

Object Oriented Multi- Agent Simulation

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NASA 2003 Summer Intern

USMA, Class of 2004



Purpose

- To provide an overview of my experience at NASA, and describe the application of skills gained from learning and working with professional engineers in the civilian environment.





Outline



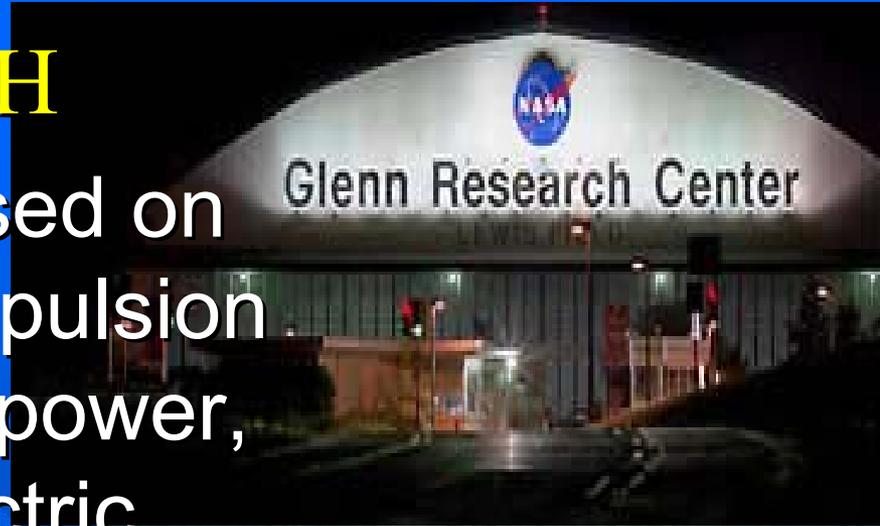
- Background on NASA GRC
- Organizational Structure
- Problem Statement
- What is Object Oriented Multi-Agent Simulation
- Vega Prime – Multigen Paradigm Software
- Results
- Conclusions
- AAR Comments



