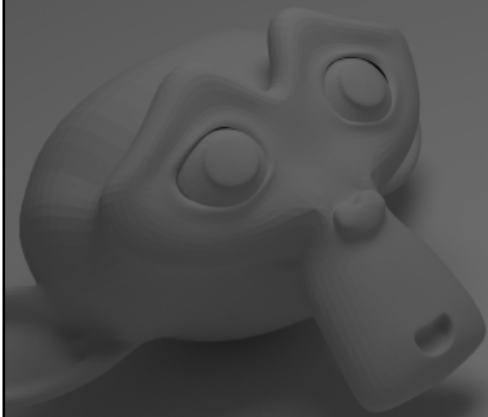


BlenderVR

Framework for multiplatform interactive Virtual Reality



D. Poirier-Quinot, D. Felinto, B. Katz

I. Software Overview

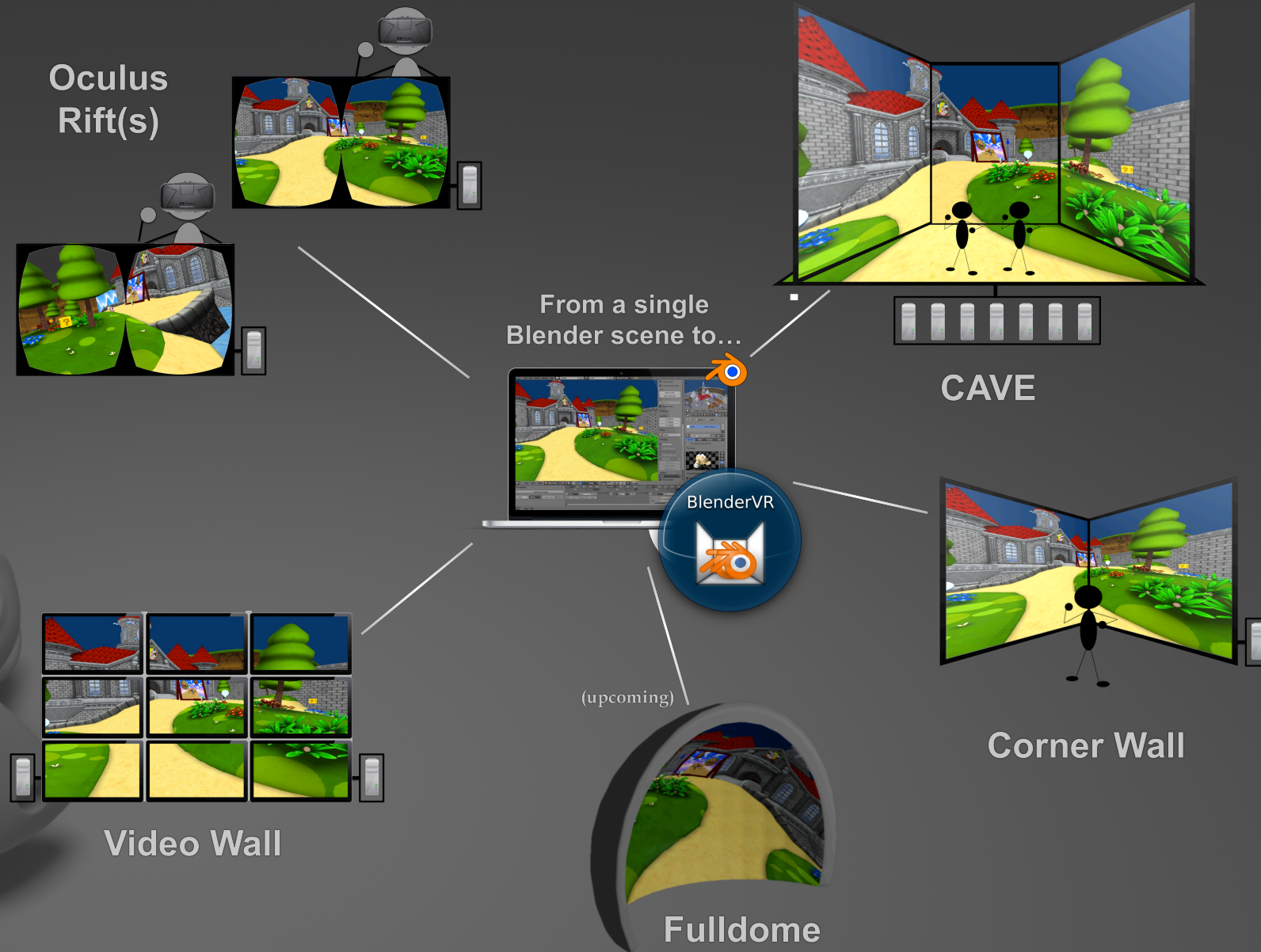
Objective

Operating

II. Current state of the Project

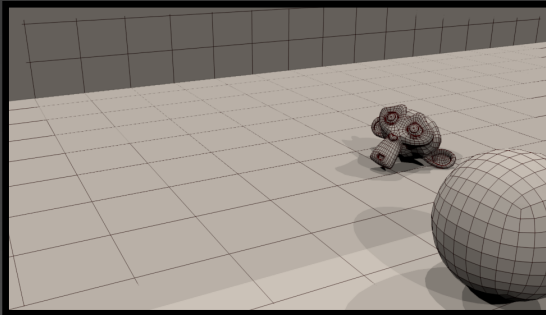


Objective: One to rule them all



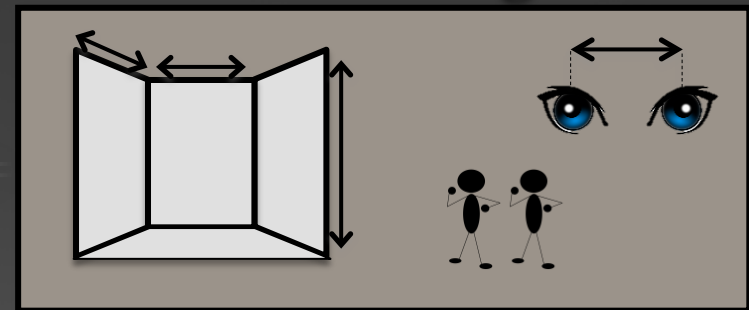
Operating: VR Recipe

Blender scene



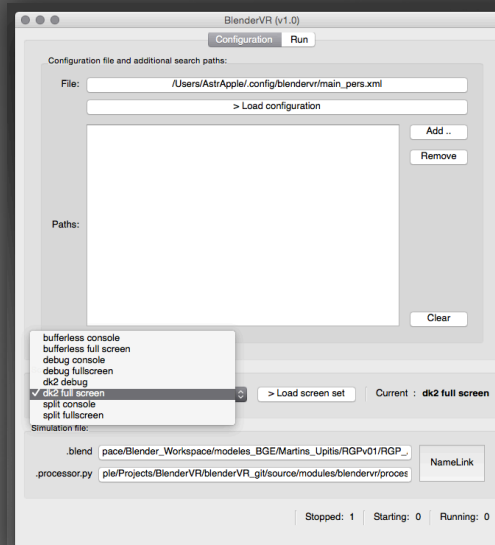
3D objects, game logic

Architecture configuration



Define screens, nodes, users, etc.

