

a tool for experiments: Second Life



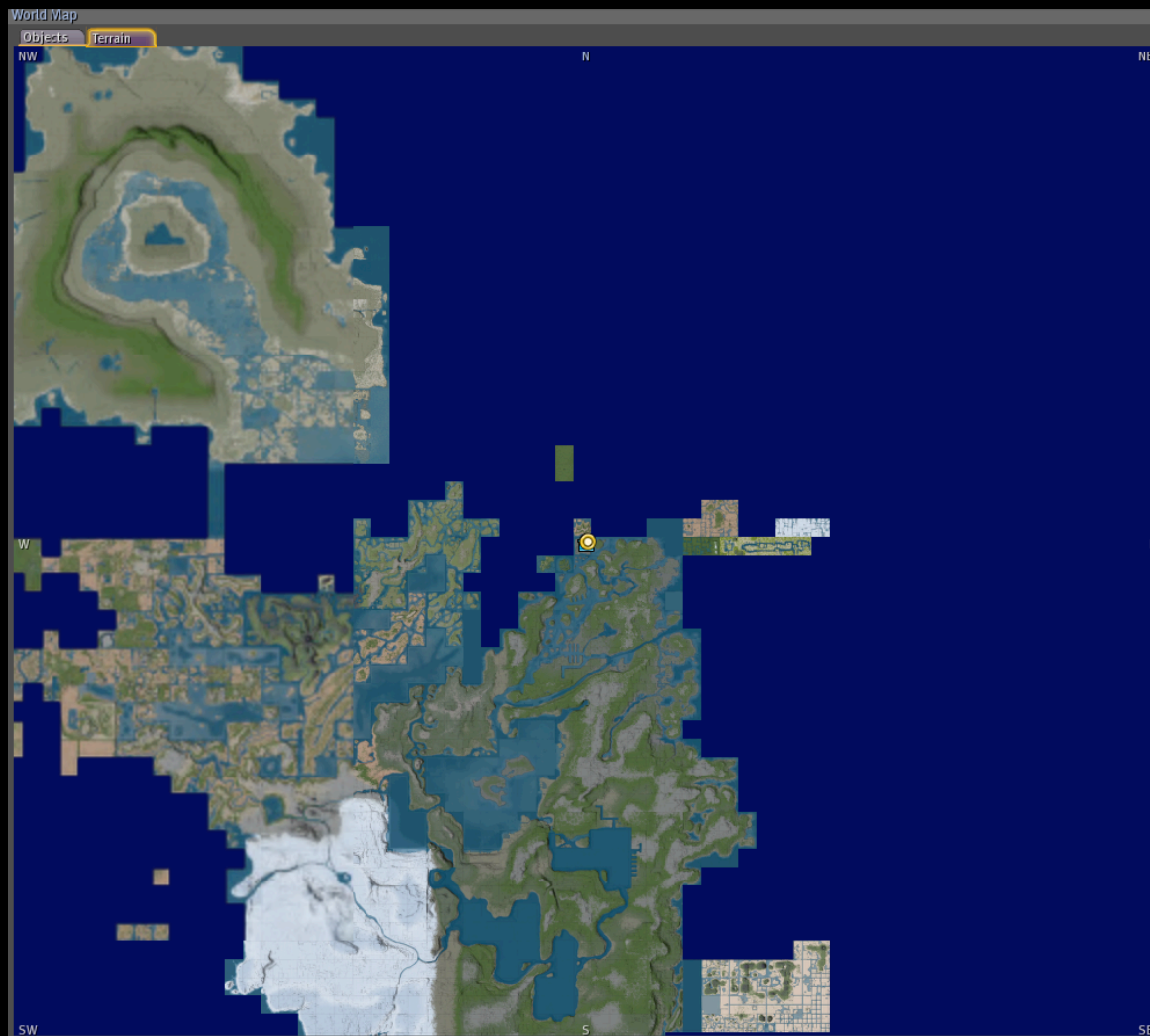
or How I Learned to Stop Worrying and Love LSL
(part 1, *hic sunt leones*)

introductory questions:

- how many of you know C (C++, Obj-C, Java, C# ...)?
- how many of you have heard of Second Life?
- how many of you have a premium Second Life account?

- ... how many of you think the world is flat?

... but the world *is* flat!



in Second Life, that is.

how to begin?

