

# *Creating Opportunities for Computer Game R&D Projects*

Walt Scacchi and friends

Institute for Virtual Environments and Computer Games  
and

Institute for Software Research  
University of California, Irvine

May 2013

# Motivation

## What are we doing?

- Empirical research and technology prototyping of computer games/virtual worlds (CGVWs) that support challenge problems in science, health care, art, technology and defense studies
- Serial research entrepreneurship

## Why are we doing this?

- Computer games are both *technology* and *new media*
  - An opportunity area for research and innovation in playful socio-technical systems
- Enable immersive and transformative experiences that facilitate learning through R&D, play and failure experiences
- Engage new students and emerging scholars

# Some game R&D projects of interest

- ◉ Science learning games for informal science education at Discovery Science Center
- ◉ Game-based semiconductor fabrication operations training simulator
- ◉ Virtual worlds for space science on a sphere
- ◉ Game-based decentralized command and control training simulator
- ◉ Experimental games for business, cultural critique, art and technology
- ◉ Facilitating local game development community
- ◉ New projects in progress:
  - ◉ World of Music, and Science Mission games



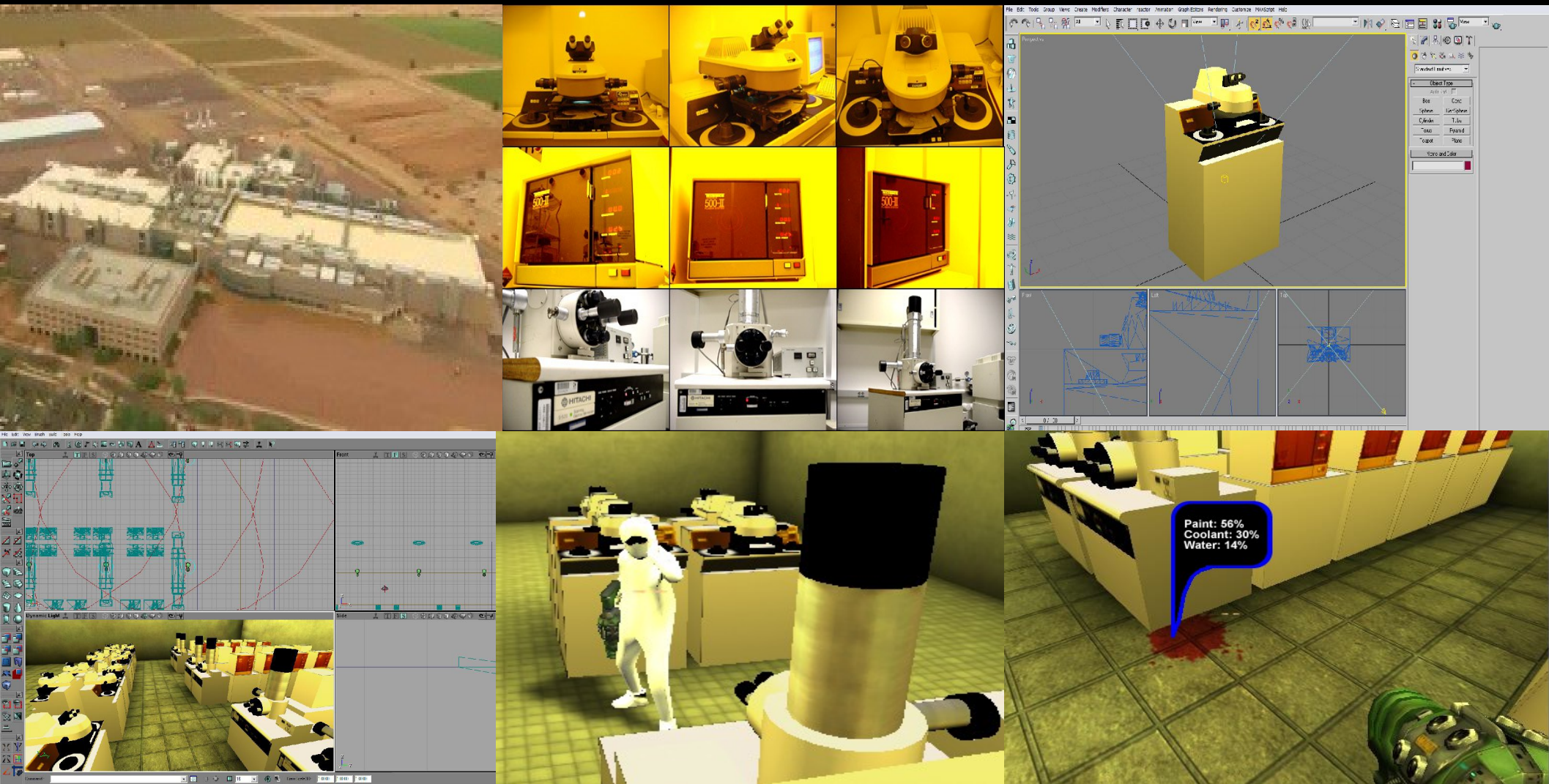
# Web-based science learning games for informal science education for K-6<sup>th</sup> grade students and families



Scacchi, W., Nideffer, R. and Adams, J. (2008), *A Collaborative Science Learning Game Environment for Informal Science Education: DinoQuest Online*, in *New Frontiers for Entertainment Computing*; P. Ciancarini, R. Nakatsu, M. Rauterberg, M. Roccetti (Eds.); Boston: Springer, 71–82.