BlenderVR GUI



VR scene

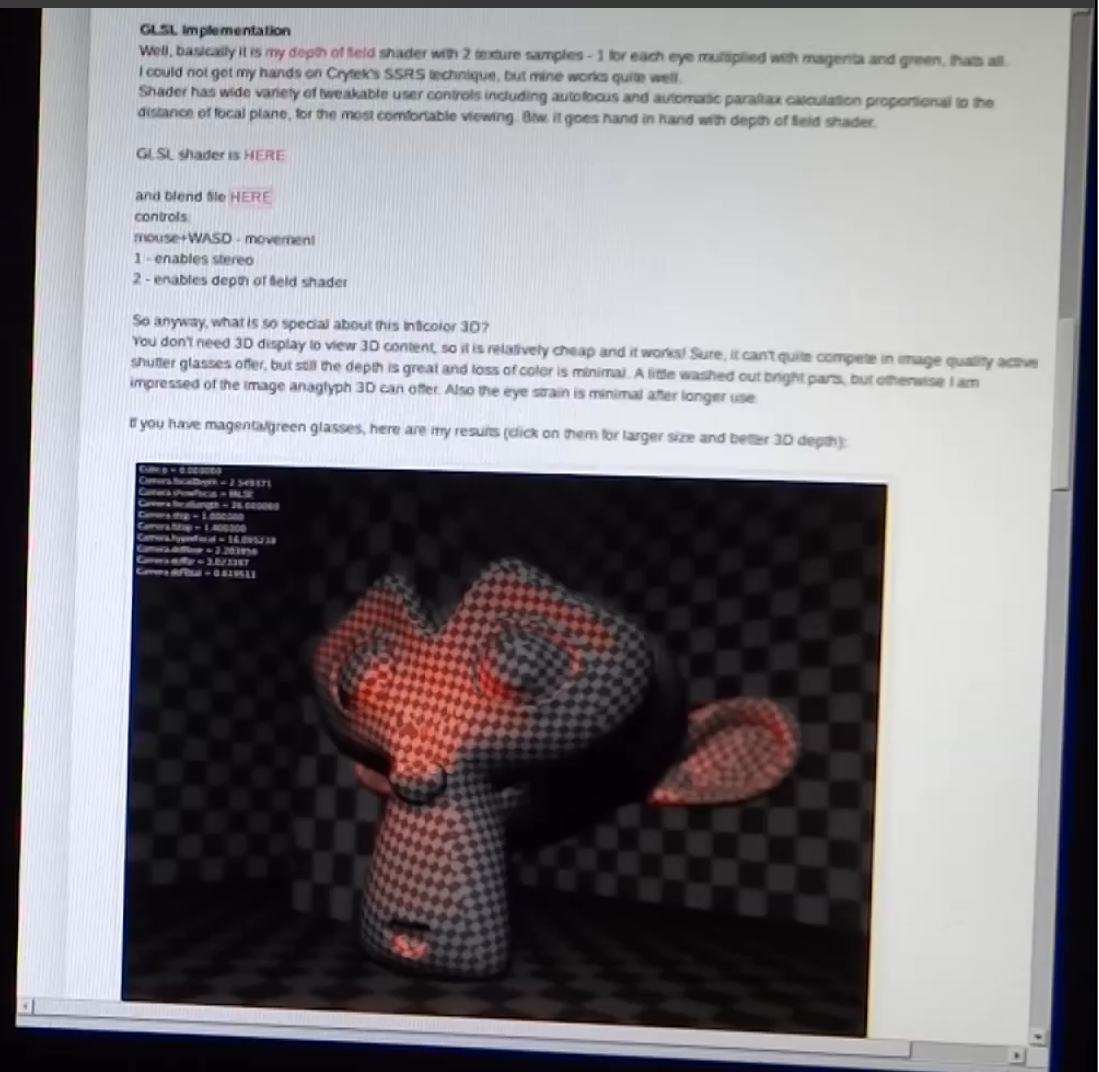
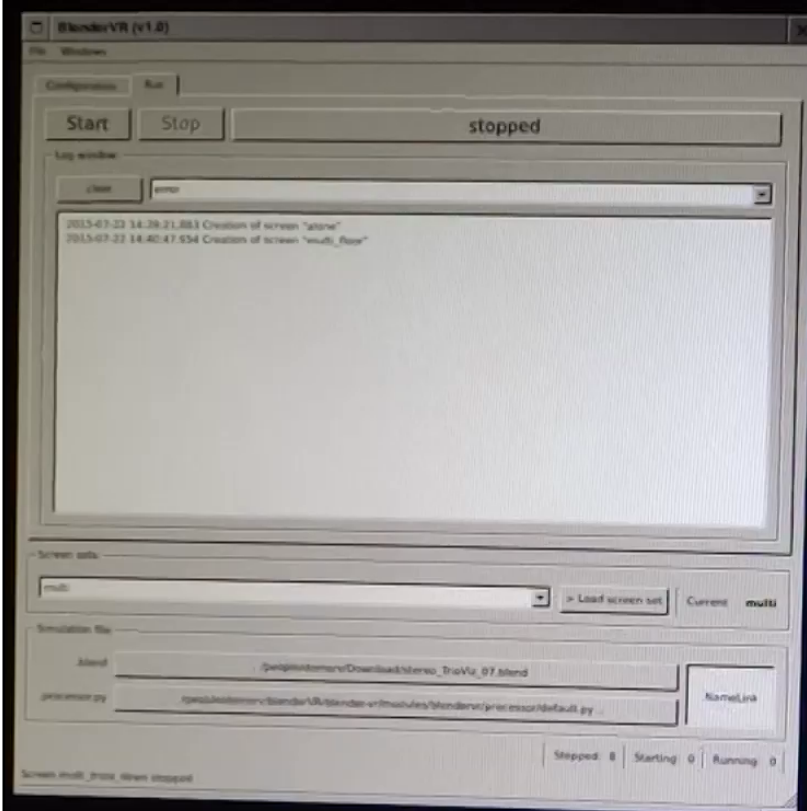
Select scene, configuration, start run

