Software for Collaborative Science Learning Games

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Overview

• Research Problems
• Approach
• Related efforts
• Conclusions
The genie effect that takes place when you start or minimise an application via the "Dock Preferences" or via "control and left mouse button" on the dock.

The default animation effect called "genie" can be quite processor-intensive. It might be worth choosing one of the alternatives below. You can, of course, have a look at the documentation.

The following instructions outline how to change the animation effect:

1. Open a Terminal Window
2. Type in one of the following commands to change the effect:
   - defaults write com.apple.dock minfEffect suck
   - defaults write com.apple.dock minfEffect genie
   - defaults write com.apple.dock minfEffect scale
3. You then need to either logout and login back in, or just restart.
Discover the cosmos! Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer.

2003 September 4

Composite Crab

Credit: J. Hester (ASU) et al.. CXC, HST, NASA

Explanation: The Crab Pulsar, a city-sized, magnetized neutron star spinning 30 times a second, lies at the center of this composite image of the inner region of the well-known Crab Nebula. The spectacular picture combines optical data (red) from the Hubble Space Telescope and x-ray images (blue) from the Chandra Observatory, also used in the popular Crab Pulsar movies. Like a cosmic dynamo the pulsar powers the x-ray and optical emission from the nebula, accelerating charged particles and producing the eerie, glowing x-ray jets. Ring-like structures are x-ray emitting regions where the
About ORBITER

ORBITER is a free flight simulator that goes beyond the confines of Earth’s atmosphere. Launch the Space Shuttle from Kennedy Space Center to deploy a satellite, rendezvous with the International Space Station or take the futuristic Delta-glider for a tour through the solar system - the choice is yours.

But make no mistake - ORBITER is not a space shooter. The emphasis is firmly on realism, and the learning curve can be steep. Be prepared to invest some time and effort to brush up on your orbital mechanics background. A good starting point is JPL’s [Space Flight Learners’ Workbook](http) - or you could tap into the accumulated knowledge base of the [Orbiter community](http) to get advice.

News


The second patch (build 050216) introduces a number of small but essential improvements to the 2005 Edition of Orbiter, including fixes to orbit stability problems, a virtual cockpit for the Shuttle A, and other upgrades. See the change
Welcome to CSPORTS.net

Worldwide Rankings and Stats
Welcome to the most comprehensive ranking and stats system in the world for online gamers. From Half Life to Battlefield:Vietnam, CSPorts.net tracks the performance of individuals, clans and games providing definitive worldwide rankings. To find out how good you are just use the quicksearch tool at the top of the menu.

Optimal Online Gaming
We provide a suite of tools to help you get more from your online gaming. Rank freezing, buddy tracking, a customisable home page, ranking banners and much more. Do you preform better then your buddies? Find players and where they play and much more. Check out the features below.

What’s on CSPORTS.net

CSPORTS.net News
June Draw - Extra Prizes
Custom Clan Stats
Connect3D ATI X800 Review
Rank Banner Designer Beta Release
**HOT** June Draw - $265 Game Server Rental
March Prize Draw Winners
**HOT** Review: AudioFX Gaming Headset
Csports.net Teams Up With betOG

What’s on CSPORTS.net

All-time Player Names 411,997,165
Active Players 21,655,238
Player Hours Today 3,056,344
Players Online Now 159,766
Servers Online Now 86,313
Modifications Recorded 3,072
Maps Recorded 315,318
Registered Members 183,238
Game Research Grid

• A networked, clustered computing environment for researching, developing, playing and experiencing (beyond) next generation computer games and game worlds.
  – Not just Web services framework and computing grid fabric.
• But a testbed, archive, community and venue for new ways of developing, deploying, and performing game-based synthetic or mixed reality environments across a variety of (heterogeneous) platforms.
• See [www.ucgamelab.net](http://www.ucgamelab.net) and [visservices.npaci.edu/gaming/gridsite/](http://visservices.npaci.edu/gaming/gridsite/)
(One) Game Grid research problem

• What is the best way to rapidly create networked game worlds and play experience?
  – “best” =>
  • faster, better, cheaper
  • open source (e.g., BSD/MIT style license)
  • (global) community-based development, contribution and support
  • Fun, enjoyable, intrinsically motivating, disruptive, etc.

• Modification, Construction, or Generation?
Proposed solutions

• Modification
  – Hack existing game content, levels, engine
  – Repurpose content/data from other sources

• Construction
  – Scripting (*UnrealScript* vs. *C-shell*/Perl/Python/…)
  – Custom programming using SDK and other tools

• Generation
  – Parameter value instantiation
  – Macro expansion
  – Language-directed (game) application generation
  – Meta-environments tailored for (game) domain
Proposed solutions: evaluation

• Generation
• Modification
• Construction

Automated support?
Ease of use/development?
Flexibility?
Approach

• Investigate the development and use of *meta-environments* for new game domains
  – Support generation, modification, and construction techniques and tools
  – Target (non-traditional) game domains relevant to artists, scientists, humanists, software developers, gamers, etc.
Related R&D efforts

• visual and performing arts
  – e.g., machinima

• science and technology education
  – informal education in science

• humanities and social sciences
  – graphic narratives for storytelling

• alternative game cultures and venues
  – hot rod game machines and GameCon’s
Informal Science Education as a Community for Science Learning Games?