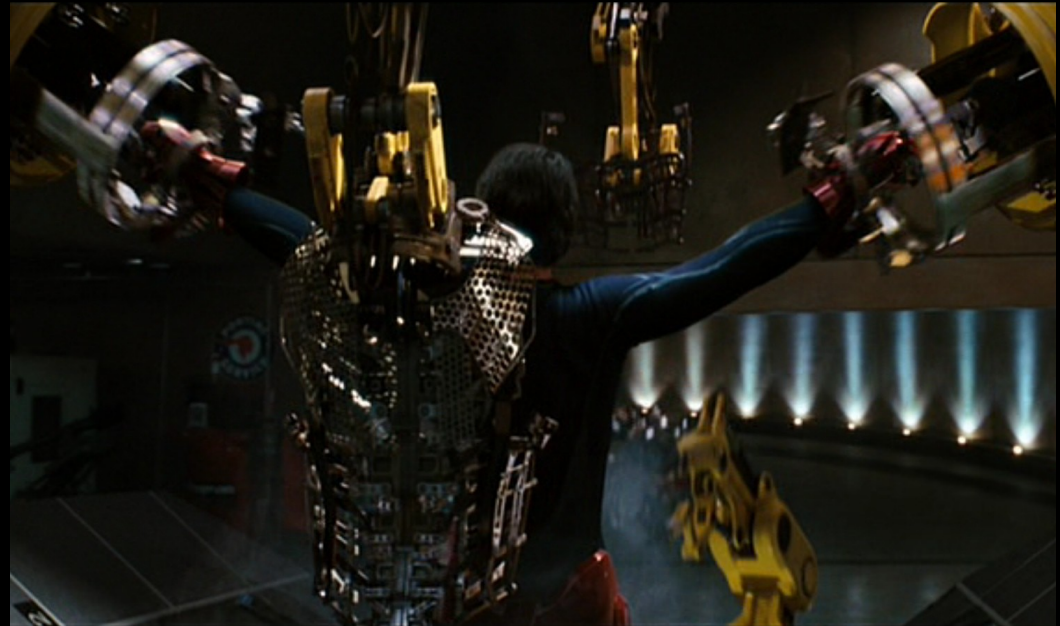
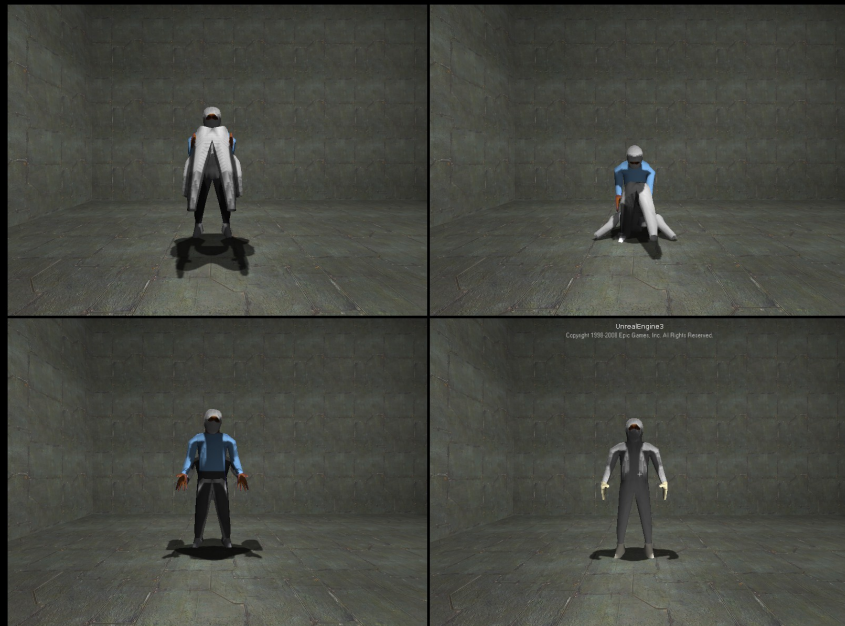
# Semiconductor/nanotechnology fabrication training game



