

Software for Collaborative Science Learning Games

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and

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Technology

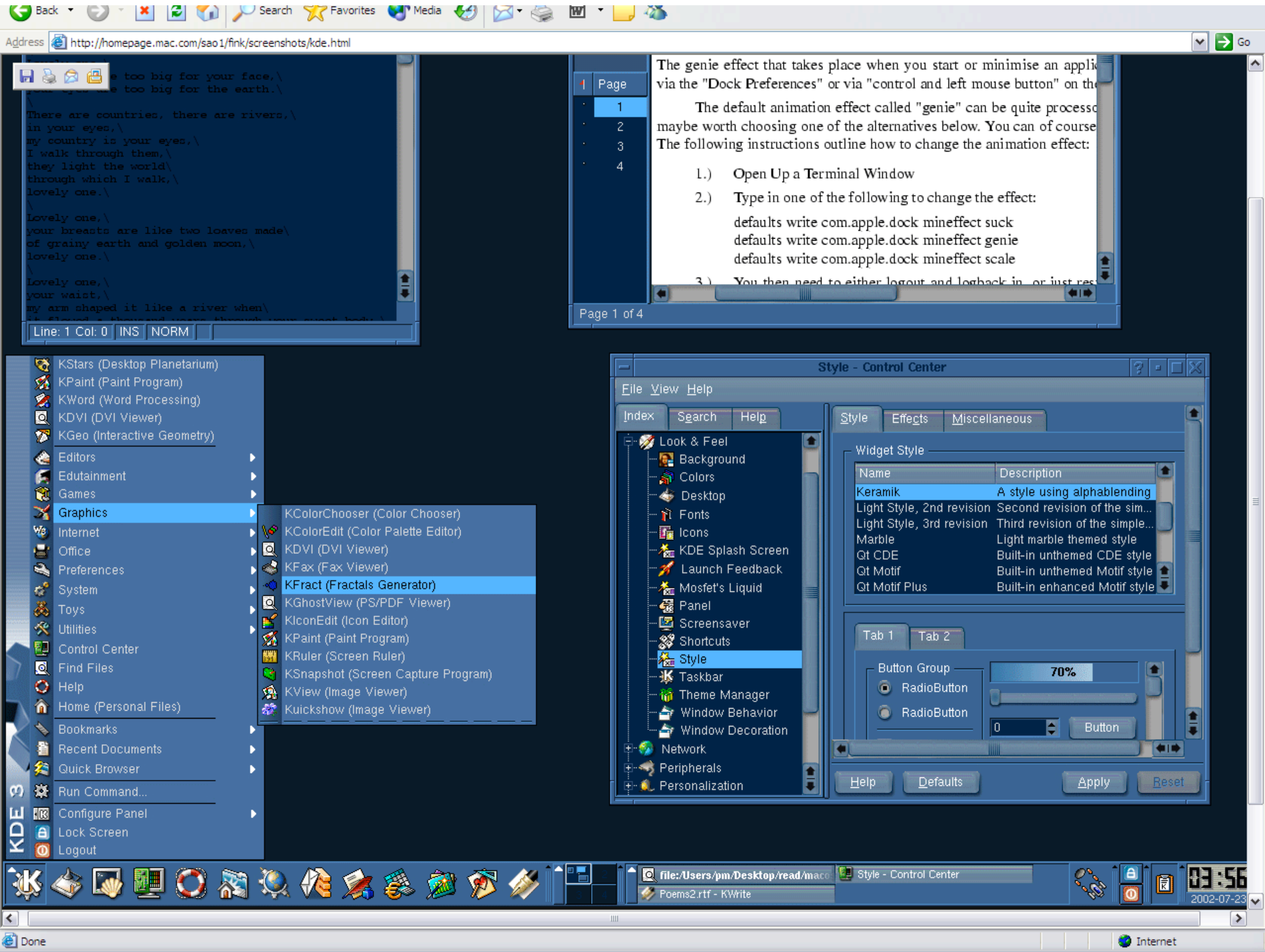
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Overview

- Research Problems
- Approach
- Related efforts
- Conclusions



```
... too big for your face,\n... too big for the earth.\n\nThere are countries, there are rivers,\nin your eyes,\nmy country is your eyes,\nI walk through them,\nthey light the world,\nthrough which I walk,\nlovely one.\n\nLovely one,\nyour breasts are like two loaves made\nof grainy earth and golden moon,\nlovely one.\n\nLovely one,\nyour waist,\nmy arm shaped it like a river when\nit flowed through your throat...
```