1. create a Second Life account (a free basic account will suffice) if you don't have one already
2. log in
3. populate the world with weird stuff!

■ but first...



some Second Life concepts

- is it an MMO, MMORPG, MMOSG, MUVE ...?

- in SL:
 - ◆ agents \approx avatars
 - ◆ objects
 - ◆ regions \approx simulators
 - ◆ physics simulation



some SL terminology

- *prim* or primitive
 - ★ the simplest building block for SL objects. It's made of polygons.
- *rez* (verb) - to rez an object in SL:
 - ★ to create an object, for example by using `llRezObject()`
- *sim* = simulator \simeq region
- *HUD* or Heads-Up Display = 2D private object



why is SL interesting for academia?

- large audience
- lots of users
- mass media exposure

The New York Times
nytimes.com

January 7, 2007

The Ultimate Distance Learning

By CHRISTINE LAGORIO

SAN FRANCISCO
Business Times

Isaac Greenbaum, a continuing education student at [New York Univ.](#) when his media studies class was settling into a discussion of its next assignment, a brawny, bare-chested figure bounded in wielding a crossbow.

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BUSINESS PULSE SURVEY: [Porn in the Mission](#)

Talk of the town

Virtual world of 'Second Life' is starting to look a lot like Sweden

San Francisco Business Times - February 2, 2007 by [Jim Gardner](#)

why is it interesting? Audience:

- 20 million MMORPG users (end of 2006)
- worldwide trade in *digital goods*: 1-2 billion US\$
- SL has about equal gender use
- older population in SL (median age ~30 yr olds)

is SL different from MMORPGs?

- SL users residents *build* and *own* most content
 - ◆ Linden Labs makes money on land maintenance (simulator runtime cycles)
- IP: creator's intellectual property
- in-world tools are the *main* content creation
 - ◆ most content creation happens in real time, in public

comparison to MMORPGs

- MMORPGs: users spend time to improve skills and advance levels
 - ◆ levels allow you to access new skills and abilities
- according to LL, SL is not a game (so, what's the point?)
 - ◆ there is no goal-conflict-resolution concept built in
 - ◆ all skills are reachable from day 1

what really makes SL so interesting for education and research?

- LSL = Linden Scripting Language
- available client-side to anyone with a basic (*free*) account
- affects agents and objects

SL underlying architecture, server side

- distributed grid of simulators
 - ◆ started with 20 CPUs
 - ◆ now several thousands simulators
 - ★ Debian Linux, Opteron servers
 - ◆ each simulator holds object data and runs scripts (yes, even when everybody logs out)
- each simulator handles 16 *acres* (16 x 256²m)
 - ◆ CPUs are mapped 1-to-1 with SL world geography
- million user processes (scripts) running on the SL grid at once
 - ◆ a few hundred million instructions per second - total!

SL simulators and LSL scripts

- *scripts* and *simulators* are close equivalents to ideal *programs* and *OS* according to the academic definition:
 - ◆ no script shall prevent the simulator from running
 - ◆ no script shall prevent other scripts from running
 - ◆ server-side CPU, memory limits
- *not* a guaranteed real-time system!

physics in SL... realistic simulations?

- Havok, Inc. engine
- rigid body simulation?
- mass, gravity, fluid
 - ◆ (... insert SL demo now...)
- avatar and object animations vs. physics
- rewriting physics simulations in LSL
 - ◆ flight simulators
 - ◆ skateboards

- Acceleration
- Buoyancy
- Energy
- Friction
- Force
- Gravity
- Impulse
- Mass (inertia)
- Torque
- Velocity

intro to content creation in SL

- how do you create content in SL?
 - objects and scripts = modeling and LSL
- how hard is it? LL says
 - web < wikipedia < SL < FPS mods < free SW
 - 25% of active SL user time is spent adding content
- objects:
 - solid-body modeler: not a polygonal modeler
 - client-side interface, server-side modeler (!)

