eTwinning 2017 Thematic Conference

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Divani Caravel Hotel, Athens Greece

Using OpenSim to Construct a 3D World

ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ
UNIVERSITY OF PATRAS

OpenSim

- **OpenSimulator** is an open source multi-platform, multi-user 3D application server. It can be used to create a virtual environment (or world) which can be accessed through a variety of clients, on multiple protocols.
  http://opensimulator.org/wiki/Download

- **Diva Distro**: Preconfigured hypergrided standalone. This version has already configured many parameters and can save you some time.
  http://metaverseink.com/Downloads.html

OpenSim

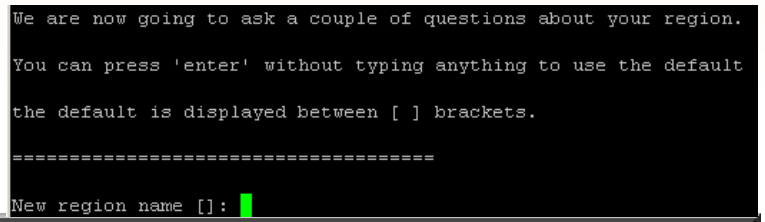
- OpenSimulator can be used to simulate virtual environments similar to Second Life
- Secondlife and OpenSim have been widely used in Education

Server Installation

- Just Download OpenSim (or Diva) and extract in a folder (no installation required).
- Run ‘OpenSim.exe’ in ‘bin’ folder. For Linux you have to use ‘mono’ to run it.

```
sudo mono bin/OpenSim.exe
```

- The first time you run it, it will guide you to configure some parameters.



Initial Configuration

- Initial Region of the World (you can create more later)
  - Region Name
  - UUID
  - Location [X,Y]
  - Internal IP address
  - Internal Port LAN: SYSTEMIP (default)
    ONLINE: Use System's external IP

Initial Configuration

- Estate
  - Name
  - Owner (firstname, lastname)

Configuration

- **[GridInfoService]**

  Open file:
  /bin/config-include/StandaloneCommon.ini

  login=IP

OpenSim Console

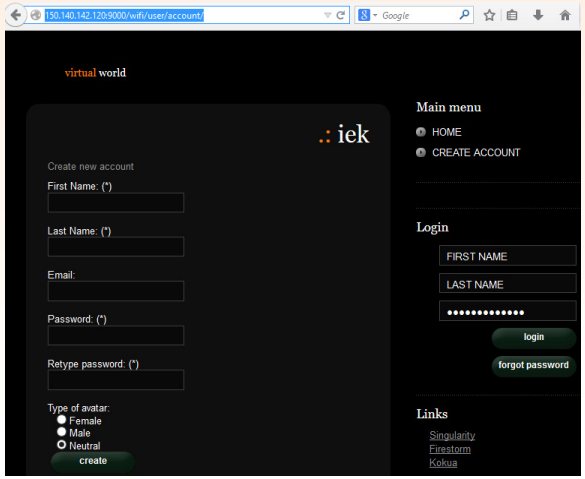
- quit
- create user
- create region [[region name]]
- change region [[region name]]

- terrain load

- load oar [[filename]]
- save oar [[filename]]
- load iar [[first]] [[last]] [[path]] [[password]]
- save iar [[first]] [[last]] [[path]] [[password]]