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 can be quite process intensive. The default animation effect called "genie" can be quite process intensive. It may be worth choosing one of the alternatives below. You can of course choose any of the alternatives. The following instructions outline how to change the animation effect:

- 1.) Open Up a Terminal Window
- 2.) Type in one of the following to change the effect:
defaults write com.apple.dock mineffect suck
defaults write com.apple.dock mineffect genie
defaults write com.apple.dock mineffect scale
- 3.) You then need to either logout and logback in, or just restart the system.

- KStars (Desktop Planetarium)
- KPaint (Paint Program)
- KWord (Word Processing)
- KDVI (DVI Viewer)
- KGeo (Interactive Geometry)
- Editors
- Edutainment
- Games
- Graphics
 - KColorChooser (Color Chooser)
 - KColorEdit (Color Palette Editor)
 - KDVI (DVI Viewer)
 - KFax (Fax Viewer)
 - KFract (Fractals Generator)**
 - KGhostView (PS/PDF Viewer)
 - KIconEdit (Icon Editor)
 - KRuler (Screen Ruler)
 - KSnapshot (Screen Capture Program)
 - KView (Image Viewer)
 - Kuickshow (Image Viewer)
- Internet
- Office
- Preferences
- System
- Toys
- Utilities
- Control Center
- Find Files
- Help
- Home (Personal Files)
- Bookmarks
- Recent Documents
- Quick Browser
- Run Command...
- Configure Panel
- Lock Screen
- Logout

Style - Control Center

File View Help

Index Search Help

- Look & Feel
 - Background
 - Colors
 - Desktop
 - Fonts
 - Icons
 - KDE Splash Screen
 - Launch Feedback
 - Mosfet's Liquid
 - Panel
 - Screensaver
 - Shortcuts
 - Style**
 - Taskbar
 - Theme Manager
 - Window Behavior
 - Window Decoration
- Network
- Peripherals
- Personalization

Style Effects Miscellaneous

Widget Style

Name	Description
Keramik	A style using alphablending
Light Style, 2nd revision	Second revision of the simple...
Light Style, 3rd revision	Third revision of the simple...
Marble	Light marble themed style
Qt CDE	Built-in unthemed CDE style
Qt Motif	Built-in unthemed Motif style
Qt Motif Plus	Built-in enhanced Motif style