LSL, the Linden Scripting Language

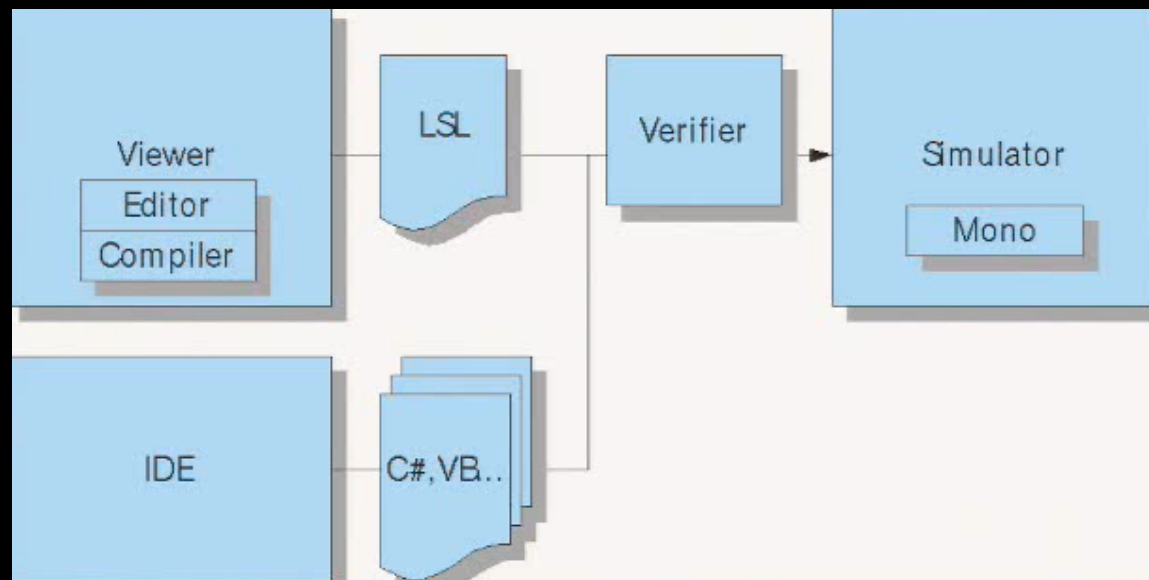
- scripts - just like for objects,
 - client-side editor
 - server-side bytecode interpreter runtime
- syntax is C-like (or Java-like?)
- interesting data types:
 - lists, vectors, quaternions (called *rotations*)

LSL details

- limit: each script no larger than 16kB total (code+data)!
 - message passing between scripts to achieve larger applications
- limits on: replication, emails, HTTP calls, memory, CPU use
- each region (= simulator) can handle several thousand scripts at once
 - the script scheduler is inside the simulator, not by mapping 1-to-1 scripts to OS threads
 - similar to how the JVM works

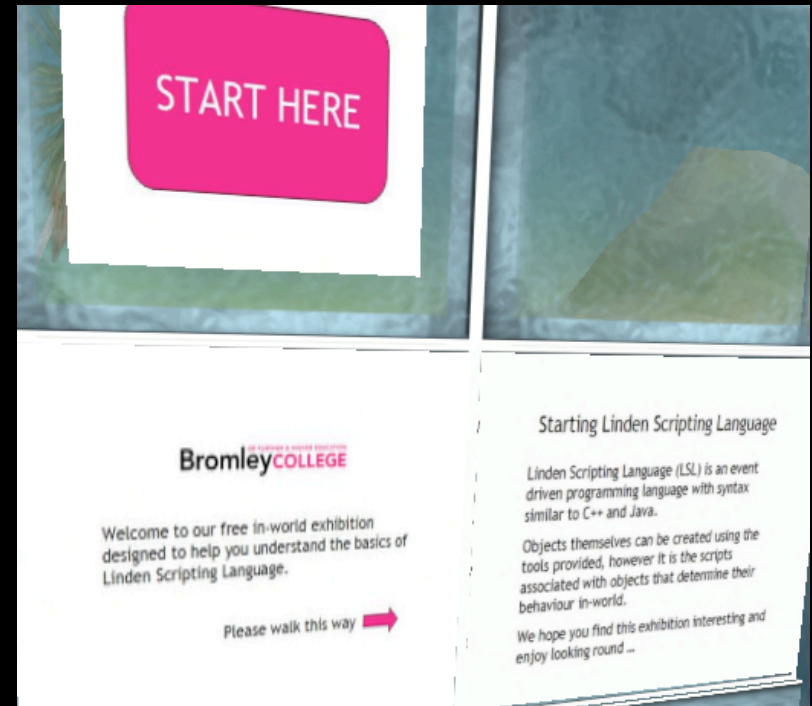
LSL underlying details

- server-side engine: transitioning to MONO-based compiler for LSL
 - will allow other verified bytecode
 - different languages based on CLI
 - LL claims about 100 times *faster* code execution...