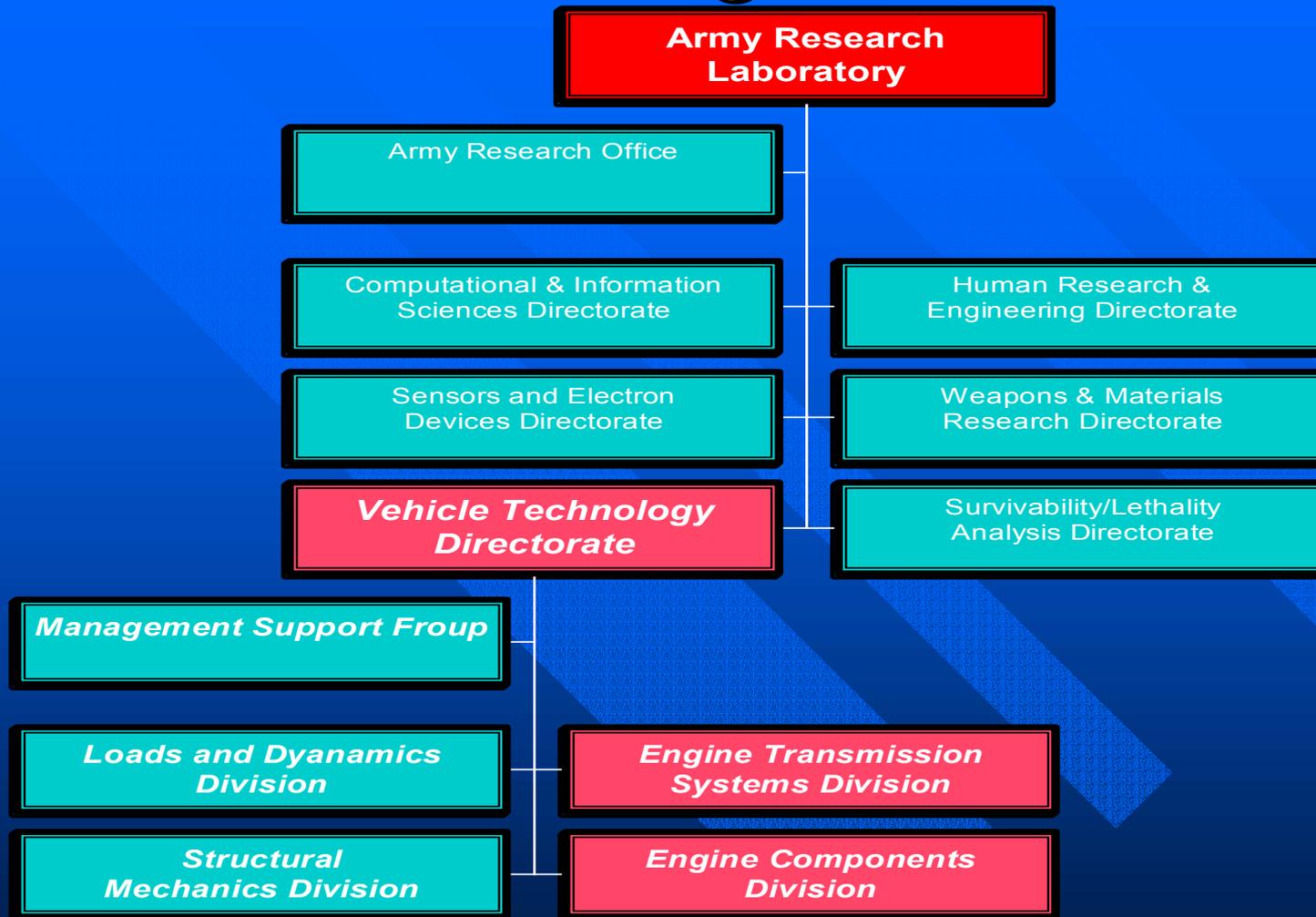
NASA Glenn Research Center

Cleveland, OH

- Since 1941, work is focused on research for new aeropropulsion technologies, aerospace power, microgravity science, electric propulsion, and communications technologies for aeronautics, space, and aerospace applications.



ARL Organization



NASA GRC

Problem Statement

Make an assessment of the compatibility of the Vega Prime Simulation software program for the PC with NASA SGI Flight simulator and analyze the difficulty level of programming and time commitment needed to accomplish transferring to new software.

What is Object Oriented Multi-Agent Simulation

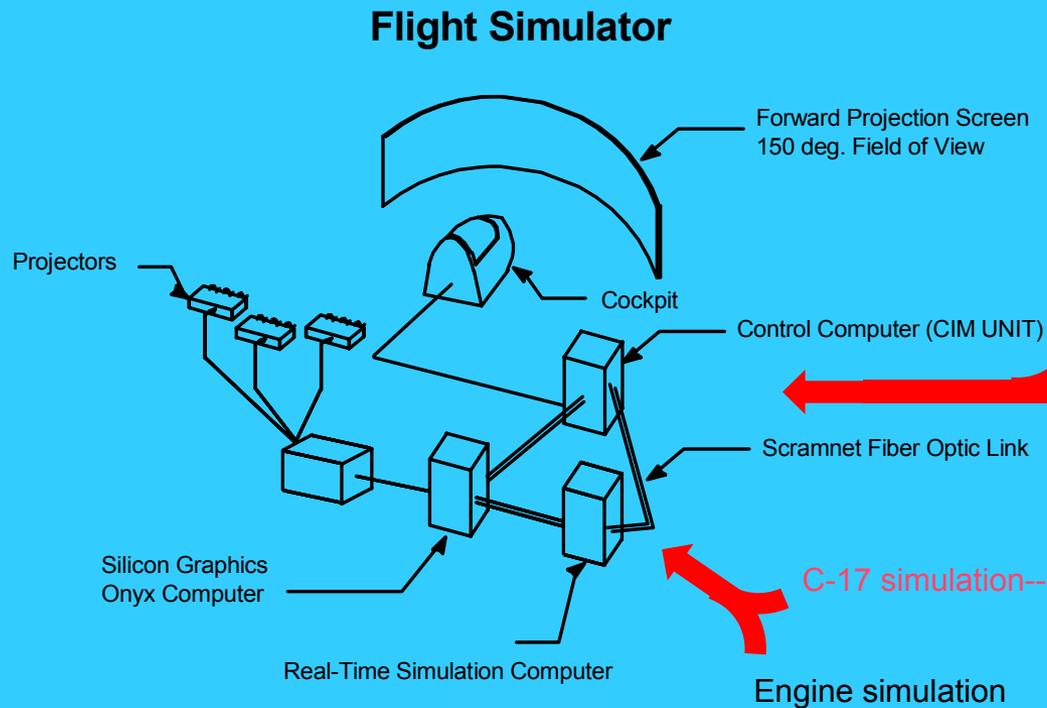
- Real time Video Programming for simulation from an objects 3 dimensional perspective, using detailed realistic controls and different visual modes.