Tab 1 Tab 2

Button Group 70%

RadioButton

RadioButton

0 Button

Help Defaults Apply Reset

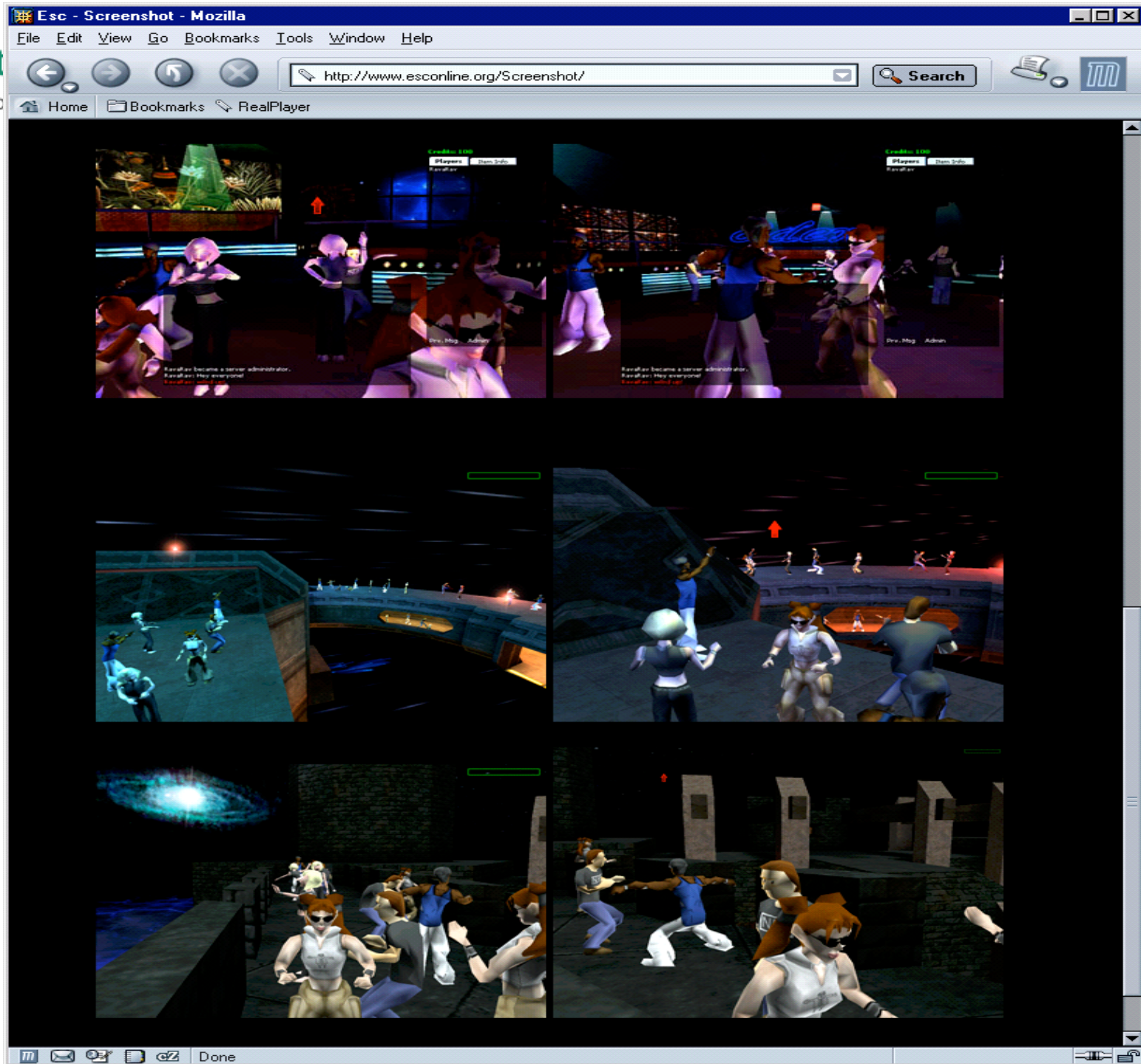


unrealtournament.com



BACK

NEXT



Astronomy Picture of the Day

[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



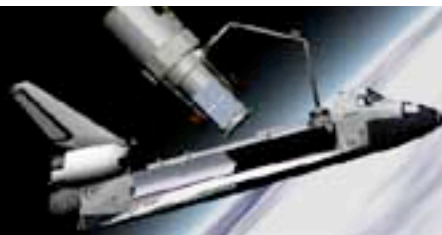
Composite Crab

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

ORBITER

SPACE FLIGHT SIMULATOR



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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](#) - or you could tap into the accumulated knowledge base of the [Orbiter community](#) to get advice.

News

February 16, 2005: ORBITER 2005 Edition: Patch 2 released

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](#)



Orbiter is free - but if

CSP^{ORTS}.NET

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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 perform better than your buddies? Find players and where they play and much more. Check out the features below.

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

What's on CSPORTS.net

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 and 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