Account Management

- Interfaces available
  - Wifi
    http://opensimulator.org/wiki/Wifi



OpenSim Viewers

Singularity

http://www.singularityviewer.org/downloads

Kokua

http://wiki.kokuaviewer.org/wiki/Kokua/Downloads#OpenSim_Grids

Firestorm

http://www.firestormviewer.org/downloads/

Moving

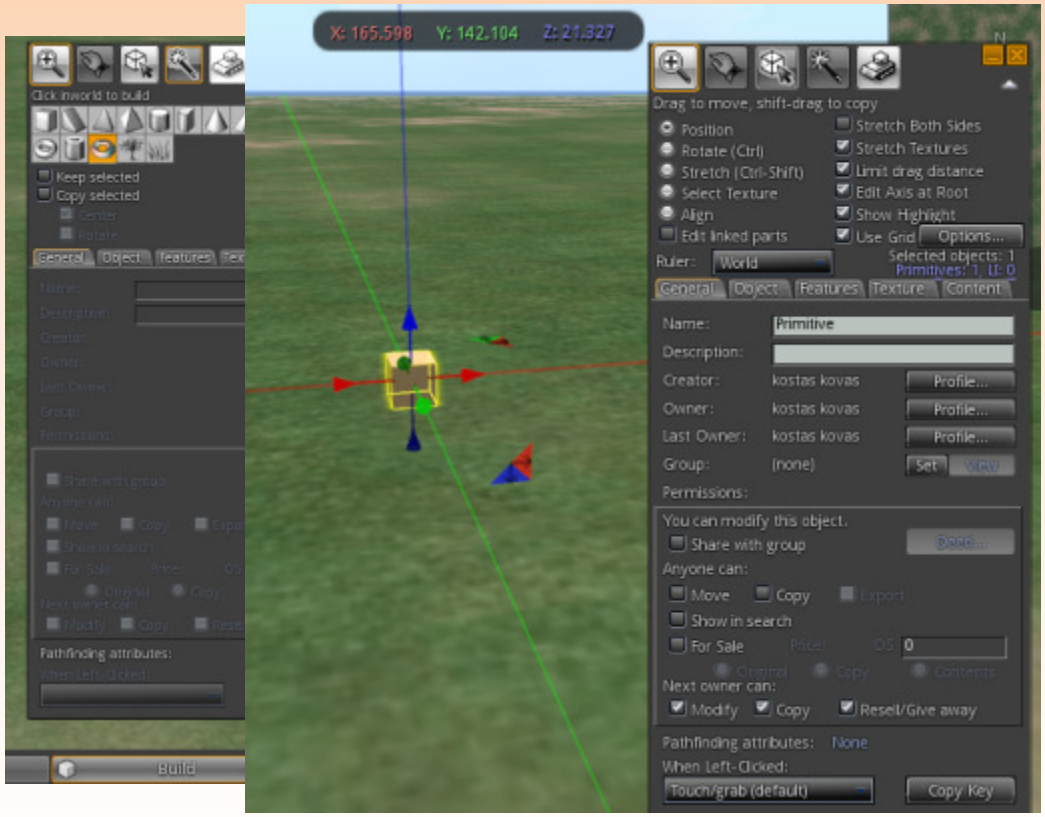
- Avatar -> Preferences -> Move & View -> Movement
  - Enable: ‘Pressing letter keys affects movement (i.e. WASD)
  - Single / Double click on land

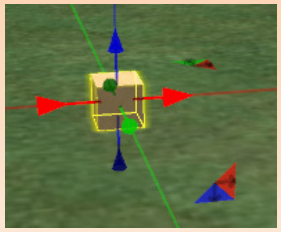
Key	Motion	Equivalent
W	Forward	Up Arrow
A	Turn Left	Left Arrow
Shift-A	Strafe Left	Shift-Left Arrow
S	Backward	Down arrow
D	Turn Right	Right Arrow
Shift-D	Strafe Right	Shift-Right arrow
E	Jump	PgUp
C	Crouch	PgDn
F	Fly	Home

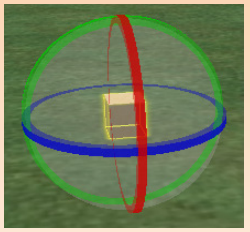
Camera

Key/Mouse Combination	Function
Alt-Left Click	Zoom: You can control the degree of zoom by left clicking the spot, then moving your mouse forward or back. Side-side motion on the mouse will rotate the camera round the selected spot.
Ctrl-Left-Click	Orbit: Rotates the camera around the selected spot on screen.
Shift-Ctrl-Left-Click	Pan: Move the camera laterally or front-back, but without zooming or rotating.
Shift-Ctrl-Alt-Left click	Pan: move the camera up or down.