## FabLab Demo Reel

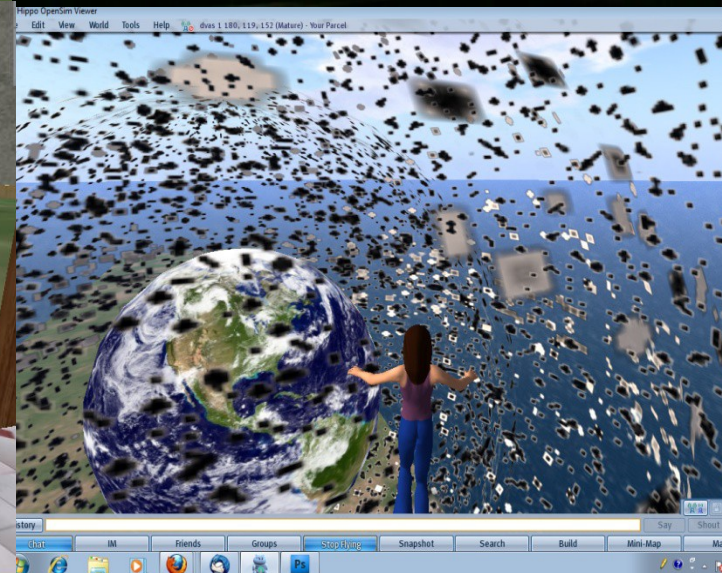
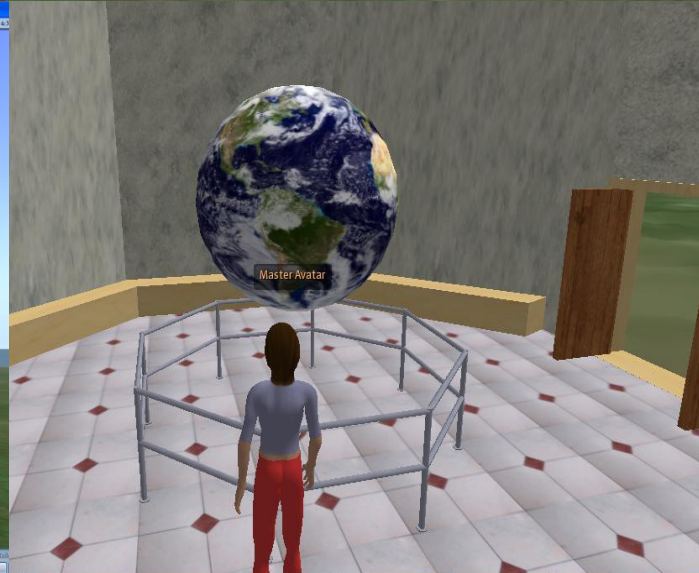
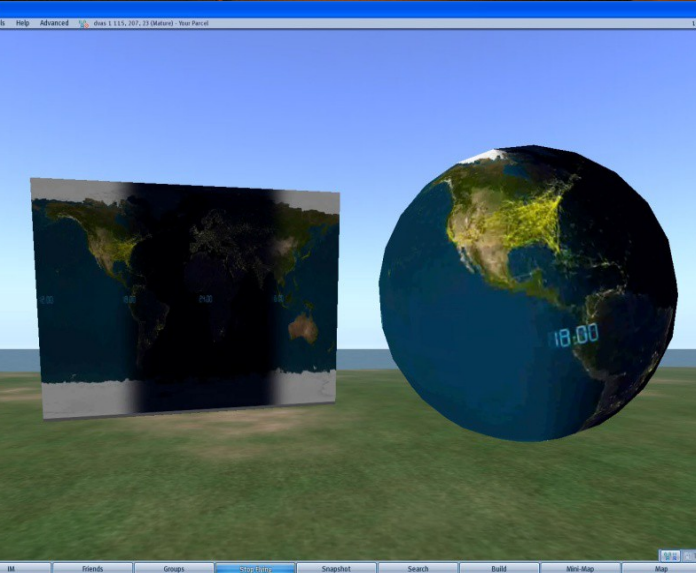
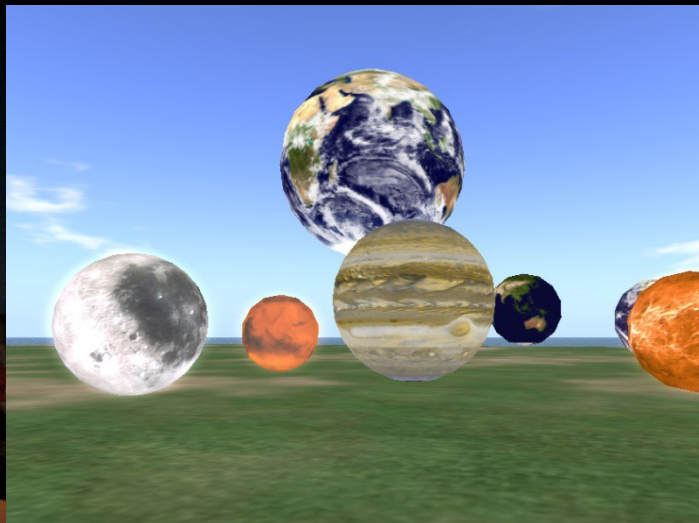
Scacchi, W. (2010). *Game-Based Virtual Worlds as Decentralized Virtual Activity Systems*, in W.S. Bainbridge (Ed.), *Online Worlds: Convergence of the Real and the Virtual*, Springer, New York, 225-236.