Integration Plan

NASA GRC PILOTED EVALUATION STATION (FLIGHT SIMULATOR)

Demonstrate autonomous propulsion system technology in a real-time simulation environment



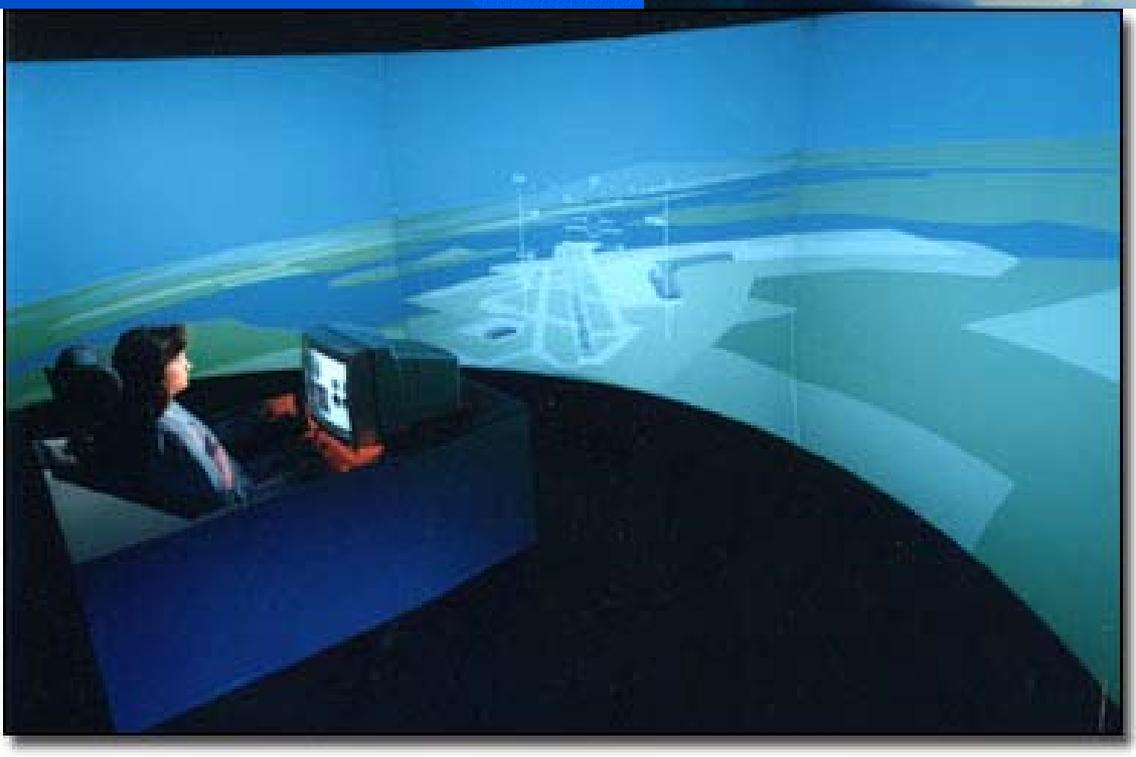
High-Level Decision Making
Engine/Vehicle interface