Prims

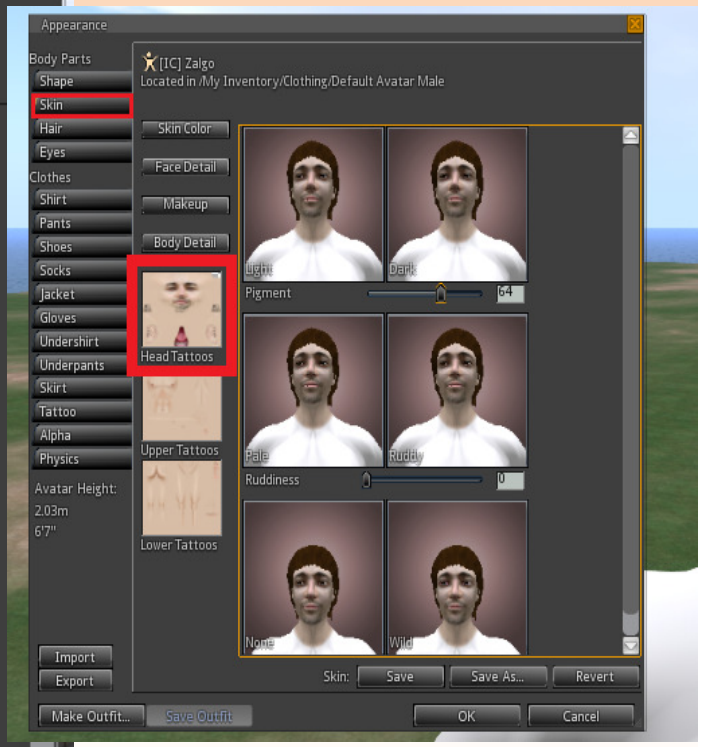




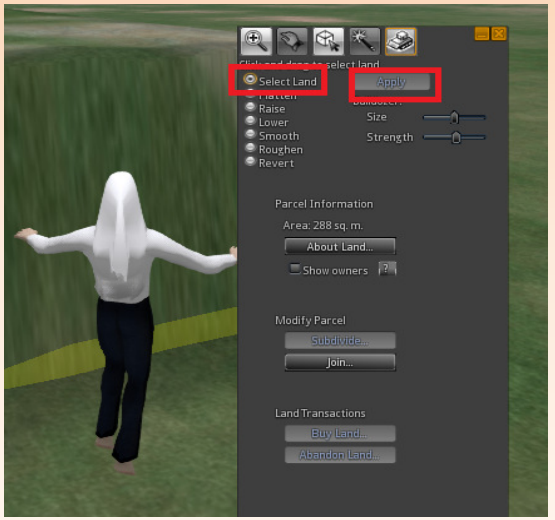


- **General** (info, name, owener)
- **Object** (Position, Rotation, Size)
- **Features** (Flexible Path , Light)
- **Texture** (Surface)
- **Content** (Inventory, Scripts)

Avatar Appearance

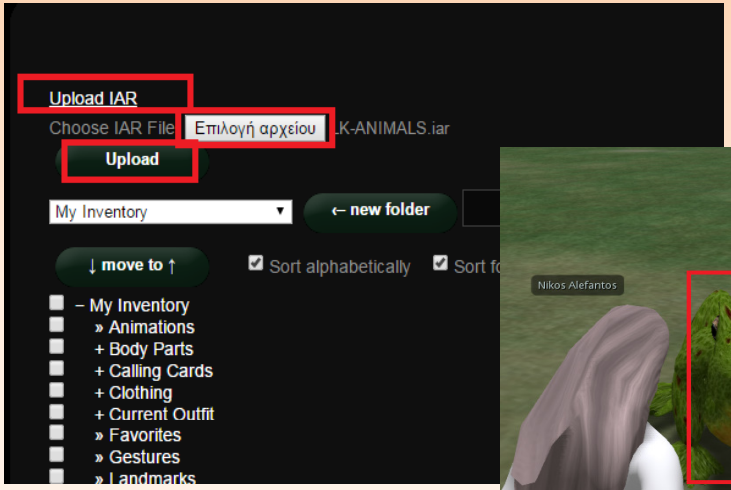


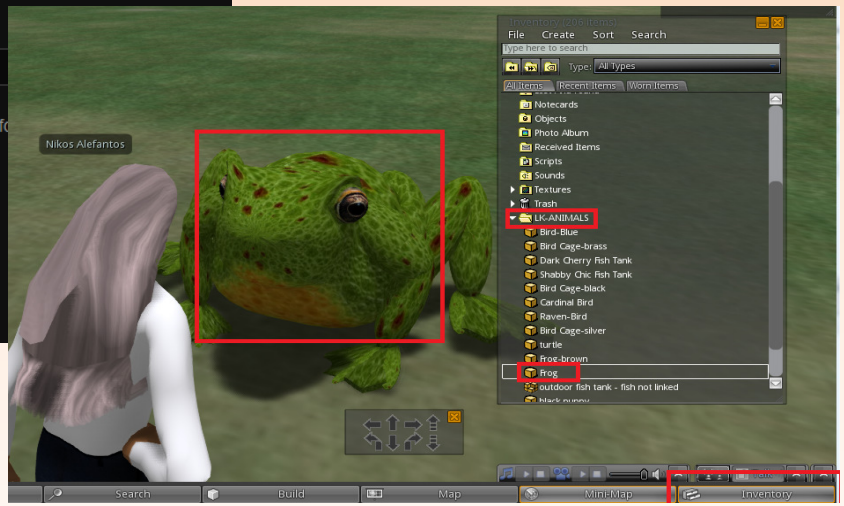
Terrain



L3DT can create ".raw" terrain files
http://www.bundysoft.com/L3DT/downloads/standard.php