LSL documentation: where is it?

- mostly user-supported documentation
- many in-world resources



- LSL wiki at <http://rpgstats.com/>
 - it should go back to <http://lslwiki.com/> sometimes in the near future

LSL semantics

- events
- states
- message-passing

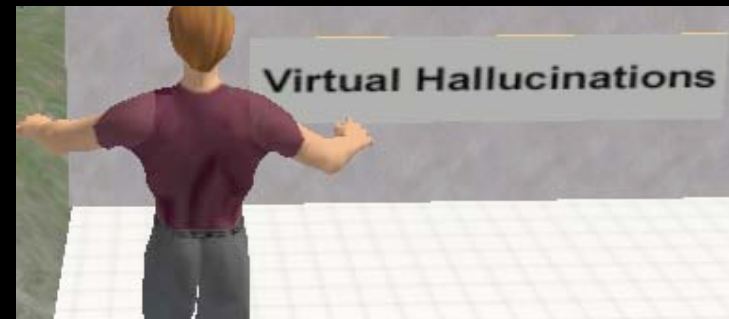
```
Script: New Script
File Edit Help
Default
{
    state_entry()
    {
        llSay(0, "Hello, Avatar!");
    }

    touch_start(integer total_number)
    {
        llSay(0, "Touched.");
    }
}
```

agent (subject) interaction

- subject interaction: agent as main interaction for user in SL
- SL to agent, active:
 - dialog Y/N boxes
 - SL offering an object, L\$, script, ... to agent
 - HUDs
 - SL returning an object, etc (automatically - lost & found)
- agent to SL:
 - direct touch / click actions
 - collision (involuntary?)
 - pie-popup menus
 - agent position detection (invisible)
 - object creation / editing / dropping

research done in Second Life



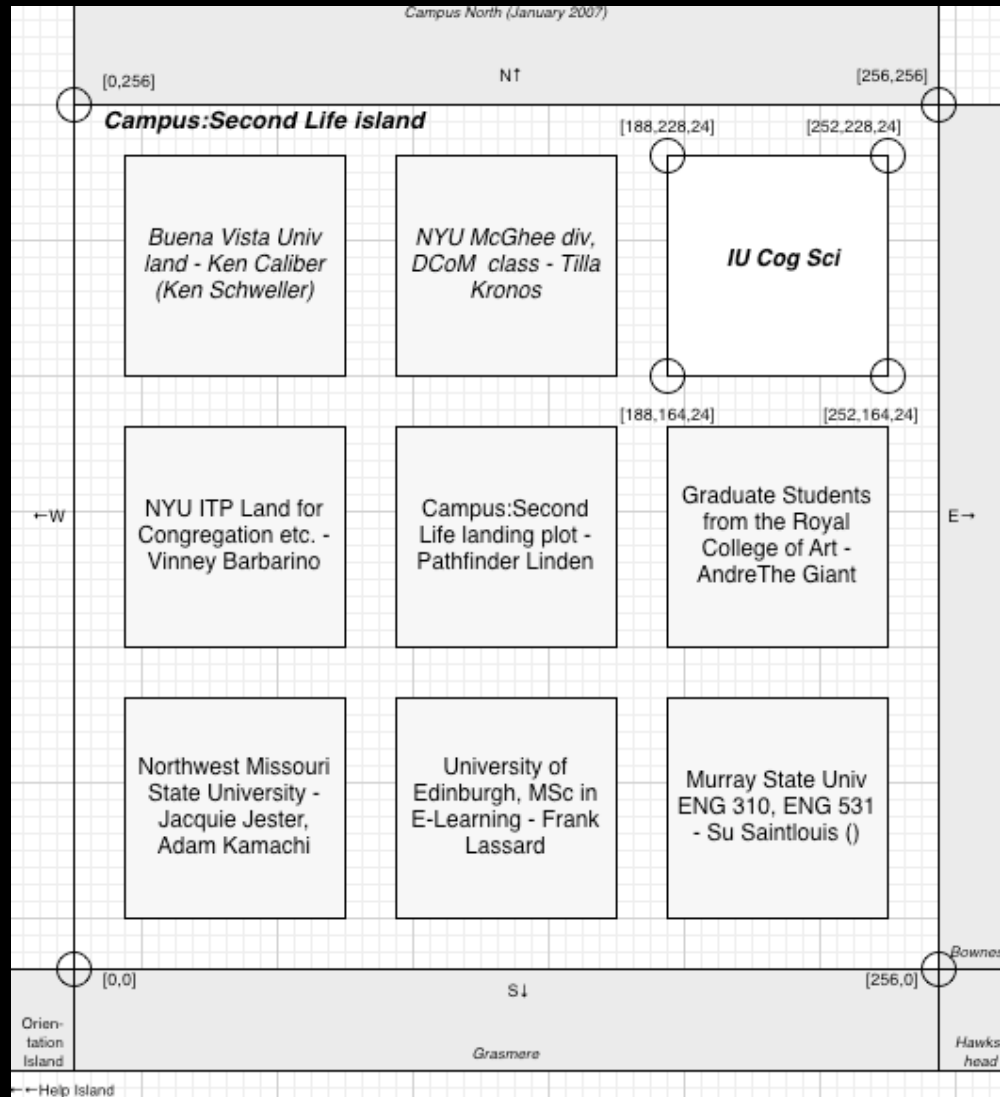
- UC Davis: simulating hallucinatory experience
 - ◆ training for medical students, hospital staff
 - ◆ based on interviews with patients
 - ★ <http://www.ucdmc.ucdavis.edu/psychiatry/research/virtual.html>
 - ★ <http://www.ucdmc.ucdavis.edu/ais/virtualhallucinations/>