Operating: Plug & Play, CAVE scenario

directly render any Blender scene to your VR architecture

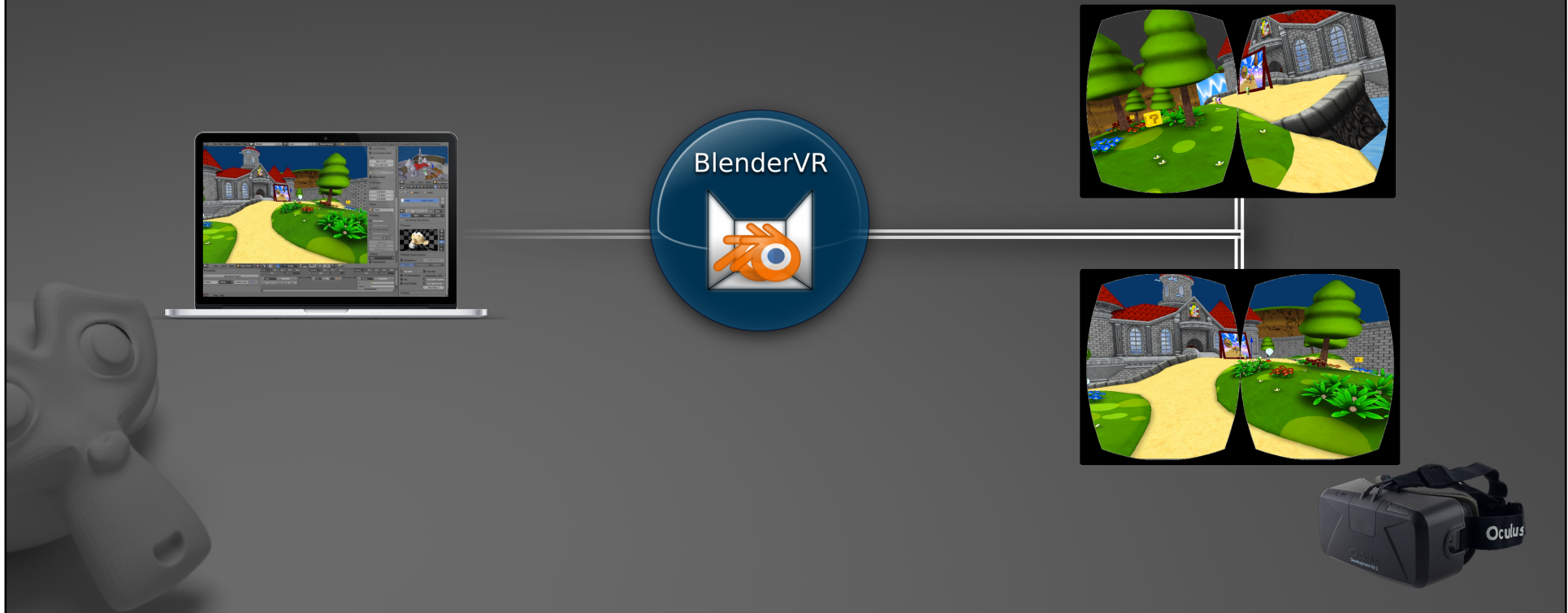


Operating: Plug & Play, CAVE scenario

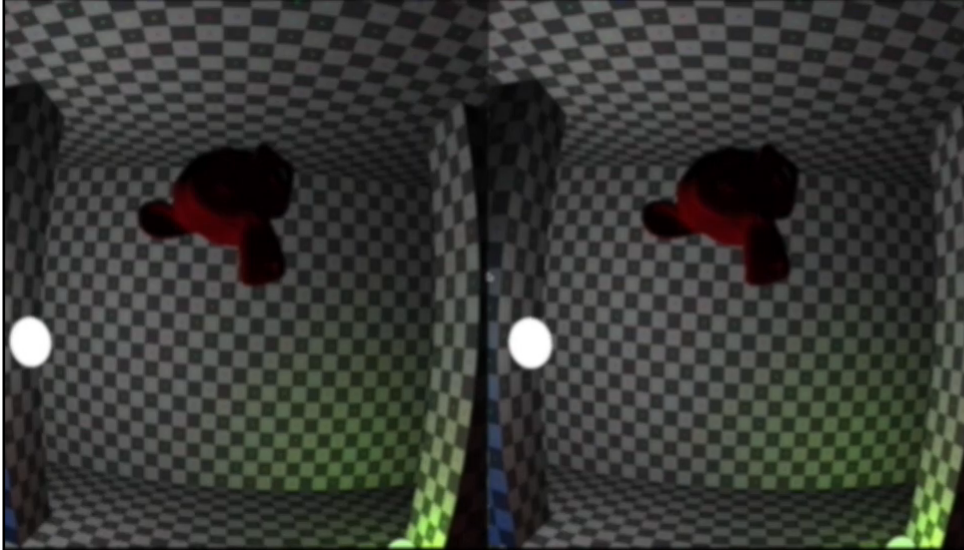


Operating: Oculus rift, 2 users interaction

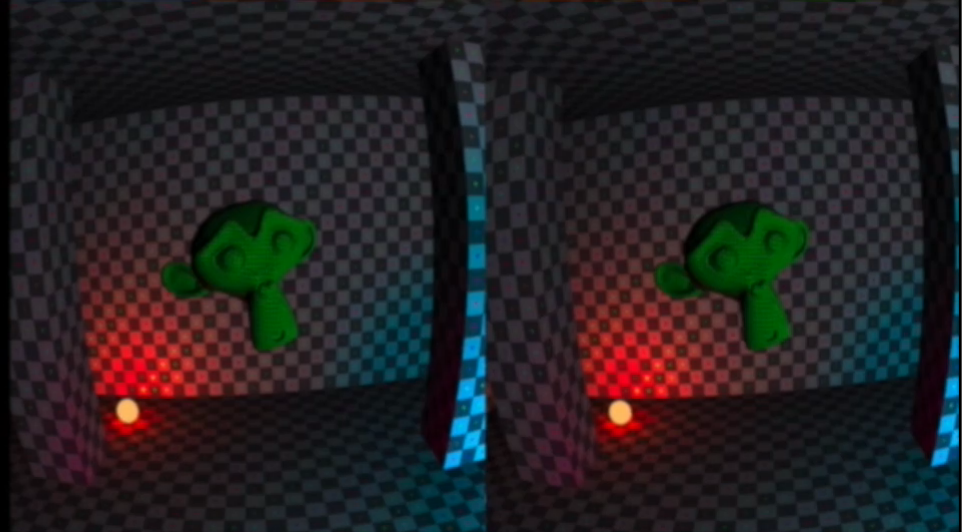
networked interactions



Operating: Oculus rift, 2 users interaction



**HMD multi-users (dk2)
(both users navigate and
interact in the same scene)**

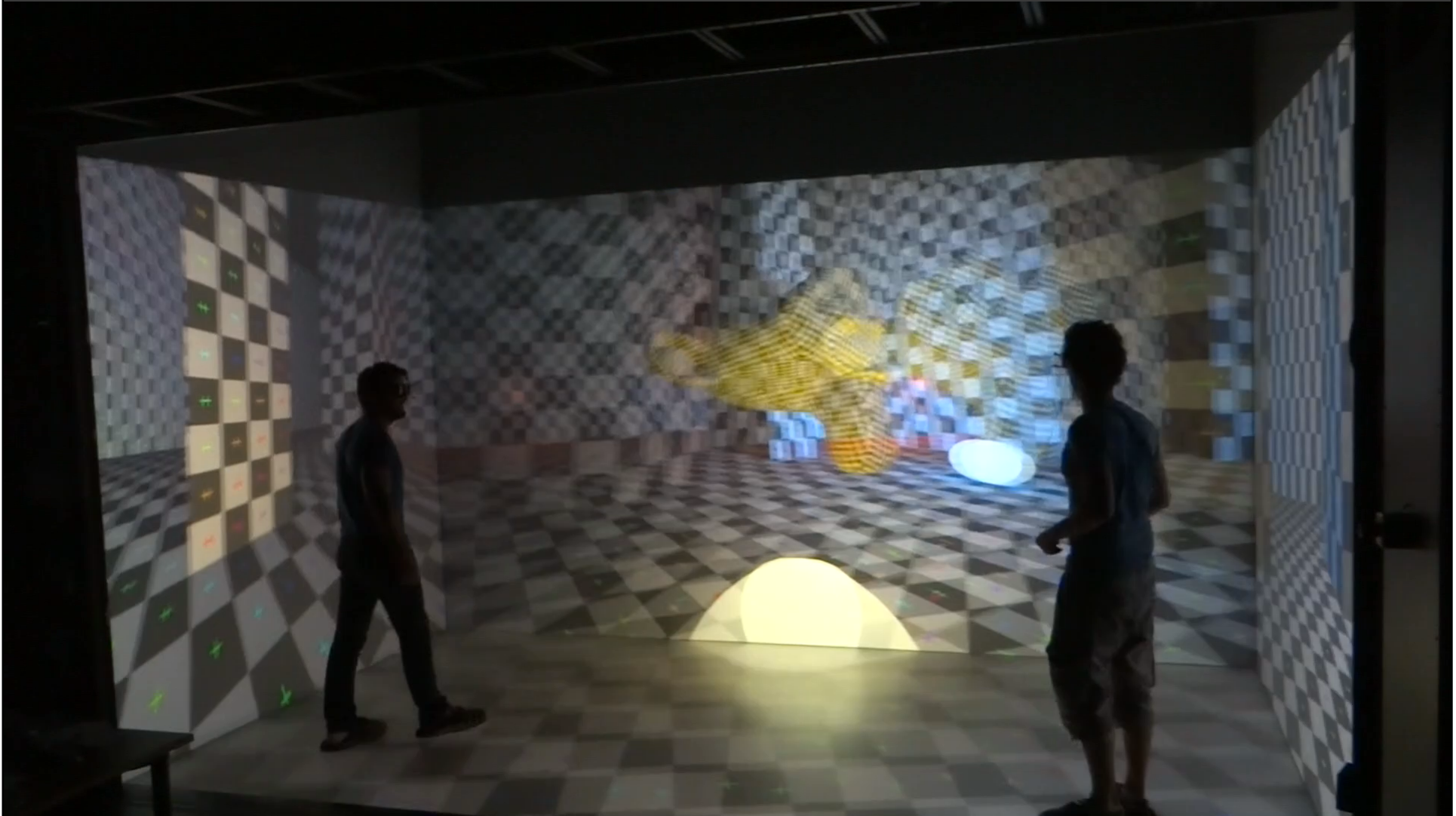


Operating: CAVE, multi-users stereoscopy

multi-users adaptive stereoscopic rendering



Operating: CAVE, multi-users stereoscopy

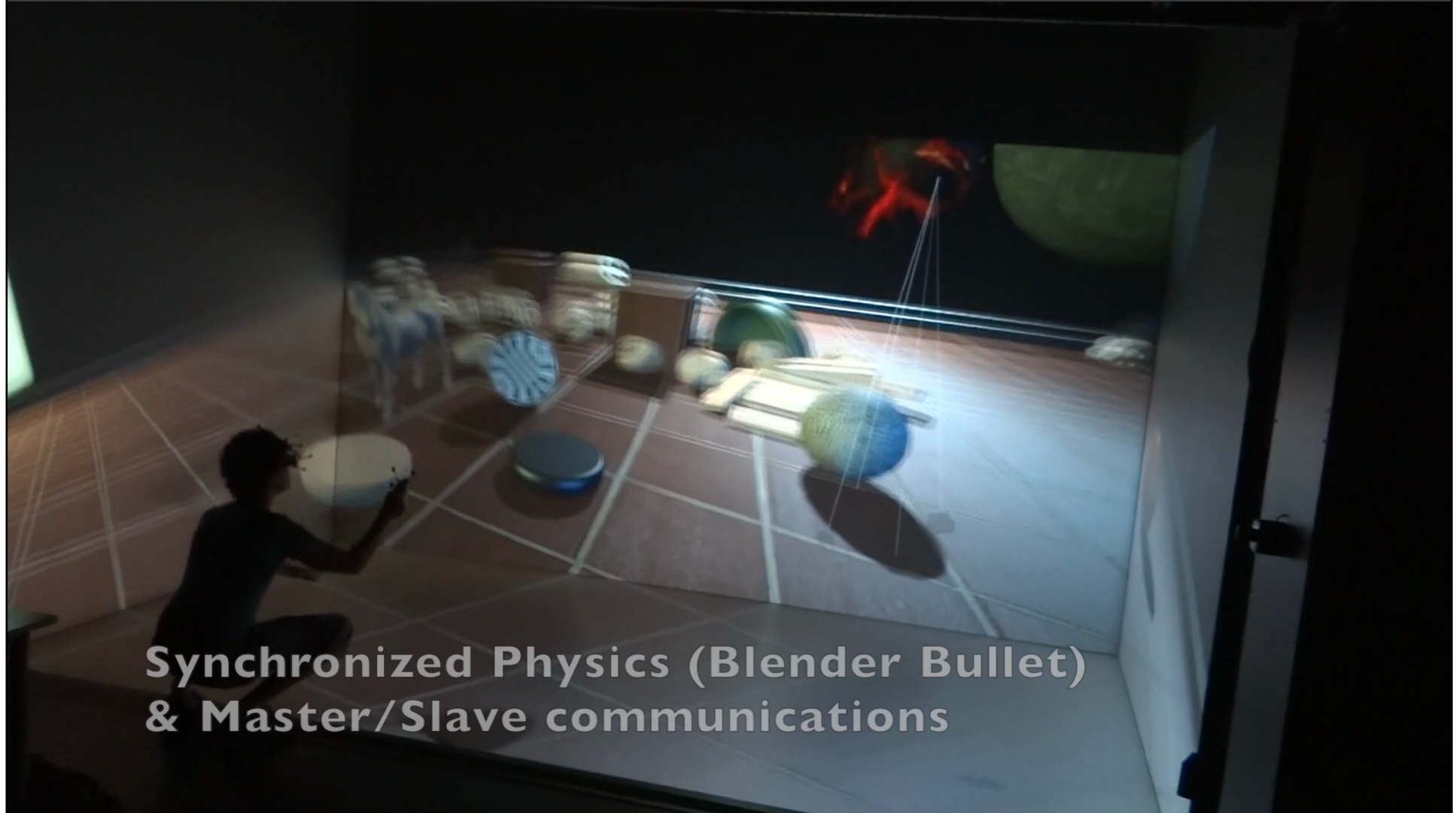


Operating: CAVE, master/slave synchronization