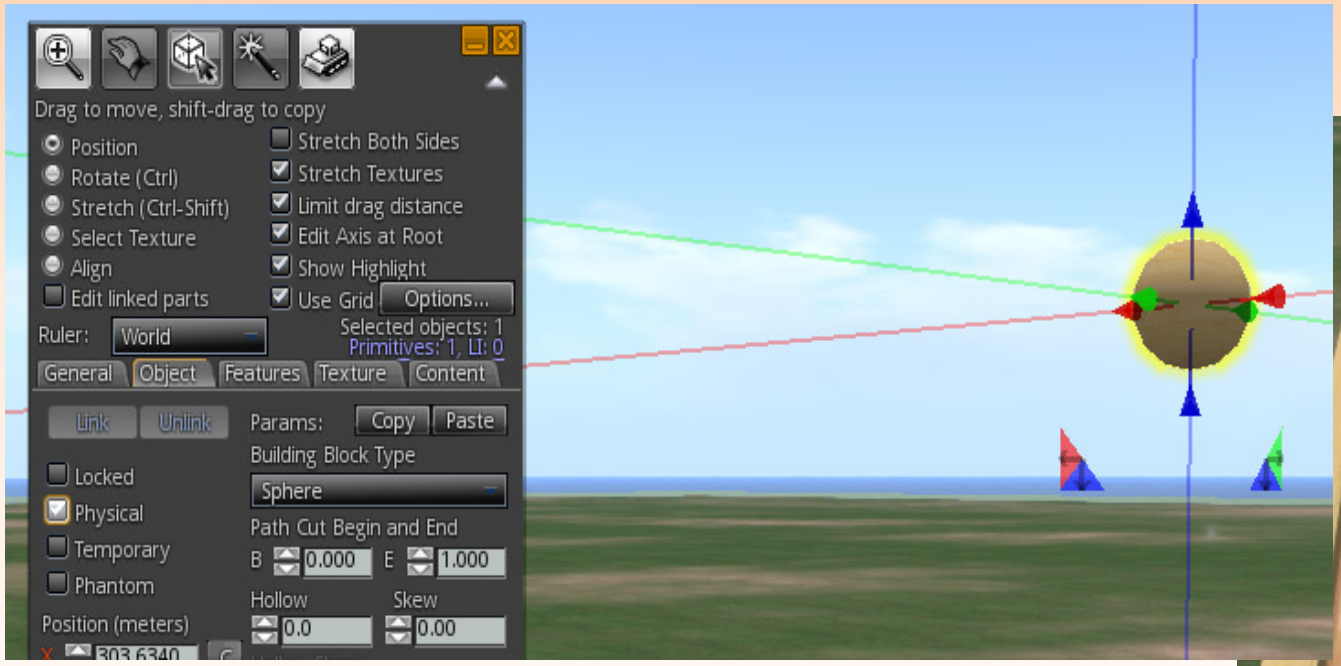
IAR Item Collections

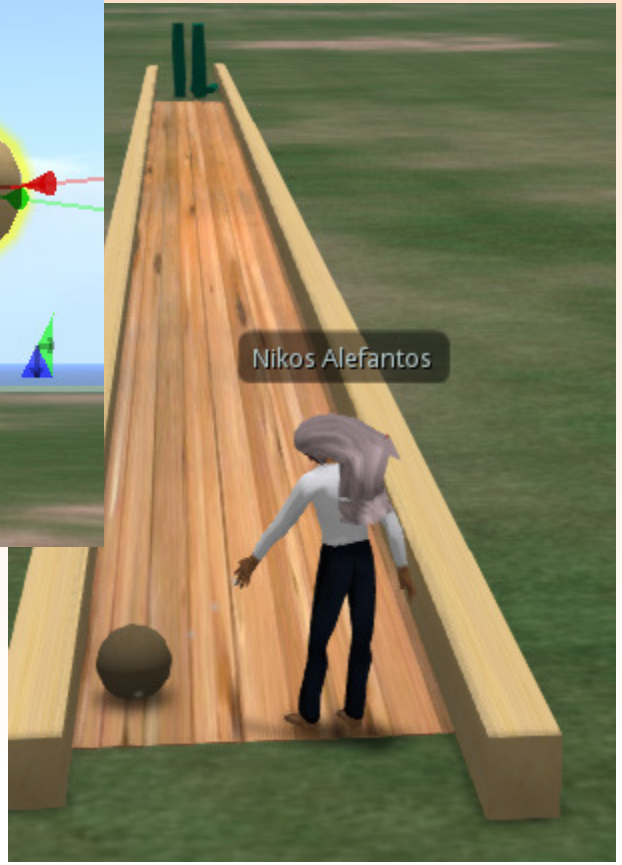




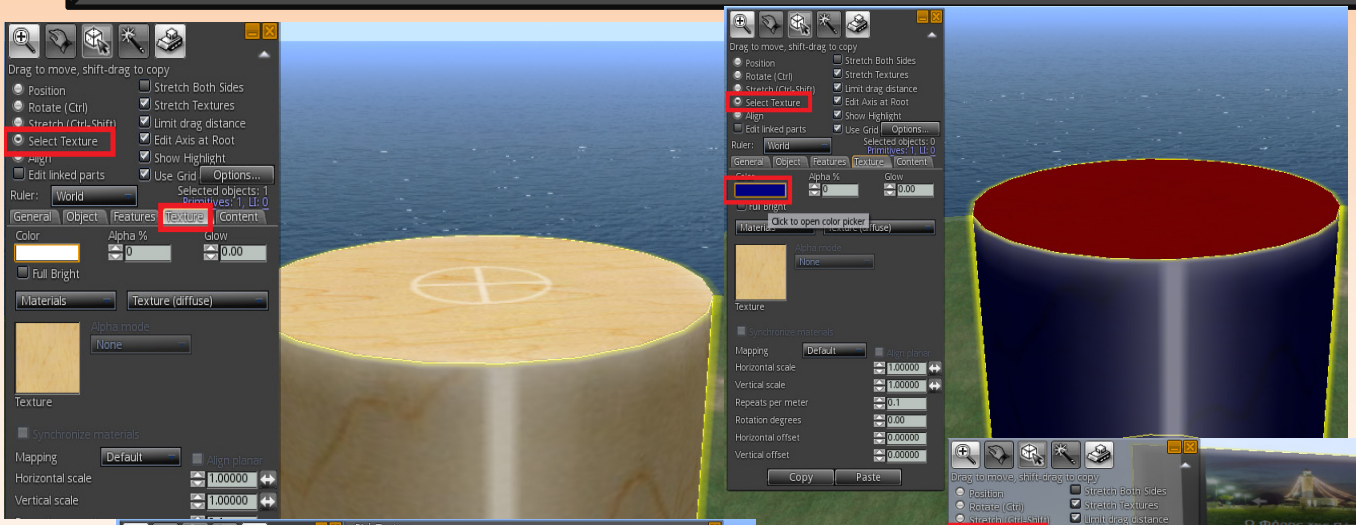
http://zadaroo.com/?page_id=1584

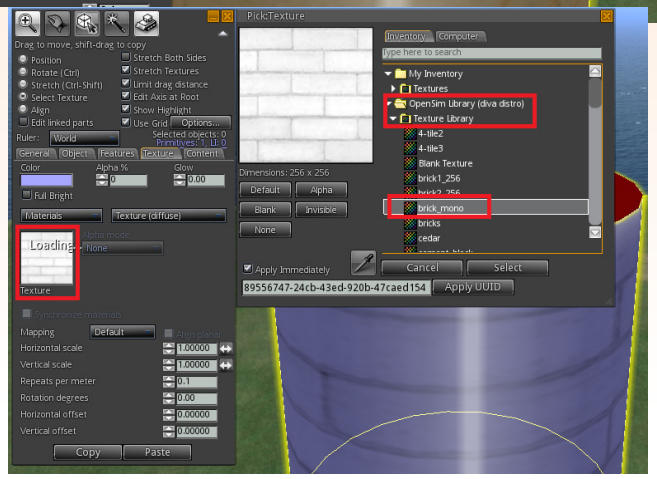
Physics Engine

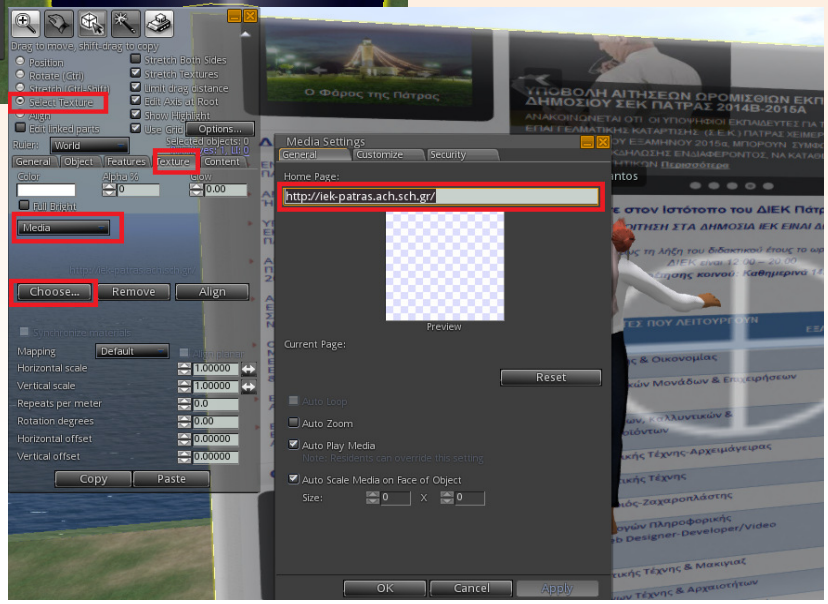




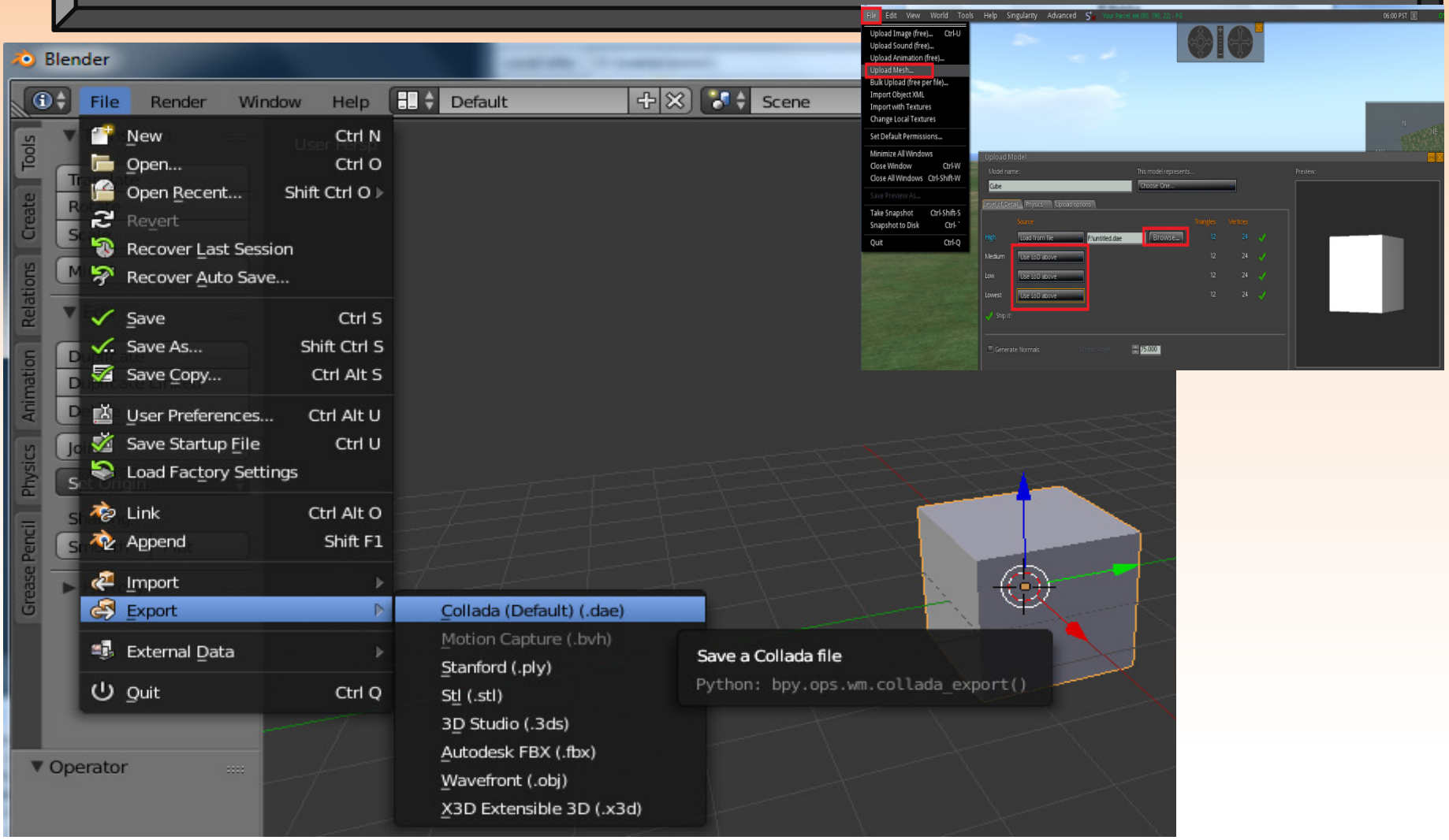