# Semiconductor/nanotechnology fabrication training game: “gowning processes”





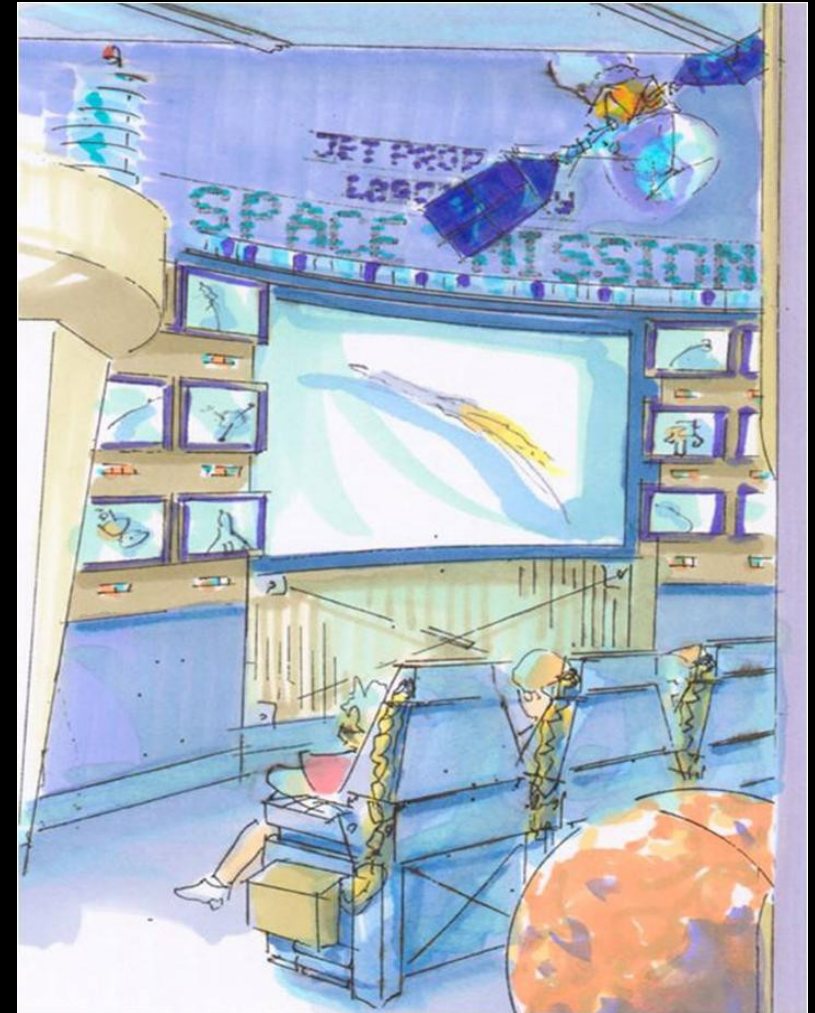
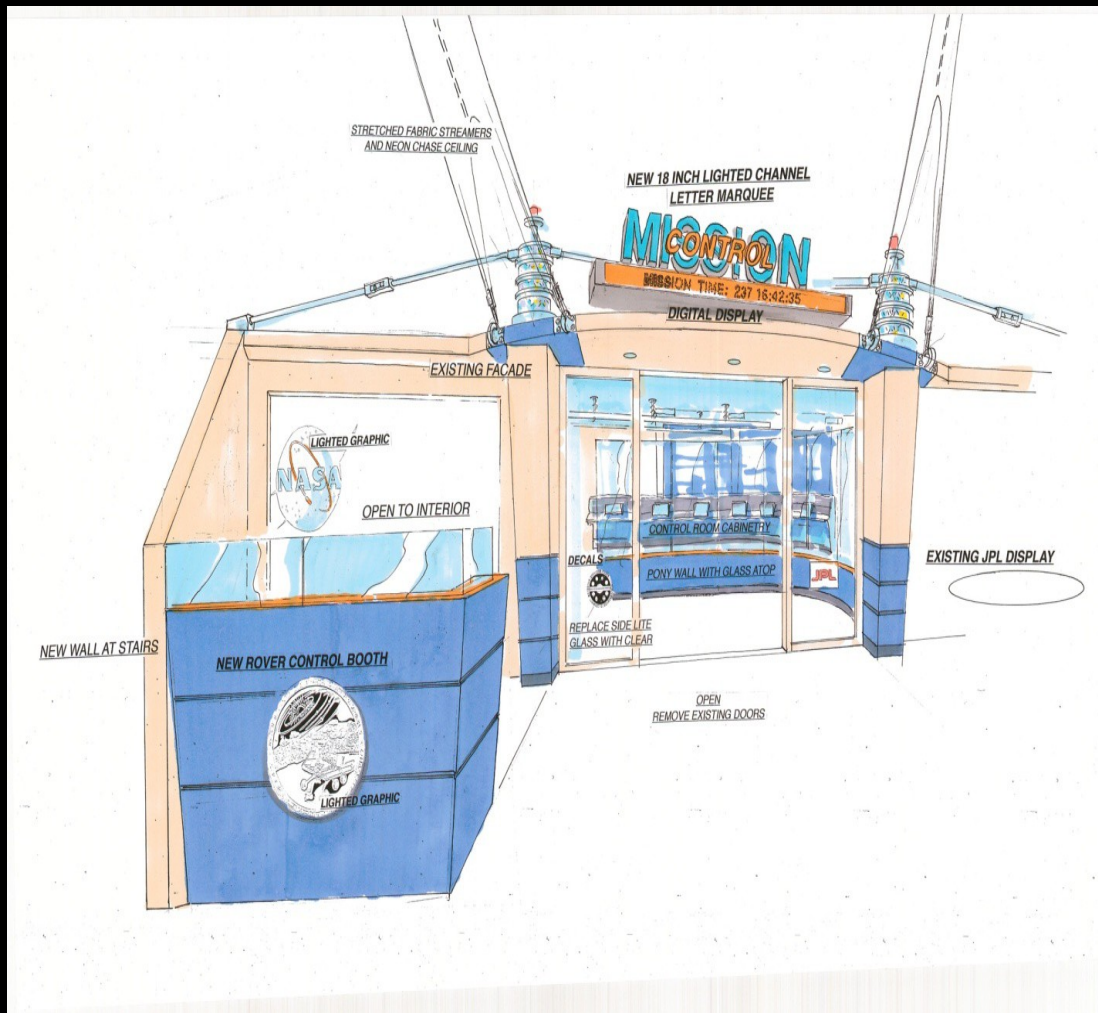
# Planetary science data visualization and “spherecasting” support: *NOAA Science on a Sphere* installation in *Opensim* VW platform