compliant with bullet physics, animations, armatures, etc.



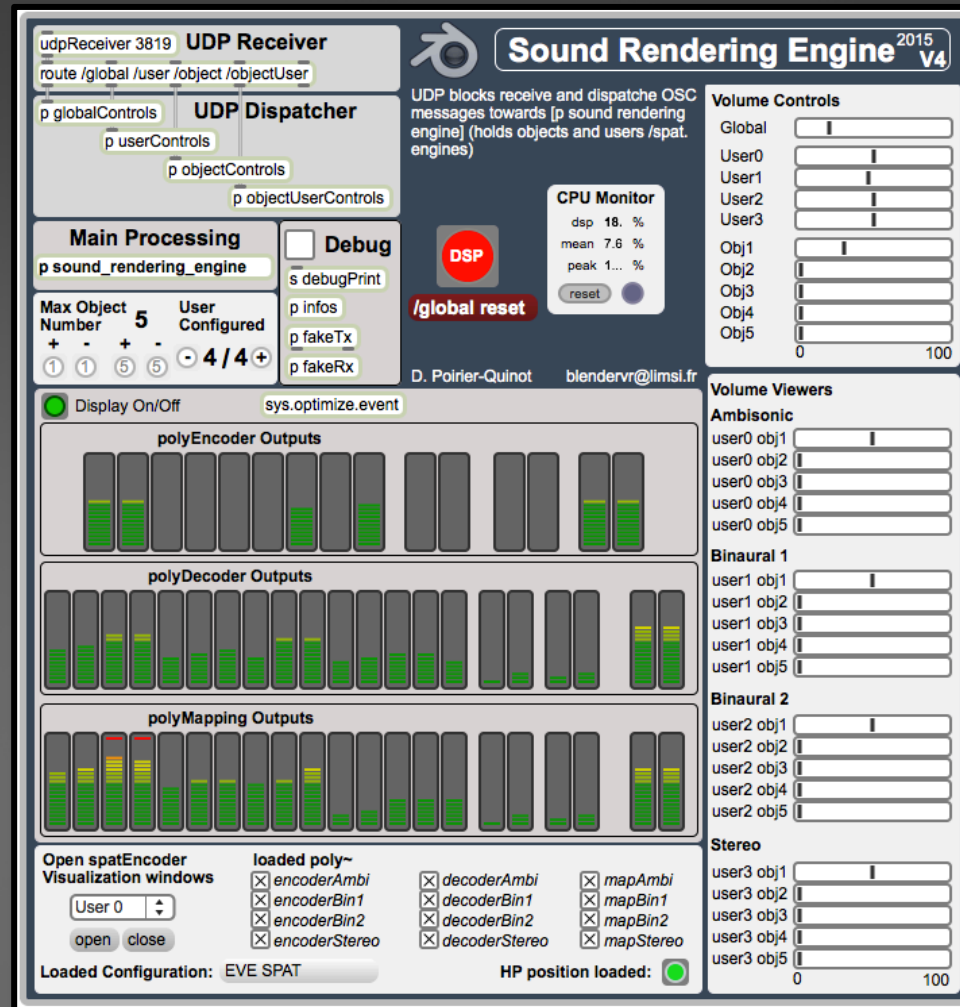
Operating: CAVE, multi-users stereoscopy



**Synchronized Physics (Blender Bullet)
& Master/Slave communications**

Operating: 3D sound add-on

add sound to 3D objects (ambisonic, binaural, etc.)



The screenshot displays the 'Sound Rendering Engine 2015 V4' interface. It features several functional areas:

- UDP Receiver/Dispatcher:** A network control section with a route path and a dispatcher for global, user, and object controls.
- CPU Monitor:** A central monitor showing DSP at 18.0%, mean at 7.6%, and peak at 1.0%, with a 'reset' button.
- Main Processing:** A section for the 'p sound_rendering_engine' with a 'Debug' checkbox and 's debugPrint' option. It includes a 'Max Object Number' set to 5 and 'User Configured' set to 4/4.
- Volume Controls:** A vertical stack of sliders for Global, User0-3, and Obj1-5, ranging from 0 to 100.
- Volume Viewers:** Three sections for 'Ambisonic', 'Binaural 1', and 'Binaural 2', each with sliders for user and object levels.
- Visualization:** Three bar graphs for 'polyEncoder Outputs', 'polyDecoder Outputs', and 'polyMapping Outputs' showing real-time audio processing levels.
- Configuration:** A bottom section for 'Open spatEncoder Visualization windows' with checkboxes for various encoder/decoder/processor options and a 'Loaded Configuration: EVE SPAT' indicator.



