Music in Virtual Worlds:

Due Serata in Sirikata
a Networked “Mixed-Reality Performance”

Robert Hamilton
Ph.D. Candidate

Center for Computer Research in Music and Acoustics (CCRMA)
Department of Music
Stanford University

rob@ccrma.stanford.edu • http://ccrma.stanford.edu/~rob

http://ccrma.stanford.edu/~rob/mito/
Due Serata in Sirikata: a Networked “Mixed-Reality Performance”

**MVW** (Music in Virtual Worlds)

- **Q3OSC**
  - ioquake3
  - Open Sound Control
  - Audio Synthesis

- **Sirikata + OSC**
  - Sirikata
  - Open Sound Control
  - Audio Synthesis
  - Streaming-Audio
  - Laptop Ensemble
  - Acoustic Instruments

- **UT3OSC**
  - UDK (Unreal 3)
  - Open Sound Control
  - Audio Synthesis

Contact: rob@ccrma.stanford.edu
Q3OSC

ioquake3 + Open Sound Control + Audio Synthesis
Q3OSC

Due Serata in Sirikata: a Networked "Mixed-Reality Performance"

rob@ccrma.stanford.edu
Q3OSC

Networking Models: Bi-directional OSC Stream

Due Serata in Sirikata: a Networked “Mixed-Reality Performance

rob@ccrma.stanford.edu
Due Serata in Sirikata: a Networked "Mixed-Reality Performance"

Networking Models: Local + Remote Game Connections

- Game Server
- Game Client
- Game Client
- Game Client
- Game Client
- Game Client
- Game Client
- Game Client

Palo Alto

Seoul

Belfast

Networking Models: Local + Remote Game Connections

- **Game Client**
- **Game Server**
- **UDP**
16-Channel Spherical Speaker Environment
Place and Perspective: **Space-Centric Presentation**

- **Space**, not **Player** becomes the reference for multi-channel Audio Spatialization

- Object positions in auditory space are not translated based on **Player** view or position
nous sommes tous Fernando... (2008)

May 24, 2008 - CCRMA Stage, Stanford University, CA, USA
Stanford Laptop Orchestra - http://slork.stanford.edu

Due Serata in Sirikata: a Networked “Mixed-Reality Performance
MiTo 2009: Mixed-Reality Performance

Sirikata + Open Sound Control + Audio Synthesis + Network Audio
Due Serata in Sirikata: a Networked "Mixed-Reality Performance"
Polytechnico di Milano Bovisa

Great Networking
5 Video Screens
8-channel sound (top notch)
Polytechnico di Milano Bovisa

Due Serata in Sirikata: a Networked "Mixed-Reality Performance"
Polytechnico di Milano Bovisa

Due Serata in Sirikata: a Networked “Mixed-Reality Performance”
Streaming Broadcast in Second Life

Due Serata in Sirikata: a Networked “Mixed-Reality Performance

rob@ccrma.stanford.edu
Due Serata in Sirikata: a Networked "Mixed-Reality Performance"
Controlling Sound with (virtual) Motion

- Open Sound Control
**In C** by Terry Riley; realization by Robert Hamilton, Juan-Pablo Caceres and the Sirikata/MiTo Team

**Virtual Ensemble (Sirikata + STK)**

**Live Ensemble (via JackTrip)**
2008 - Stanford Laptop Orchestra (SLOrk) + Acoustic Instruments
in C.

From Riley's Performance Instructions:

“One of the joys of In C is the interaction of the players in polyrhythmic combinations that spontaneously arise between patterns.”
Musical “pathways” for each individual performer

In C by Terry Riley

Visualizations by Jason MacHardy
Musical “pathways” for each individual performer

*In C* by Terry Riley
Canned Bits Mechanics by Juan-Pablo Caceres & Robert Hamilton

Live Piano
Remote controlled Disklavier
Avatar + control points
Soundfile playback: - player piano sounds
Dei Due Mondi by Robert Hamilton & Juan-Pablo Caceres

8-Channel Ambisonics (SuperCollider)
Speaker-to-User distance
Multiple Speaker Fields
Re-creation of CCRMA Stage & Bovisa Polytechnical Institute Hall
Due Serata in Sirikata: a Networked “Mixed-Reality Performance

Dialoghi  a group improvisation

Chris Chafe (Celleto/Montana)
Charles Nichols (E-Violin/Montana)
Lee Heuermann (Soprano/Montana)

Chryssie Nanou (Sirikata/Milano)
Rob Hamilton (Sirikata/Milano)

Debra Fong (Violin/Stanford)
MiTo 2010: Interactivity + Audience

UDK (Unreal3) + Open Sound Control + Audio Synthesis

Questions?

Thanks