Textures


Drag to move, shift-drag to copy
Position
Rotate (Ctrl)
Stretch (Ctrl-Shift)
Select Texture
Align
Edit linked parts
Stretch Both Sides
Stretch Textures
Limit drag distance
Edit Axis at Root
Show Highlight
Use Grid
Options...
Ruler:
World
Selected objects: 1
Primitives: 1, LI: 0
General
Object
Features
Texture
Content
Color
Alpha %
Glow
Full Bright
Materials
Texture (diffuse)
Alpha mode
None
Texture
Synchronize materials
Mapping
Default
Align planar
Horizontal scale
Vertical scale
1.00000
Repeats per meter
Rotation degrees
Horizontal offset
Vertical offset
0.00000
Copy
Paste

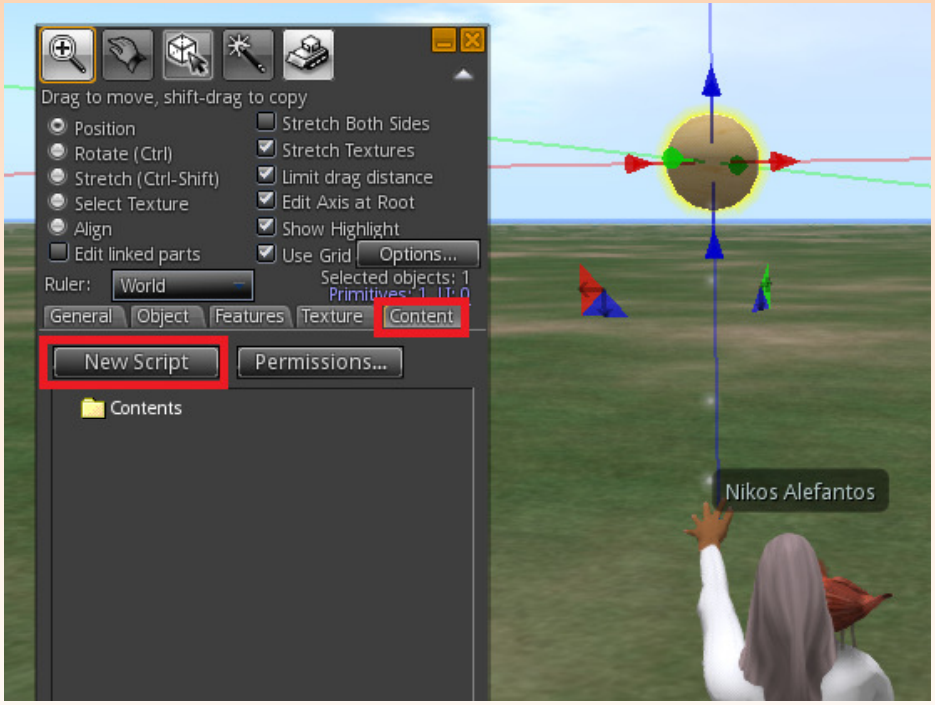

PickTexture
Inventory
Computer
Type here to search
My Inventory
Textures
OpenSim Library (diva distro)
Texture Library
4-tile2
4-tile3
Blank Texture
brick1_256
brick_mono
bricks
cedar
Dimensions: 256 x 256
Default
Alpha
Blank
Invisible
None
Apply Immediately
Cancel
Select
89556747-24cb-43ed-920b-47caed154
Apply UUID
Loading...
Texture
Copy
Paste