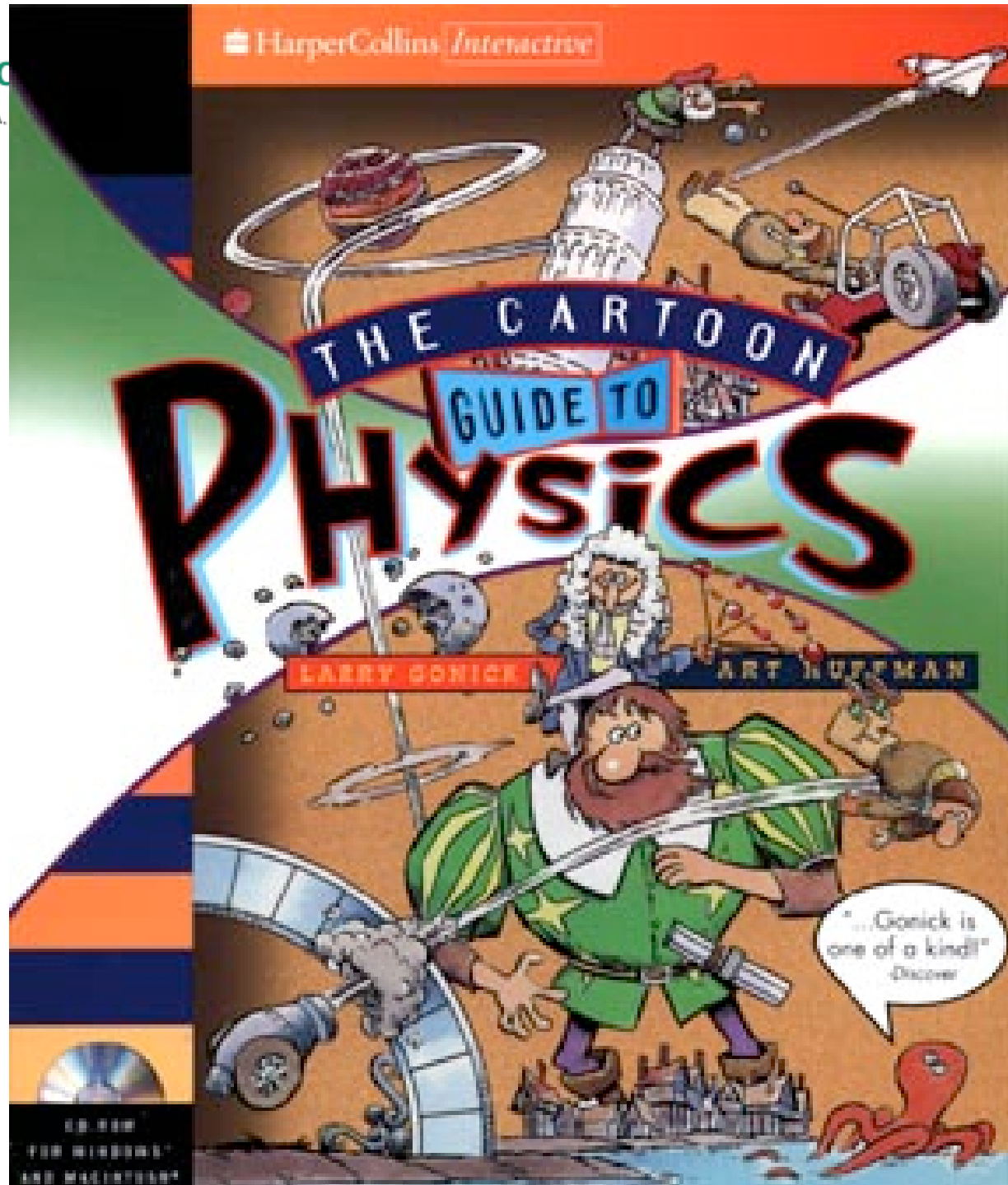
- Investigate the development and use of *meta-environments* for new game domains
 - Support generation, modification, and construction techniques and tools
 - Target (non-traditional) game domains relevant to artists, scientists, humanists, software developers, gamers, etc.

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*

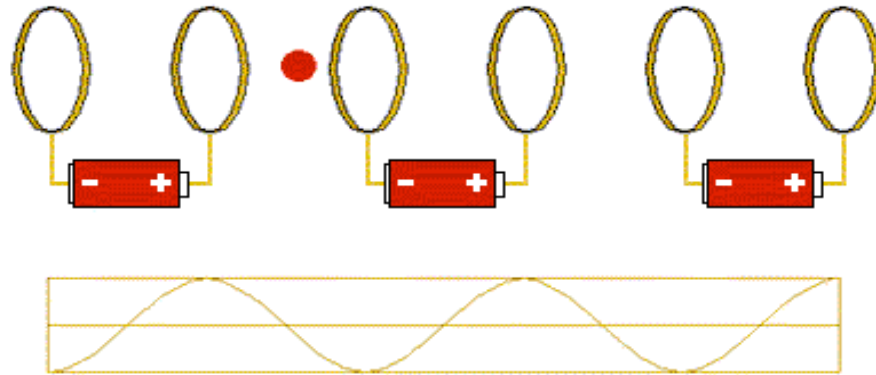
Informal Science Education as a Community for Science Learning Games?