research done in Second Life

- LIFE Center's *Terra Vita*
 - ◆ <http://life-slc.org/>



courses on Campus: Second Life island



academic activity in Second Life

- Central Missouri State University, "CyberCulture" (exploring the socio-cultural experiences and implications of cyberspace)
- University of Massachusetts, Dartmouth, "Virtual Reality Design"
- Larsson Lindstrand Palme Arkitektkontor, Stockholm, Sweden, "Production of Architecture"
- Minneapolis College of Art and Design, "The Human Animal" (studying issues of anthropomorphism)
- Stanford University, "Critical Studies in New Media"
- College of St. Scholastica, Duluth, Minnesota, "The Responsible Self - Dignity in the Online World"
- Teachers College at Columbia University, "Virtual Worlds"
- Johnson & Wales University, Providence, Rhode Island, "Process and Quality Management" (educational business models)
- University of Derby, United Kingdom, "Game Design"
- University of Wales, Newport, UK, "3D Computer Graphics and Virtual Worlds"
- Case Western Reserve University, Cleveland, Ohio, "Theater and Culture"
- University of Illinois, College of Education, "Cognitive Science in Teaching and Learning"
- Arcada Polytechnic, Helsinki, Finland, "Cultural Exchange and Government"
- Graduate School of Education and Psychology, Pepperdine University, Malibu, California, "Instruction in Educational Technology"
- Hamilton College, Clinton, NY, "Cultural Simulation Seminar" (simulating space exploration and colonization)
- Institute of Rural Health, Idaho State University, Pocatello, "Collaborative Training for Healthcare Professionals"
- Montgomery College, Maryland, "Game and Simulation Training"
- University of Derby, United Kingdom, "Teaching Abilities of Virtual Environments"
- Film & Media Studies, University of Oregon, "New Media & Digital Culture"

more courses taught in Second Life



- Ohio State: Second Life Learning Community
 - ◆ <http://www.library.ohiou.edu/sllc/>
- Ball State: English composition classes
 - ◆ <http://www.secondlife.intellagirl.com/>

more related activities in SL

- Ecosystem Working Group

- ◆ http://www.magnificentwreckage.com/wiki/index.php?title=Developer_Resources



education and research in SL:

- lots of amateur user-to-user education in SL
- on the high-end side:
 - ◆ an alternative to Access Grid?
Beyond Broadcast 2006:
conference simultaneously
in RL and SL




problems

- grievers
- goo
- copybot
- landbots...

boingboing
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THURSDAY, DECEMBER 21, 2006

Second Life grievers assault real estate millionaire Anshe Chung



A bunch of grievers in Second Life staged a members-only metaverse assault on "virtual real estate tycoon" [Anshe Chung](#) yesterday, during a staged SL event with CNET reporter Daniel Terdiman. A torrent of pixelated male genitals rained upon the victim, whose offline name is Ailin Graef.

