Poster Session:
Gallery of Projects Enabled by OSC

Session Chair: Matthew Wright
DySE Generator: A sound design tool for virtual reality applications

David Beaudry, Virtual Reality Audio Specialist, UCLA Visualization Portal

306 Soda Hall (This room)
SonART
A new multimedia environment for networked collaboration

Woon Yeo, PhD Candidate,
Stanford University Center for Computer Research in Music and Acoustics (CCRMA)

310 Soda Hall
Human/Computer Interaction projects at CCRMA

Michael Gurevich, PhD Candidate,
Stanford University Center for Computer Research in Music and Acoustics (CCRMA)

320 Soda Hall
Quintet.Net: An interactive performance environment for the Internet

Prof. Georg Hajdu
Master's Program in Multimedia and Music, HfMT Hamburg

306 Soda Hall (This room)
Real-time Distributed Media Applications in LANs with OSC

Tristan Jehan, Dan Overholt,
Hugo Solís Garcia and Cati Vaucelle,
MIT Media Lab

306 Soda Hall (this room)
Max/MSP Programming Practice with OSC

David Wessel, Director, UC Berkeley Center for New Music and Audio Technologies (CNMAT)

320 Soda Hall
An OSC Driver Framework for Gesture Sensors

Stephen Pope,
UC Santa Barbara Center for Research in Electronic Art Technology (CREATE)

306 Soda Hall (this room)
Building Large-scale Interactive Systems with OSC, Siren, CSL, and CRAM

Stephen Travis Pope
Center for Research in Electronic Art Technology (CREATE)
Graduate Program in Media Arts and Technologies (MAT)
University of California, Santa Barbara (UCSB)
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HW/SW Components

- **Siren**: Hierarchical/procedural representation for composers (OSC out)
- **CSL**: Scalable DSP framework (OSC srv)
- **CRAM**: Cluster management for distributed RT OO software (Mgr)
- **CNSI Sphere**: A really cool loud/ bright/sensing space to play in!
Cal. NanoSystems Inst. @ UCSB

- MAT in CNSI: labs, studios, workshops, sphere
- CNSI compute infrastructure
  - Traditional vector supercomputer
  - 1024-node Linux cluster
  - Multimedia processing cluster (TBD)
- Sphere: 3-story I/O space
  - 12-channel overlapping video output
  - 128-channel sound output
  - Camera/microphone/sensor multi-modal input
CNSI Sph
Distributed Sensing, Computation, and Projection = MVC on steroids

**Back-end** application models are scientific/numerical/simulation

Multimodal multiuser **sensing/control** and tracking/mapping farms

**Application** = sensing/tracking policies + output data mappings

**Presentation/interaction** via CNSI Sphere, LAN/WAN streaming

**Infrastructure** uses CRAM mgmnt

**DBs** for configurations, resources, and media content (renderers)

Open Sound Control Conference 2004
Current *Sphere-lite*

**Sensors**
- MIDI
- Matrix
- Graphonic
- OT_Kbd
- Creatovox
- VR Trackers
- Mot. Capture
- AdC_Panner
- (LAN is switched 1000BaseT)

**Gesture Mapping**
- Wintel PCs
- Apple G5s
- Sun Ultras

**Synthesis**
- Apple Xserves
- Apple G5s/G4s
- Echo Layla
- SGI Octanes

**Spatial output**
- Apple G5

**Interfaces**
- Occam/Macco
- OscAR
In Pictures

- Gesture Sensors
- Spatialization
- Compositional Model
- CSL Server Farm
- Surround Output
- Output Drivers
Networked Synthesis/Performance

- Managed “orchestra-scale” sound synthesis, multi-modal gestural sensing and control, and pluriphonic projection (up to 128 channel output in the CNSI sphere)
Siren 2003 (VisualWorks)

Demo

Open Sound Control Conference 2004

Siren 2003 (VisualWorks)

VisualWorks Demo

**Demo**
CSL “Hello world” Program

Sine wave with envelope

// Create a sine oscillator -- this is a comment
Sine osc(220.0);

// Create an ADSR envelope -- args are (dur, a, d, s, r)
ADSR env(3.0, 0.06, 0.2, 0.2, 1.5);

// Create a multiplier
MulOp mul(osc, env);

// Plug it into the output driver
globalIO.set_root(mul);
Multi-host CSL Graphs

- Distributed sub-graph processing with RemoteIO and RemoteFrameStream, RFS protocol, buffering

![Diagram of Multi-host CSL Graphs]

RemoteIO root, server

CSL RFS protocol (TCP, UDP, ATM)

RemoteFrameStream node, client

HOST A

HOST B

OSC

IO
CRAM Manager

- Network/Node
- Node/Service
- Application/Service

- Log/Control pane
  - Run-time monitor
  - Planning
  - DB play-back

Open Sound Control Conference 2004
GestureSensor Drivers & Servers

• Reusable sensor driver framework
  – Serial in, caching/differencing/throttling, OSC out

• GestureSensors: receive OSC or MIDI

  void * mData;  // data array (typically a float *)
  char * mCmd;   // OSC command (without the '/')
  char * mTypeString;  // OSC type string, e.g., "ffft"

  – Event input thread mgmnt
  – Parsing and differencing
  – Map to static or global data or messages

• Subclasses
  – Glove, Ebeam, Matrix, FOBirds, AdC_Panner, etc.
CV-to-OSC

- Multiple-camera 3D motion tracking of multiple sources
- Data mapping for sound synthesis and transformation algorithms
- Intelligent trans-media system that learns and adapts, based on memory of the actions and states of the sensor space
OSC Control of VST Plug-ins

Michael Zbyszynski and Adrian Freed,
UC Berkeley Center for New Music
and Audio Technologies (CNMAT)

310 Soda Hall
Go to the posters!

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- Hajdu: Quintet.Net: An interactive perf. env. for the Internet
- Pope: An OSC Driver Framework for Gesture Sensors
- Jehan et al: Real-time Dist. Media Apps. in LANs with OSC

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