Operating: CAVE, multi-users stereoscopy

The interface is divided into several functional areas:

- Perceptual Factors:** Sliders for Source Presence (31), Source Warmth (30), Source Brilliance (30), Room Presence (48), Running Reverberance (34), and Envelopment (24).
- Radiation:** Sliders for Azimuth (9.1 deq), Distance (9.35 m), Elevation (-1.8 deq), Yaw (0.0 deq), Pitch (0.0 deq), Aperture (80.0 deq), and Early width (30.0 deq).
- Options:** Drop (6.0 dB), Radius (1.0 m), pan rev (0.00), Send (Reverb 1), and checkboxes for Air Absorption and Doppler.
- axis and omni:** Two frequency response graphs with gain and frequency sliders. The 'axis' graph has a gain of 0 dB and a frequency of 177 Hz. The 'omni' graph has a gain of +1.7 dB and a frequency of 177 Hz.
- Speaker Layout:** A circular diagram with 20 numbered speakers (1-20) around a central black sphere. The radius is 0.45 m. The front and back directions are indicated.
- polyDecoder Outputs:** A row of 20 vertical level meters.
- polyMapping Outputs:** A row of 20 vertical level meters.
- Open spatEncoder Visualization windows:** Checkboxes for encoderAmbi, encoderBin1, encoderBin2, encoderStereo, decoderAmbi, decoderBin1, decoderBin2, decoderStereo, mapAmbi, mapBin1, mapBin2, and mapStereo.
- Loaded Configuration:** Laptop SPAT and HP position loaded.
- OSC Communications (built-in API):** A list of objects for three users (user1, user2, user3) with object IDs 1 through 5.
- 3D Visualization:** A perspective view of a CAVE environment with checkered walls and floor. A bright green sphere is in the foreground, and a white sphere is on the right wall.
- Code Editor:** A dark window on the right showing code snippets like `m(bge.logic).activate(True)` and `start 1'`.

I. Software Overview

II. Current state of the Project

Established Components

Latest achievements

Future developments



Diffusion tools

Website

User Manual


Application Programming Interface (API)

Github



Diffusion tools

Website



BlenderVR


Blender add-on for Virtual Reality

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BlenderVR 1.0

- [Use Case Examples](#)
- [Testimonials](#)
- [Installation Guide](#)
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- [API Documentation](#)
- [Source Code](#)
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to be merged (dev eyes only)

 **Windows 7 (64bits) Automatic Installer for BlenderVR released!** see the [Installation Guide](#).

BlenderVR

BlenderVR Demoreel 2015



blendervr.limsi.fr
github.com/BlenderVR

BlenderVR is an adaptation of the open source software [Blender](#) to support [CAVE](#)/[VideoWall](#), Head-Mounted Display ([HMD](#)) and external rendering modality engines.

It allows you to run the Blender Game Engine (BGE) on any Virtual Reality architecture (N host - K screens) and supports adaptive stereoscopy and communication protocols such as VRPN and OSC with minimal effort. A complete Sound Rendering Engine has been

<https://blendervr.limsi.fr>

☰ Installation

Install BlenderVR (manual)

Install BlenderVR (automatic)

Install for BlenderVR Development

Install Plugins

☰ First Run

☰ How to Use

☰ Architecture

☰ Development

☰ Frequently Asked Questions

Install BlenderVR (manual)



In order to install BlenderVR you need this guide.

Tip



Windows “standard” (non-developers) users are invited to download the BlenderVR Install Executable for Windows 7 (*though you are still advised to read through the following installation and how to use guides*). See the [Install BlenderVR \(automatic\)](#) page.

Note

If you need the full development setup make sure to follow the [Development Environment](#) guide.

Document Sections

- [Folder Structure](#)
- [Acquiring Blender](#)
- [Acquiring BlenderVR](#)
- [Download Samples Scenes](#)
- [Install Dependencies](#)
- [Quick Setup](#)
- [Running](#)

Daemon

This script runs in the clients and is responsible for spawning the Blender Player.

```
class daemon.Daemon(BlenderVR_modules)
```

Bases: `object`

Background management of the Blender Player and related stuff.

```
main()
```

Start the Daemon, quits any instance of BlenderPlayer running.

```
processCommand(command, argument)
```

Run the received commands

- Parameters:
- `command (str)` – Command to execute in the client machine
 - `argument` – Value depends on the command

```
write(*messages)
```

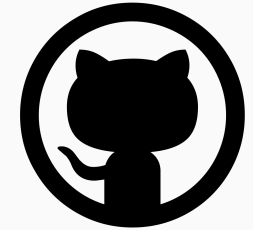
Send message to the client

Diffusion tools

Github



BlenderVR



Repositories

People 8

Teams 1

Settings

source

Blender Virtual Reality Main Code

Updated 17 days ago

19 sept. 2015 21:41 UTC+2

manual

BlenderVR User Manual

Updated 21 days ago

samples

Sample files

Updated on 31 Aug

vrpn

Y forked from [vrpn/vrpn](#)

Virtual Reality Peripheral Network - Official GitHub Repository

Updated on 26 Jul

blender

Blender Source Code

Updated on 2 Jul

python-ovrsdk

Y forked from [jherico/python-ovrsdk](#)