- Science Games
- Quantum Physics Game
- (Mechanical) Systems Engineering Game
- Dinosaur and Life Science Game
Accelerate the Particle

Play Game

(may take a few moments to load)

game created by CERN

The Heart of the Matter

Research at CERN that garnered a Nobel Prize in 1984: Carlo Rubbia and Simon van der Meer for the discovery of the “W and Z particles, communicators of the weak interaction.”

Origins

© 2000 The Exploratorium
### Strategy, Gearing, and Brakes

<table>
<thead>
<tr>
<th>Tyres</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting fuel</td>
<td>17.2 gal (9 Laps)</td>
</tr>
<tr>
<td>N of stops</td>
<td>3</td>
</tr>
<tr>
<td>1st stop</td>
<td>17.2 gal (9 Laps)</td>
</tr>
<tr>
<td>2nd stop</td>
<td>17.2 gal (9 Laps)</td>
</tr>
<tr>
<td>3rd stop</td>
<td>17.2 gal (9 Laps)</td>
</tr>
<tr>
<td>Weight dist.</td>
<td>40.0:60.0</td>
</tr>
<tr>
<td>Steering lock</td>
<td>20.0 Degrees</td>
</tr>
<tr>
<td>Rev limit</td>
<td>6700</td>
</tr>
<tr>
<td>Radiator opening</td>
<td>4</td>
</tr>
<tr>
<td>Engine temp</td>
<td>-460 F.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gear</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st gear</td>
<td>16/40 (7.708)</td>
</tr>
<tr>
<td>2nd gear</td>
<td>19/35 (5.680)</td>
</tr>
<tr>
<td>3rd gear</td>
<td>23/33 (4.424)</td>
</tr>
<tr>
<td>4th gear</td>
<td>26/30 (3.558)</td>
</tr>
<tr>
<td>5th gear</td>
<td>28/28 (3.083)</td>
</tr>
<tr>
<td>6th gear</td>
<td>29/26 (2.764)</td>
</tr>
<tr>
<td>Final</td>
<td>12/37 (Bevel 1/1)</td>
</tr>
<tr>
<td>Reverse</td>
<td>16/40 (7.708)</td>
</tr>
<tr>
<td>Diff lock</td>
<td>20%</td>
</tr>
</tbody>
</table>

| Brake bias | 65.0:35.0 |
| Brake duct | 4         |

<table>
<thead>
<tr>
<th>Front brake disc temp</th>
<th>Rear brake disc temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>-460 F.</td>
<td>-460 F.</td>
</tr>
<tr>
<td>0.00 in</td>
<td>0.00 in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brake wear remaining</th>
<th>Brake wear remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>Right</td>
</tr>
<tr>
<td>0.00 in</td>
<td>0.00 in</td>
</tr>
</tbody>
</table>

**RPM Chart**

![RPM Chart](chart.png)

**MPH Chart**

![MPH Chart](chart2.png)
Online interaction

- Player sees virtual representation of fossil dig pit and skeletal mold table
- Table shows bones that were placed while in physical environment
- Player can complete skeletal reconstruction fully activating map region
- Activity events stored in centralized database at DSC on an individual/group level
- Upon activation, creatures animate and “come to life”
Physical interaction

• Discovering fossil bones (digging)
• Measuring bones
• Identifying bones
• Placing bones into skeletal mold table
• This triggers a signal that the task has been accomplished, activating the map region for that user
Addressing science education standards

• Communicates about investigations
• Understands that learning can come from careful observations and simple experiments
• Recognizes how factors such as gravity can affect common objects
• Describes an observed change in terms of starting conditions, ending conditions, using words, simple diagrams, or graphs
• Identifies what does and does not change when matter experiences an external influence such as push, pull, tip.
Comparable efforts

• KineticCity.com
  – Web-only, 2D science learning game for 7th. grade students
  – $1.3M NSF funding, two year development

• Magiquest.com
  – Physical exhibit, visitor tracking and visitor-directed interaction exhibit
  – No online environment, >>$2M funding
Conclusions

• We find F/OSSD is helping to drive computer game culture and technology
• We seek to break down barriers between art, science, technology, culture through computer games, game environments, and experiences
• We seek to create a new generation of informal learning tools and techniques, together with a global community of developers and users, through a massively shared, participatory computing grid.
Further information

- UCI Game Lab: [www.ucgamelab.net](http://www.ucgamelab.net)
- Game Research Grid: [visservices.npaci.edu/gaming/gridsite/](http://visservices.npaci.edu/gaming/gridsite/)
Acknowledgements

• Discovery Science Center
• National Science Foundation
• Butterfly.net (now Emergent Game Technologies)
• SUN Microsystems
• Digital Industry Promotion, Daegu City, Korea