Supporting virtual exploration of planetary and near-earth objects (space debris, small satellites, near-earth asteroids)



# Mission Control Room: Vision for *Discovery Science Center*

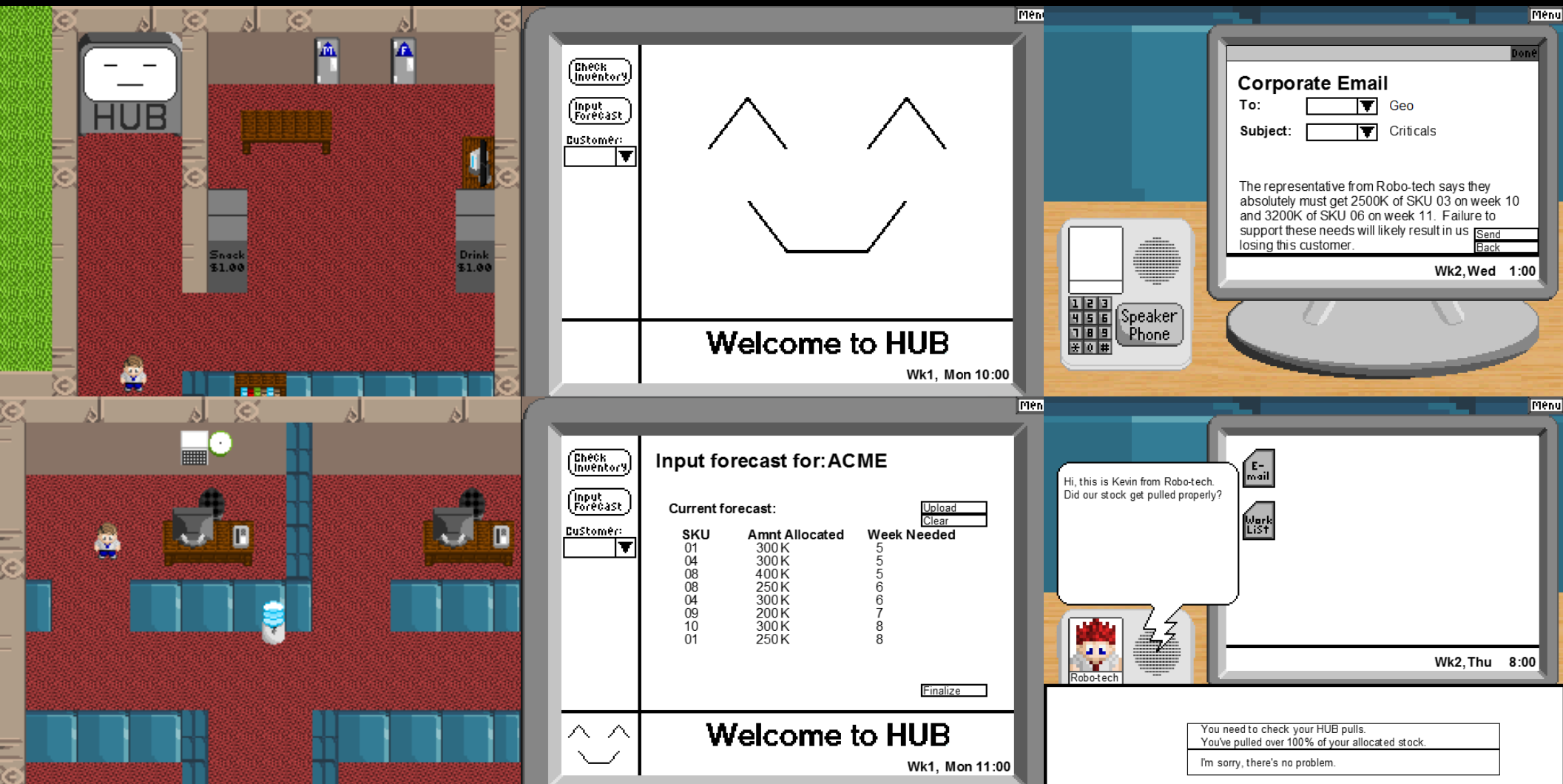




# VW for experimental studies in decentralized command and control centers using open source software (*OpenSim*)



***CBA*: Customer relations training system implemented using low-cost, rapid micro-development cycle**





# 2D, side-scrolling, *World of Warcraft* inspired, role-playing game and CGVW development/modding kit

Aoedipus.net



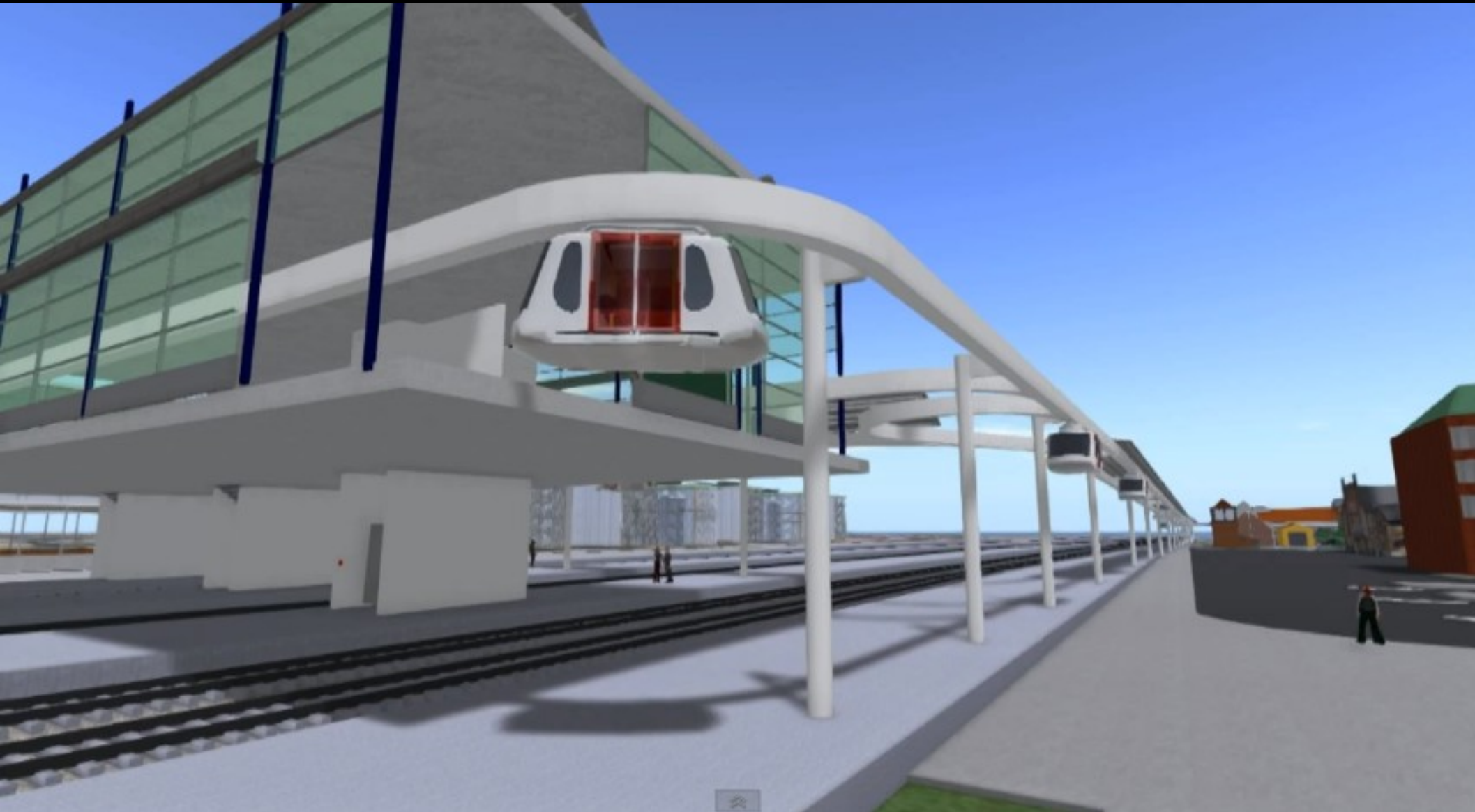


# Envisioning a virtual social computing world



Virtual Life Demo Reel

# Modeling and Simulating the design of a Personal Rapid Transit system for Uppsala, Sweden





# Game-based VW incorporating real-world news feeds and geopolitically located Twitter feeds





# Game-based VW simulator interfaces for immersive motorsports racing experiences





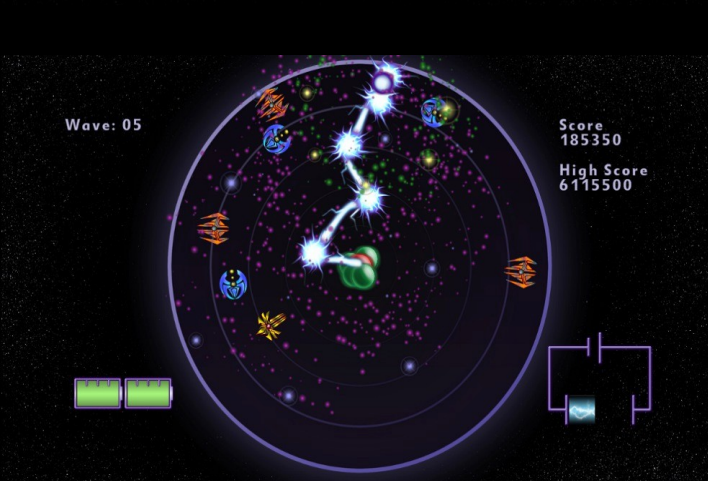
# Game-based VW simulator you can actually drive in physical world! -- *OutRun* @ UCI



<http://www.conceptlab.com/outrun>



# Community development concept: Supporting UCI video game developers club projects (sample)





# Community development concept: Supporting UCI video game developers club via Computer Game Science Laboratory





# Community development concept: *IEEE Intercollegiate Computer Game Development Showcase* (2012-2013)



[HOME](#) [EVENT](#) [GUIDELINES](#) [JUDGES](#) [SPONSORS](#) [CONTACT US](#)