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



TOOLS

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

exploratorium

CERN

© 2000 The Exploratorium

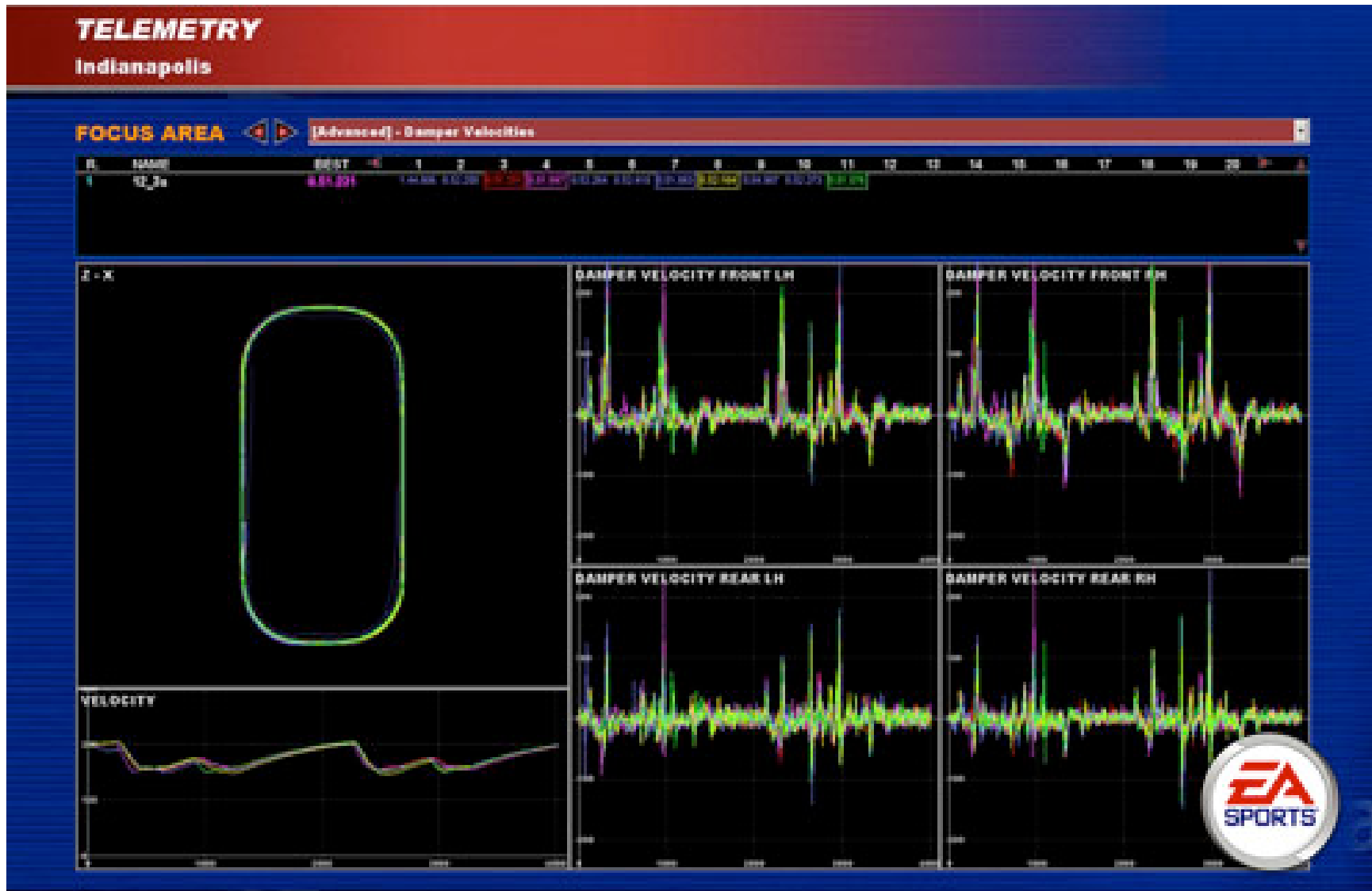
STRATEGY, GEARING AND BRAKES

tyres	Medium	brake bias	65.0:35.0
starting fuel	17.2 gal (9 Laps)	brake duct	4
# of stops	3		
1st stop	17.2 gal (9 Laps)		
2nd stop	17.2 gal (9 Laps)		
3rd stop	17.2 gal (9 Laps)		
weight dist.	40.0:60.0		
steering lock	20.0 Degrees		
rev limit	6700		
radiator opening	4		
engine temp	-460 F.		
1st gear	16/40 (7.708)		
2nd gear	19/35 (5.680)		
3rd gear	23/33 (4.424)		
4th gear	26/30 (3.558)		
5th gear	28/28 (3.093)		
6th gear	29/26 (2.764)		
final	12/37 (Bevel 1/ 1)		
reverse	16/40 (7.708)		
diff lock	20%		