Diagnostics, Adaptive and
Reconfigurable Control

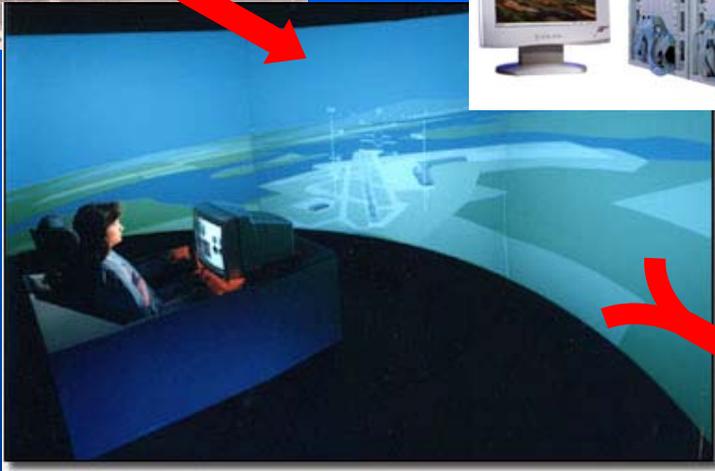
C-17 simulation--DFRC

Engine simulation

Old Look



Transition and Integrate



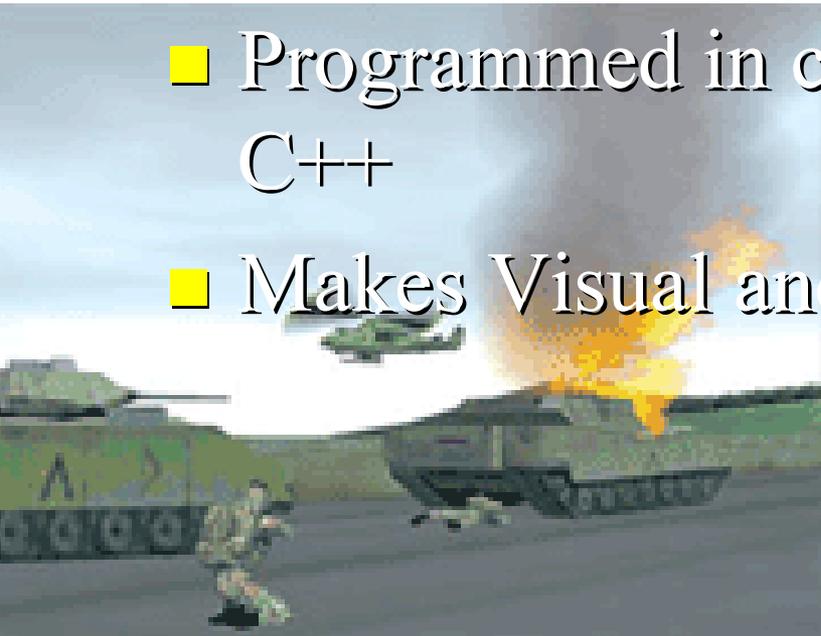
New Look



Vega Prime

- Real time 3 dimensional simulation from multiple perspectives, using the most advanced software on a PC
- Newer version of Vega

- Programmed in company specific version of C++
- Makes Visual and Urban simulations



Results

- Evaluated Vega Prime –Multigen Paradigm
- Developed new simulation with graphics from flight simulator
- The program file types were not compatible
 - Acf – application configuration file
 - Cdf – channel definition file
- Programming language was different
- Technical Support Engineers did not have a converter for file types or simulations
- SGI needed more memory specs to run

Conclusions

- Purchased Vega Prime Software
- Replace old SGI computer and ordered new PC's to run new simulation
- To much time trying to transfer old simulation.
- Multigen-Paradigm updated technical support website

AAR Comments

- If I had more time, could have done more
- Wish took more programming classes
- Spent too much time getting set-up
- Trip to ARL Adelphia, MD took some time, very informative, good experience
- Living Accomadations great
- Gained experience, and real application
- NASA Faculty was Excellent!!

Questions ?



Sources

- <http://www.grc.nasa.gov/>
- <http://www.nasa.gov/externalflash/NASA45th/loadmovie.html>
- <http://www.multigen.com/news/gallery/index.shtml>
- <http://www.arl.army.mil/main/Organization/default.cfm?Action=ARLOrganization&header=YES>