Some related work is described below.

- DEFACTO
 - Agent communication
 - Agents learn from low-level activities
- BreakAway's Incident Commander
 - On-scene commander game
 - Top-down
 - More like game than real emergency situation
- SimOps Studio's Fireslayer Challenge Thermal Response
 - Fire Fighter Simulator
 - Player searches using MSA Evolution 5200 Thermal Imager

Research

- 3D Modeling
 - Creating 3D objects in Maya
- Particle Systems
 - Generating Fire
 - Generating Smoke
- Player Interface
 - Viewing and moving in a virtual environment
 - Wii Remote Interaction
 - Head Tracking
 - Speech Recognition

Impact

- 3D Models
 - Fire Truck (Figure 1)
 - Fire Hydrant (Figure 2)



Figure 1:
Fire Truck Model



Figure 2:
Fire Hydrant

- **Particle Systems**
 - **Burning Fire**
 - **Rising Smoke (Figure 3 contains both)**



Figure 3:
Smoke and Fire Particle System

- **Player Interface**
 - **Movement**
 - **Controllable Viewing**
 - **Wii Remote Use: Selection and Movement**
 - **Status Display (Figure 4)**
 - **Interaction between Selection and Objects in Environment**

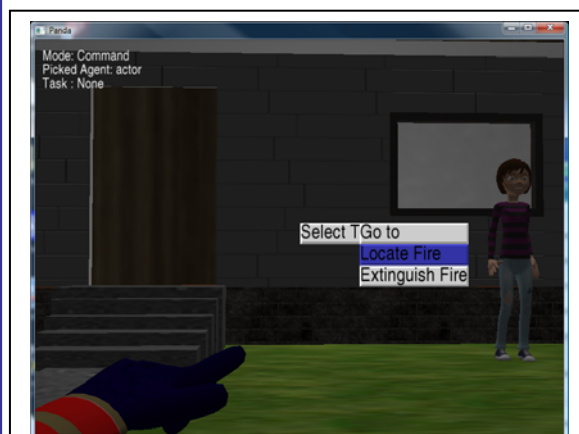


Figure 4:
Screenshot of Player Interface
(Status Display text shown
in upper left corner)

Conclusions

What I learned from my research experience:

- Key components of video games:
 - Game Engine
 - Environment Development
 - Interactions between Player and Virtual World
- Research habits:
 - Keep journal and blog
 - Be ready to demonstrate work at all times
- Research can be frustrating and fun at the same time

Future Work

If time allowed for further work on this project, head tracking and speech recognition capabilities would be added to the player interface in order to make the simulation more realistic.

Work will continue on this project; the agents and motion capture will be utilized to accomplish the goals of the COMET project.