-460 F.	front brake disc temp	-460 F.
0.00 in	brake wear remaining	0.00 in
left		right
-460 F.	rear brake disc temp	-460 F.
0.00 in	brake wear remaining	0.00 in

RPM

MPH

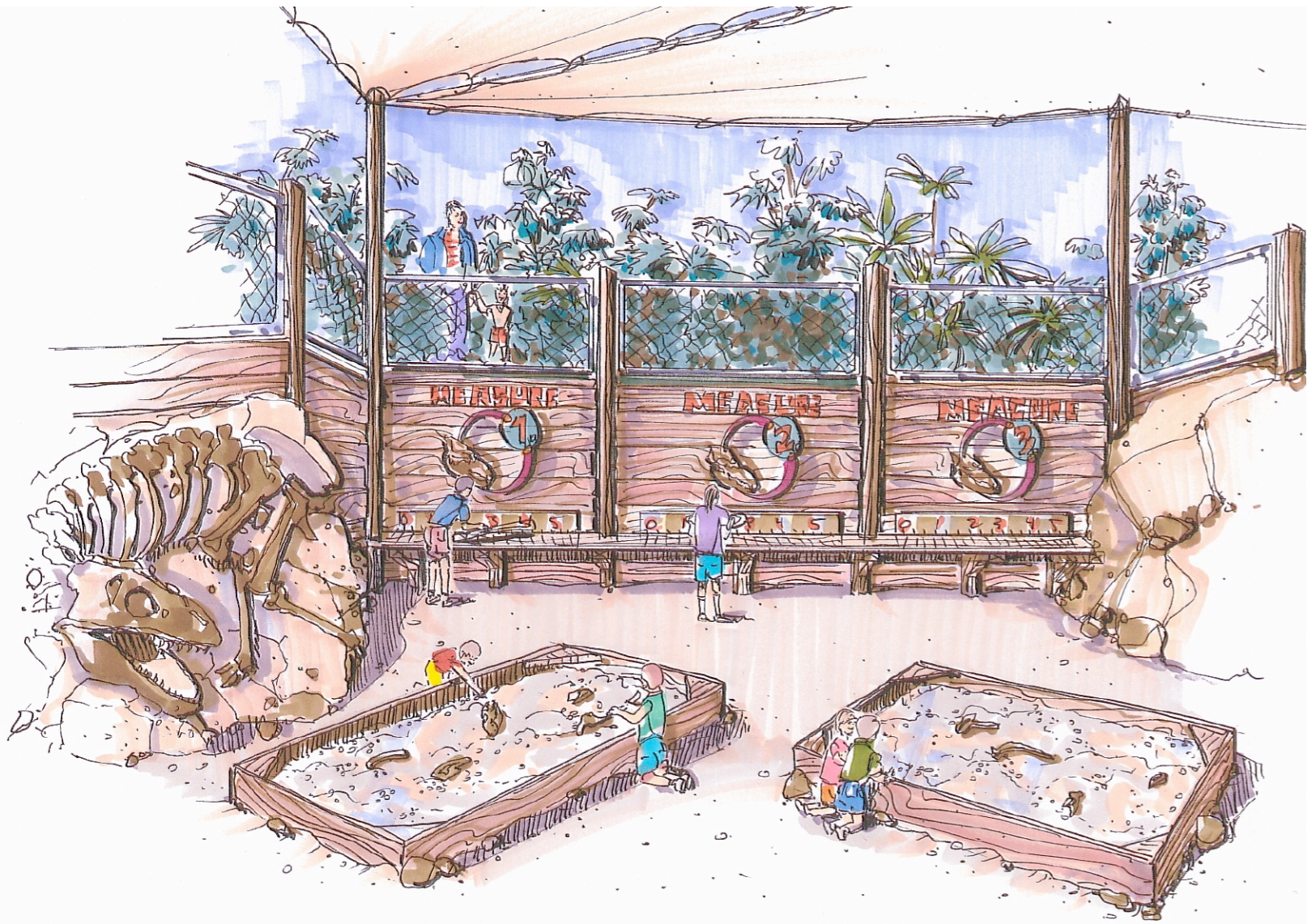




Online interaction

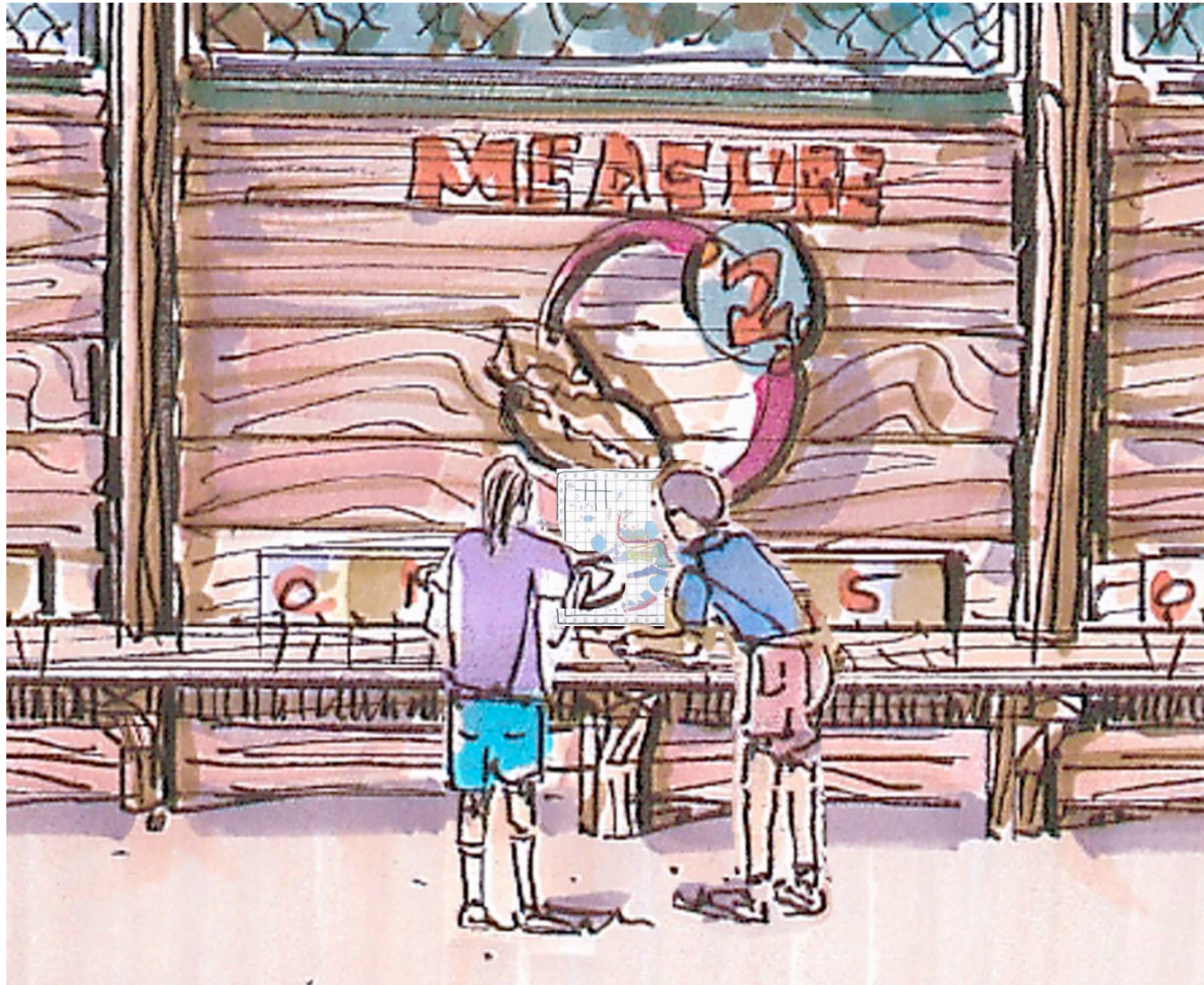
- Player sees virtual representation of fossil dig pit and skeletal mold table
- Table shows bones that were placed while in physical environment
- Player can complete skeletal reconstruction fully activating map region
- Activity events stored in centralized database at DSC on an individual/group level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