[ORGANIZING COMMITTEE](#) [SPECIAL TEDX EVENT](#)

## Intercollegiate Game Showcase 2013



**game**  
Programming skills on Fire

University of California at Irvine (UCI)  
Saturday April 27, 2013 at 2:00PM

COMPETE in our Game Contest, Win PRIZES,  
EARN ACHIEVEMENTS & FINE TUNE YOUR SKILLS



### Game Event

details about game event

Venue: University of California at Irvine in Bren Hall, Saturday, April 27. Setup starts at 11:00 AM. Main event starts at 2:00PM and ends at 4:00PM, followed by a reception with game demos from 4:00PM to 6:00PM.... [READ MORE](#)



### Our Esteemed Sponsors

making this event possible

We have attracted even more sponsors this year, helping us make this event more exciting than ever. Please support these fine schools and companies... [SEE COMPLETE LIST](#)



### Submission Guidelines

our submission rules etc.

Submissions begin on April 1, 2013 at 12:01AM Pacific Time (PST), and end on April 7, 2013 at 8:00AM Pacific Time (PST). Finalists will be selected based on their one page Executive Summary and 3-5 minute YouTube video submissions.... [READ MORE](#)

# Informal Classical Music Learning Game Environment

## SFSKIDS

FUN & GAMES WITH MUSIC

## Discover Music

Under the Sea of Knowledge.