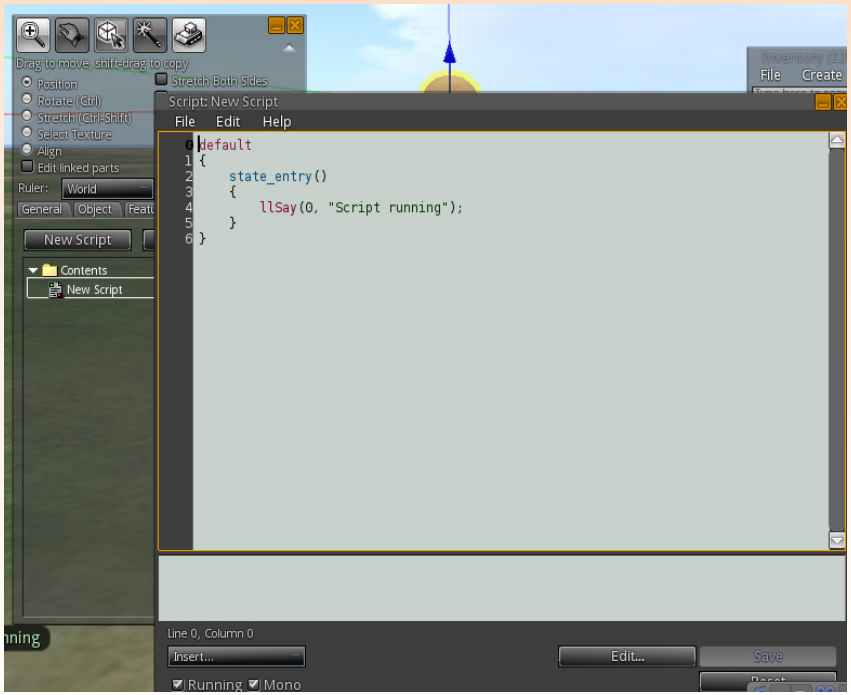

Media Settings
General
Customize
Security
Home Page:
http://iek-patras.ach.sch.gr/
Media
Choose...
Remove
Align
Preview
Current Page:
Reset
Auto Loop
Auto Zoom
Auto Play Media
Auto Scale Media on Face of Object
Size:
OK
Cancel
Apply

3D Modeling


Blender
File
Render
Window
Help
Default
Scene
New Ctrl N
Open... Ctrl O
Open Recent... Shift Ctrl O
Revert
Recover Last Session
Recover Auto Save...
Save Ctrl S
Save As... Shift Ctrl S
Save Copy... Ctrl Alt S
User Preferences... Ctrl Alt U
Save Startup File Ctrl U
Load Factory Settings
Link Ctrl Alt O
Append Shift F1
Import
Export
External Data
Quit Ctrl Q
Collada (Default) (.dae)
Motion Capture (.bvh)
Stanford (.ply)
Stl (.stl)
3D Studio (.3ds)
Autodesk FBX (.fbx)
Wavefront (.obj)
X3D Extensible 3D (.x3d)
Save a Collada file
Python: bpy.ops.wm.collada_export()
Operator
Tools
Create
Relations
Animation
Physics
Grease Pencil

Scripting


Drag to move, shift-drag to copy
Position
Rotate (Ctrl)
Stretch (Ctrl-Shift)
Select Texture
Align
Edit linked parts
Stretch Both Sides
Stretch Textures
Limit drag distance
Edit Axis at Root
Show Highlight
Use Grid
Options...
Ruler:
World
Selected objects: 1
General
Object
Features
Texture
Content
New Script
Permissions...
Contents
Nikos Alefantos


Script: New Script
File
Edit
Help
default
{
state_entry()
{
llSay(0, "Script running");
}
}
Line 0, Column 0
Insert...
Edit...
Save
Running
Mono

Scripting

```
default //default state is mandatory{
   state_entry() // runs each time the state is entered    {
      llSay(0, "turning on!"); //object speaks!
      llSetColor(<1.0, 1.0, 1.0>, ALL_SIDES);
      // sets no tint (white)
      // note the semicolons at the end of each instruction
    }
    touch_end(integer total_number)       {
      state off;
     }
}


state off // a second state besides "default"{
     state_entry()    {
         llSay(0, "turning off!");
         llSetColor(<0.0, 0.0, 0.0>, ALL_SIDES); // sets black
     }
    touch_end(integer total_number)    {
          state default;
     }
}
```

Scripting

- `llWhisper(0,"turning on!");`
- `llSetText("I am on", <1.0, 1.0, 1.0>,1.0);`
- `llTargetOmega(<0,1,0>, -0.9, 2);`
- `llTriggerSound("water-flowing3", 0.8);`
- `llSetTextureAnim(ANIM_ON | SMOOTH | LOOP , ALL_SIDES, 1, 1, 1.0, 0.0, rate);`
- `llSleep(1.5);`
- `llSetTexture(texture, 3);`

Special Scripts

- Vehicle Script
- Weapon Script
- Particle Script

NPC Characters

- bin/opensim.ini
  NPC Enable

- Config-include/osslEnable.ini
  Threat level: Severe