DINO DIG PIT AREA

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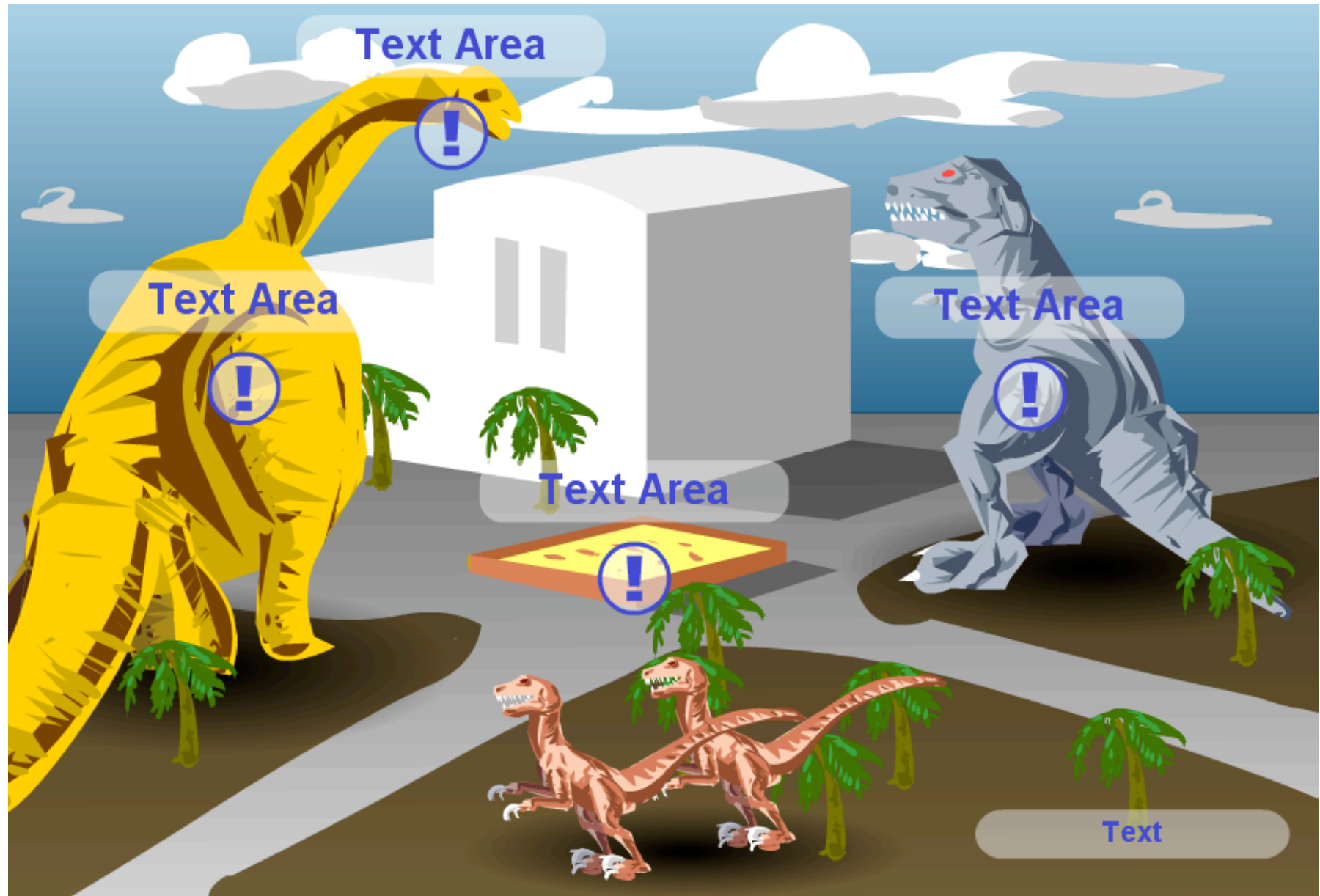
Physical interaction

- 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

GAMES NOW!

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FOR
EDUCATORS

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
- Game Research Grid: visservices.npaci.edu/gaming/gridsite/
- W. Scacchi, [Free/Open Source Software Development Practices in the Computer Game Community](#), *IEEE Software*, 21(1), 59-67, January/February 2004.
- W. Scacchi, [When Worlds Collide: Emerging Patterns of Intersection and Segmentation when Computerization Movements Interact](#), working paper, presented at the [Social Informatics Workshop](#), March 2005.

Acknowledgements

- Discovery Science Center
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- Digital Industry Promotion, Daegu City, Korea