EVL SUMMER PROJECTS

May 2013

EVL/UIC

Project List

1. Interaction devices and SAGE

   Integrate *oMicron* event server to SAGE:

   - Touch screen (in progress by Arthur)
   - Kinect pointer, voice, ...
   - 6DOF wand in CAVE2 (human augmentics -> SAGE)
   - ...

2. Rewrite of SAGE pointer application

   - Now python application using *WxWidget* (hard to maintain)
   - Leverage or merge with SAGENext pointer application
   - Linux, Window, Mac

3. Mobile user interfaces for VR and SAGE application

   Decoupled UI elements for application (Omegalib, SAGE, ...)

   - Applications running in SAGE or Omegalib
   - Definition of the UI elements
   - Presentation of UI in HTML5/Javascript in modern browsers
   - Shared states between various clients

4. Awesome audio demonstration for CAVE2

   - Omegalib application
   - Sound server

5. Extension of web controller interface (sabi.js)

   - New devices (Receiver, lights, crestron, cluster IPMI commands, ...)
   - Integration of application UI instances (see project 3)
   - Pointer for SAGE and VR apps
     - basic pointer
     - Media library...

6. New applications and content for CAVE2
    - Omegalib based app
    - Human connectome project
    - Stereo3D surround video
    - OSG Earth and GIS datasets
    - ...
7. Omegalib Interface
    - User interface in VR
    - Right now: menu, buttons, slider, ...
    - Advanced elements, voice, ...
8. Information display for CAVE2
    - Using a column of displays next to CAVE2, driven by one PC
    - Display demo information: see display outside EVL
    - Display monitoring information: CPU load, network traffic, ...
    - Sound - graphics - ....
    - 6 Displays: 5 in one column, 1 extra on the side
9. Cluster-wide statistics
    - Data collection back-end for project 8
    - Performance monitoring: network, CPU, GPU, I/O, ...
10. CAVE2 and Windows7
    - Unity4 ?
11. High-speed networking application

- Showing-off the 100Gbps network
- Extending 'Khairi' super-high-resolution animation playback ?
- Moving data to/from Argonne Nat. Lab ?
- ...

12. Raspberry PI computer + Camera

- build a stereo imaging rig
- Pi: little computer running Linux
- new camera system available
- Capture images, synchronize cameras, ...

13. Working with video codecs

- FFMPEG video player for SAGE
- Google WebM codec (VP8) for video streaming, desktop sharing, ...

14. Alioscopy-mode for OmegaLib

- Auto-stereo display (stereo without 3D glasses)
- 8-view stereo rendering
    - create OpenGL shader (?) for OmegaLib rendering
    - see CalVR implementation
- Alioscopy display: 24" LCD lenticular screen

15. Porting stereo panoramas module to OmegaLib

- CalVR module
    - Bob Kooima's code
    - http://csc.lsu.edu/~kooima/research.html#panoview
- To be ported to OmegaLib rendering framework

- Video:
    - High-resolution Stereoscopic Panorama Rendering
    - http://www.youtube.com/watch?v=5dTpLCXRCfA&feature=youtu.be