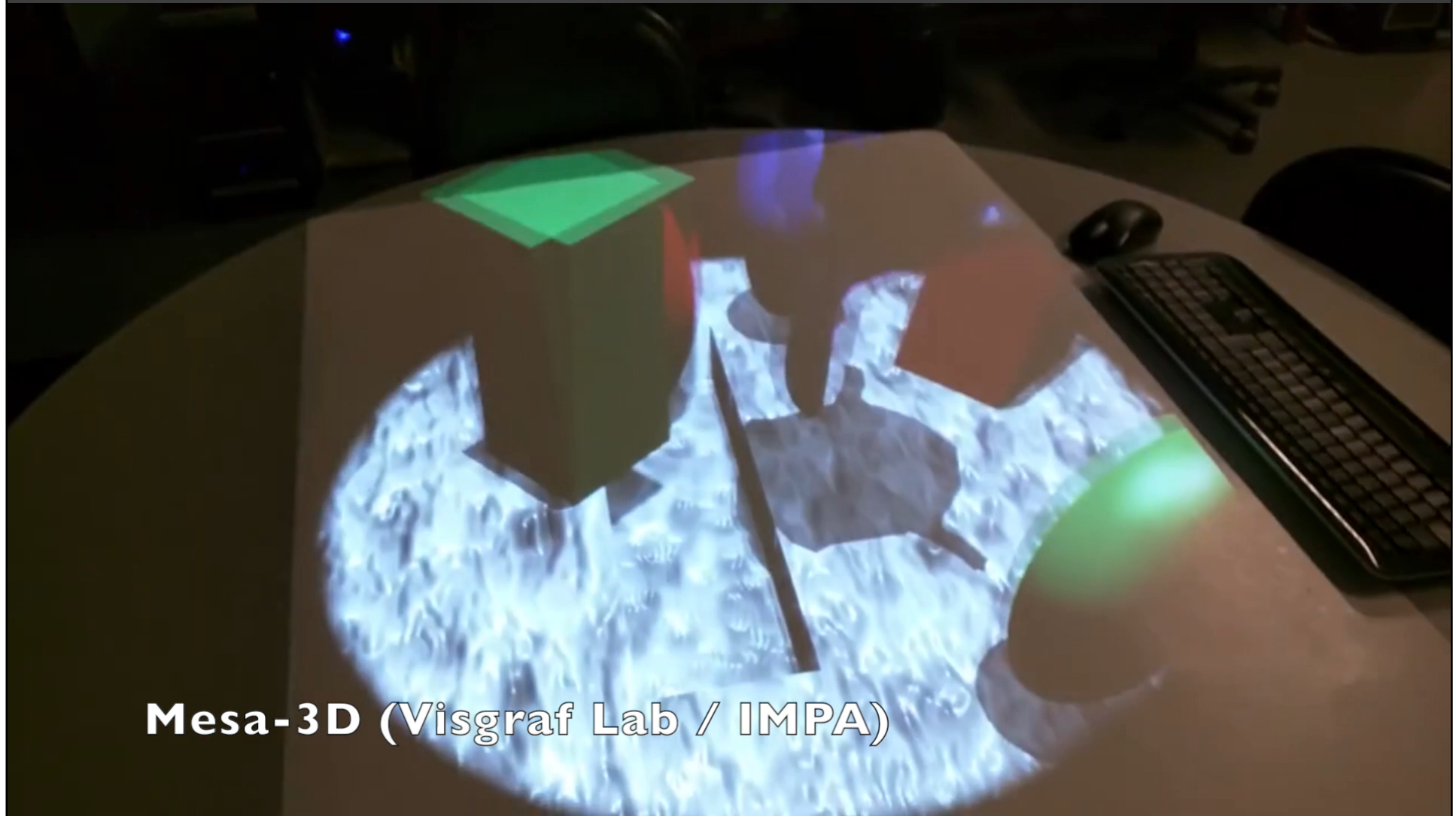
<https://github.com/BlenderVR>

Available Assets

- Step-by-step installation guide
- Detailed documentation
- “How-to-use”: example implementations
- “How-to-use”: video tutorials
- Add-On: Sound Rendering Engine
- Windows 7 Installer (.exe)

Latest developments

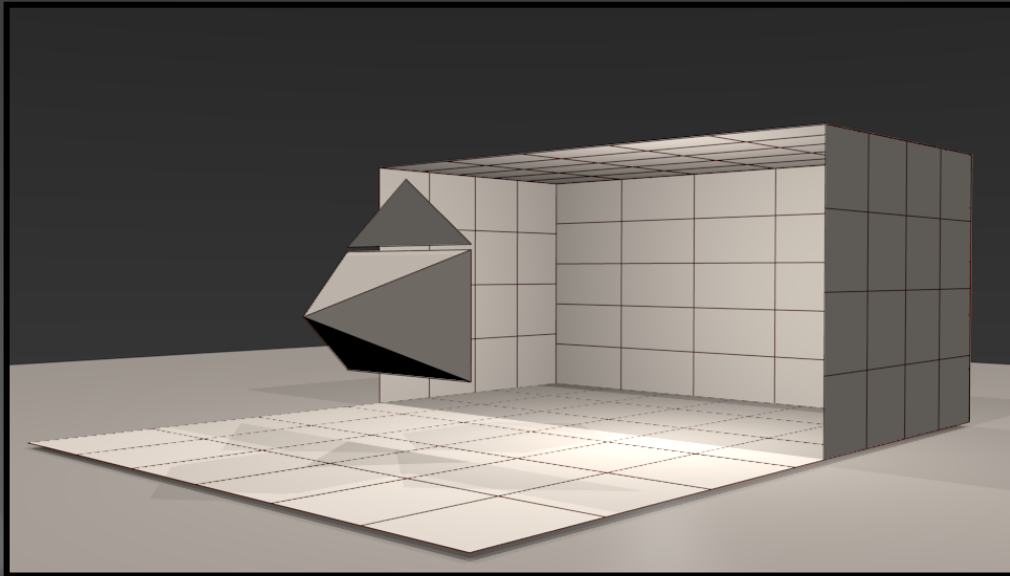
adapt BlenderVR to the 3D-Mesa (Visgraph Lab / IMPA)



Mesa-3D (Visgraf Lab / IMPA)