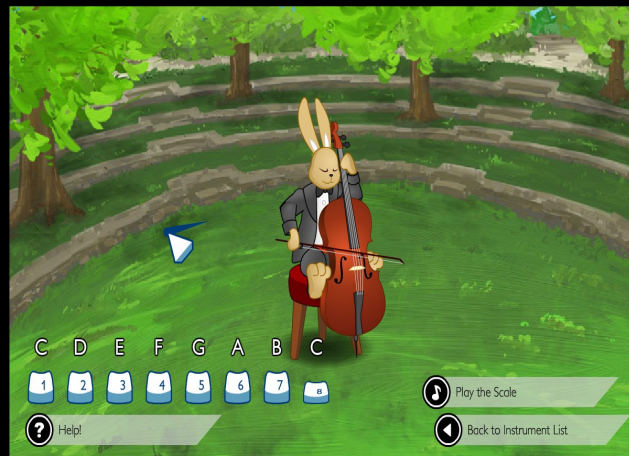
## Play with Music

Above the Musical Skies



## Perform Music

In the Instrument Garden



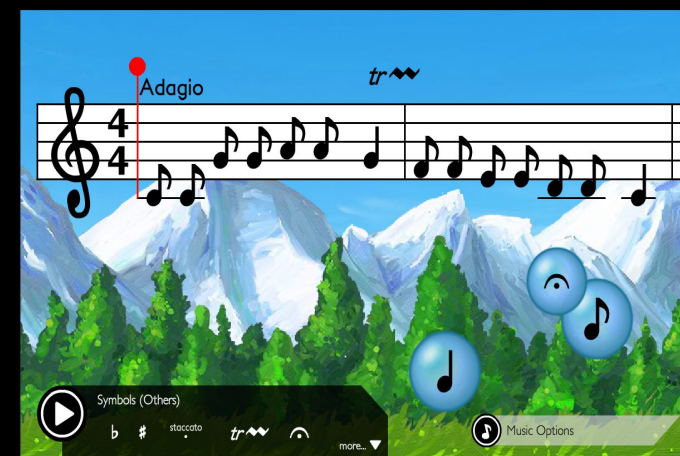
## Conduct Music

At the Symphony Hall



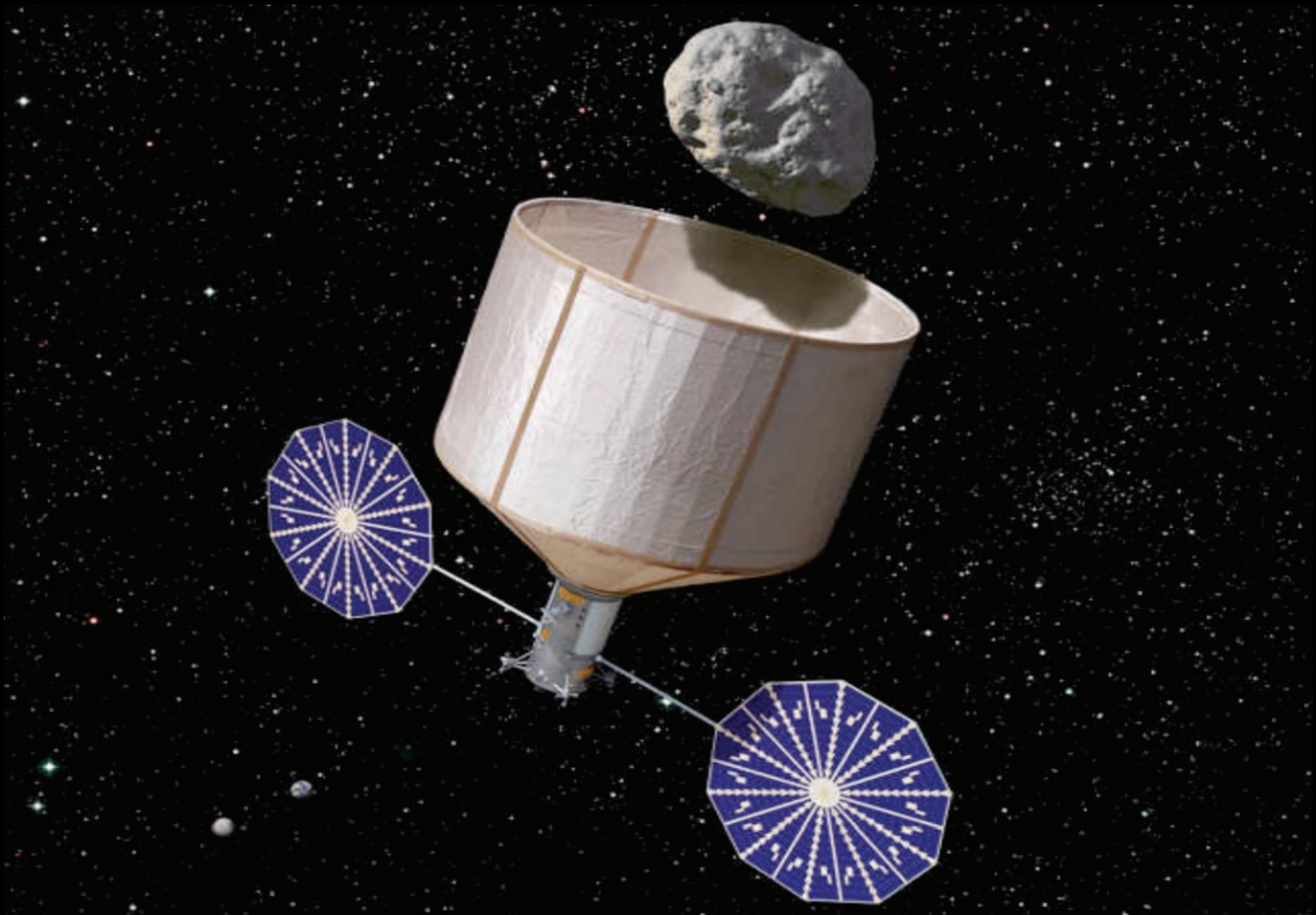
## Compose Music

Atop the Mountain of Muses





New project: develop reusable framework for developing “science mission games”



Sample project game: *Capture a near-earth asteroid*

# Game-Based Worlds for Neuroscience

Adventure/Quest games for learning neuroscience via experiments in simulated brain/anatomical testbeds to study:

- Neurobiological processes
- Disease and drug pathologies
- Brain repair and rehabilitation
- Brain-computer interaction (HMD, EMM, EEG, 5.1 headphones)





# Research Collaborators

## *Faculty*

— Robert Nideffer, Thomas Alspaugh, Jill Berg, Yunan Chen, Steve Cramer, Alfred Kobsa, Jung-Ah Lee, Crista Lopes, Gloria Mark, Bonnie Nardi, David Redmiles, Richard Taylor, and others

## *Post-Doctoral Scholars*

— Garnet Hertz (UCI LUCI)

## *Research Staff*

— Craig Brown (SMU), Yuzo Kanomata (VDIO), Kari Nies (HRI/ISR), Alex Szeto (ISR)

# Acknowledgements

- National Science Foundation, grants #0808783 #1041918, #1256593
- Discovery Science Center, Naval Postgraduate School (Center for Edge Power), Intel, Northrop-Grumman, San Francisco Symphony, UCI (School of Medicine) Anatomy & Neurobiology, (School of Biological Sciences) Neurobiology and Behavior.
- Digital Industry Promotion (DIP) Agency, Daegu, South Korea
- UCI Video Game Developers Club
- ◉ *No review, approval, or endorsement implied.*