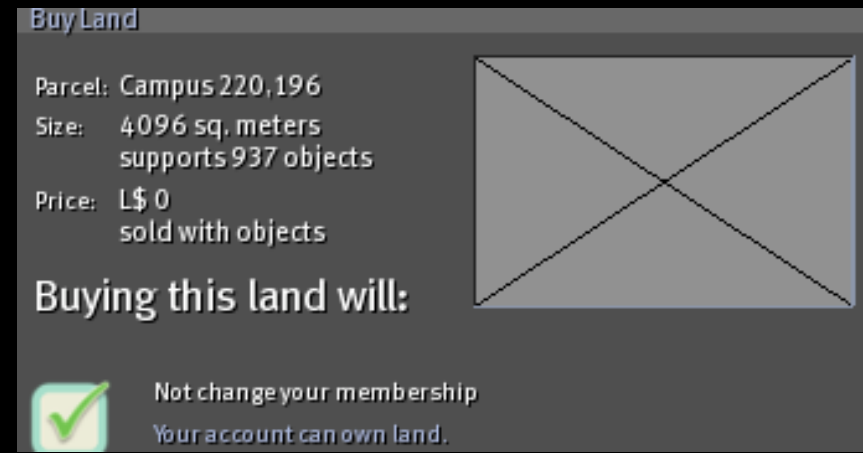
trivia and curiosities

- games
 - ◆ gambling
 - ◆ virtual sailing (works better than faster vehicles...)
- Tringo (tetris-bingo?) a game which
 - ◆ started in SL
 - ◆ was licensed and ported to
- the Corn Field
 - ◆ 2007.02.06: *"Unfortunately, the Corn Field has been disabled and is no longer active in Second Life, as the size of the community made this irrelevant."*



porting current IU CogSci experiments to SL

- Campus: Second Life
 - ◆ land for IU CogSci Q400, Spring 2007



- starting points:
 - ◆ <http://groups.psych.indiana.edu/>
 - ◆ <http://sourceforge.net/projects/gabel/>

porting current IU CogSci experiments to SL



- Campus: Second Life island

existing Virtual World projects at IU

- SWI, Arden - Multiverse based - Ted Castronova, MIME
 - ◆ <http://swi.indiana.edu/>
 - ◆ <http://www.multiverse.net/>
- iUni - ActiveWorld based - Katy Börner, SLIS
 - ◆ <http://vw.indiana.edu/>
 - ◆ <http://www.activeworlds.com/>

references

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Cory Ondrejka, Design Computing Cognition 2004
<http://wwwfaculty.arch.usyd.edu.au/kcdc/conferences/dcc04/workshops/workshopnotes7.pdf>
- [2] - Linden Scripting Language wiki:
<http://rpgstats.com/wiki/index.php?title=LSL101Chapter1>
- [3] - Campus: Second Life program:
http://www.simteach.com/wiki/index.php?title=Campus:Second_Life
- [4] - *User Creation and Scripting in Second Life*, Cory Ondrejka
and James Purbrick, Lang.NET Symposium 2006
- [5] - *SL Virtual Economy Metrics*, Linden Labs 2007.02.02
- [6] - *Havok 2*, Andrew Meadows, SL Developer's Journal
2003.10.23

slide-by-slide detailed references

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13. more Havok references in [6]
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27. picture excerpt from Beyond Broadcast 2006 <http://www.beyondbroadcast.net/> Retrieved on 2007.02.13
28. quotes from boingboing.net 2006.12.21
29. picture excerpt from GamingBlog <http://www.gamingblog.org/entry/hidden-virtual-world-prison-revealed/>. Retrieved 2007.02.07.

for more information

- mitja@indiana.edu
 - ◆ in-world as Mitja Omlet (yeah, alright)
- IU CogSci Q400 space on Campus island for Spring 2007:
 - ◆ <http://slurl.com/secondlife/Campus/198/174/30/>

end of *How I Learned to Stop Worrying and Love LSL* (part 1, *hic sunt leones*) - to be continued...