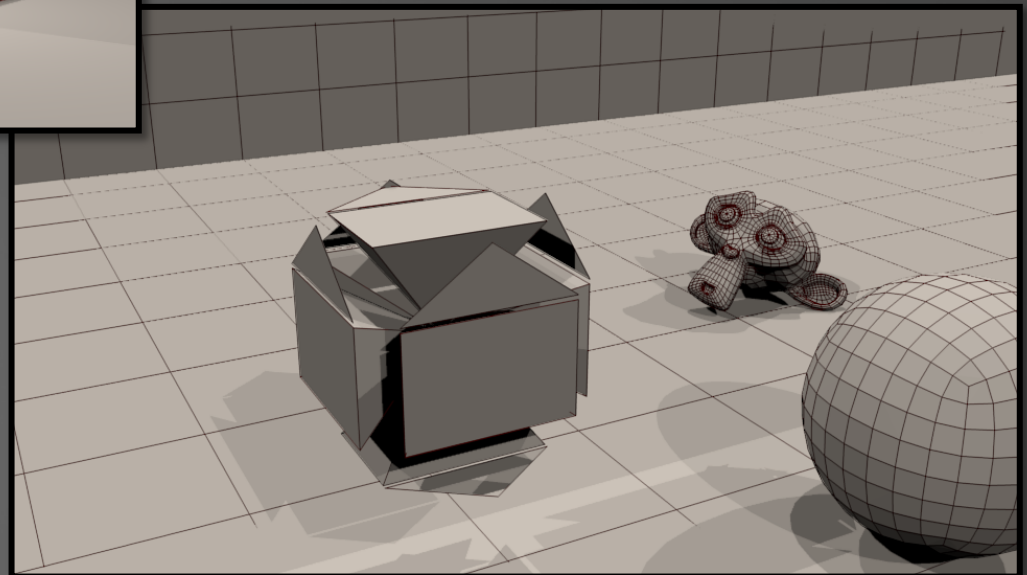
Latest developments

adapt BlenderVR to portable CAVE



Projection scene

Virtual scene



Latest developments

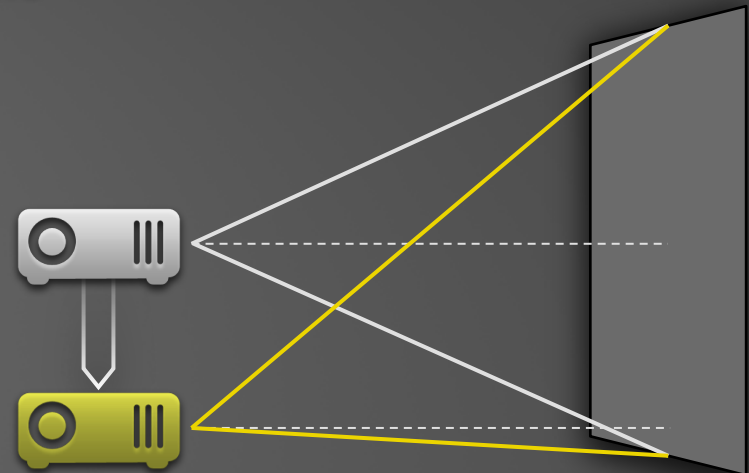
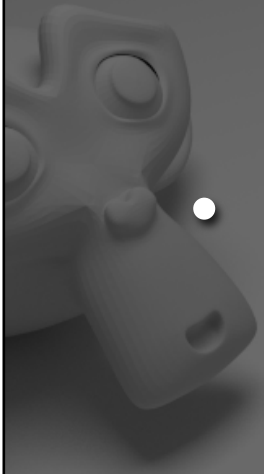
adapt BlenderVR to portable CAVE



Latest developments

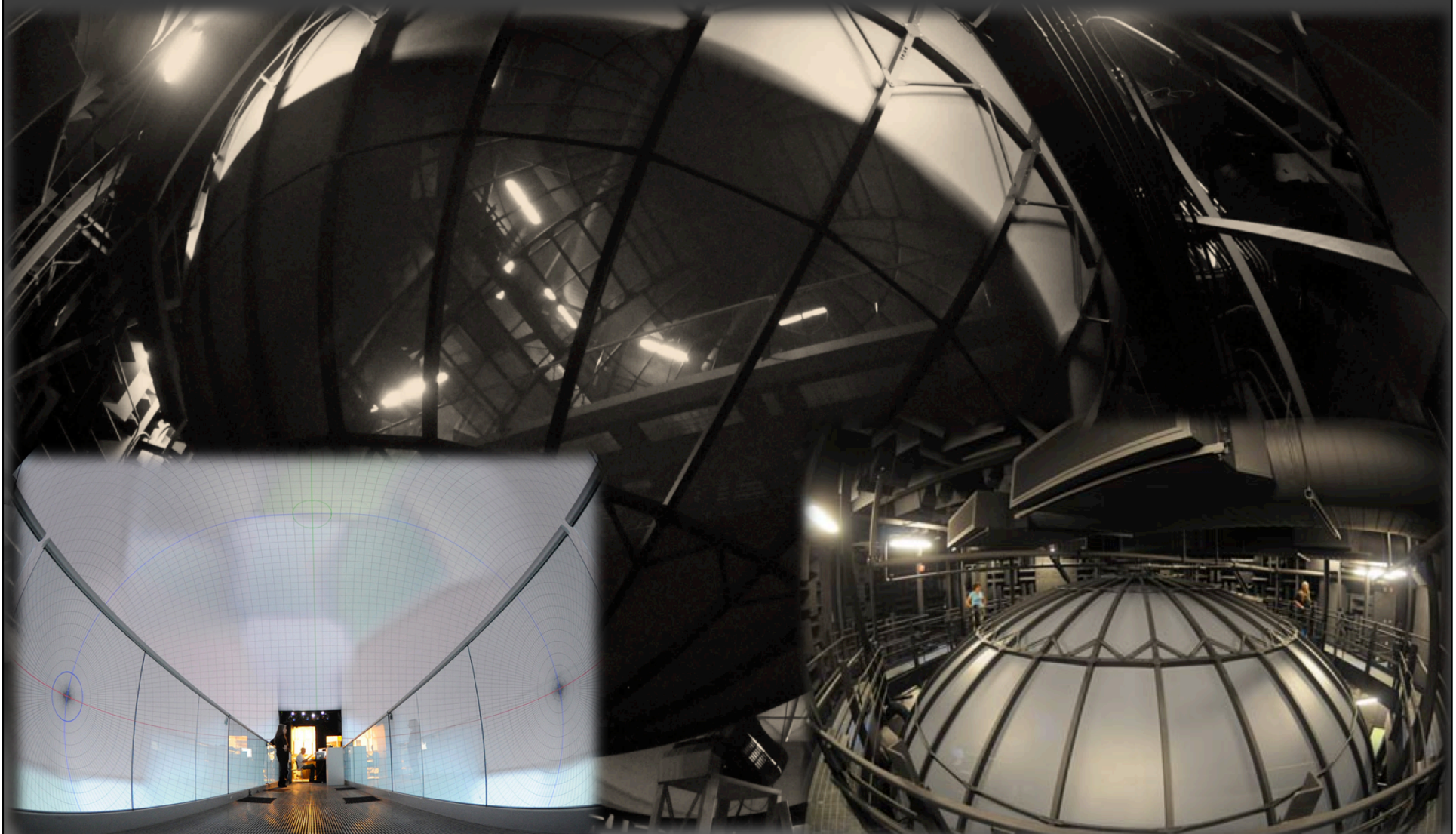
Some of BlenderVR Contribution to Blender code

- **scene.pre_draw_setup** callback:
allows the user to change the camera data right before the rendering calculations
- **bge.render.getStereoEye:**
allows the user to run specific code for each of the rendered stereoscopic eyes in the Game Engine
- **Camera Lens Shift** support in Blender Game Engine



Current/Future developments

Adapt BlenderVR to the Allosphere (at the California NanoSystems Institute)



Current/Future developments

3D Audio and Room Acoustics: VR Concert in Notre-Dame de Paris cathedral

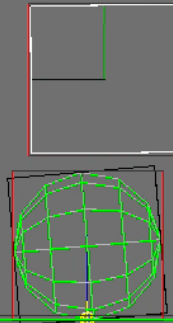


Current/Future developments

Haptic: Bullet based integration of VRPN haptic devices



KX_GameObject hit by 'Cube'



Hit 'Cube' at (-0.00,-0.00,-0.80)
with normal (-0.00,0.01,-1.00)

Current/Future developments

Body tracking integration to animate 3D Avatars in real-time

DK2 rendering based on Frame Buffer Object

BlenderVR-temple: BlenderVR showcase game

BlenderVR temple (WIP)

BlenderVR avatar (WIP)



BlenderVR



Insight: Default use-case scenario

