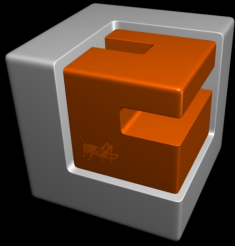# A Behind-the-Scenes Peek at World's First Linux-Based Laptop Orchestra – The Design of L2Ork Infrastructure and Lessons Learned

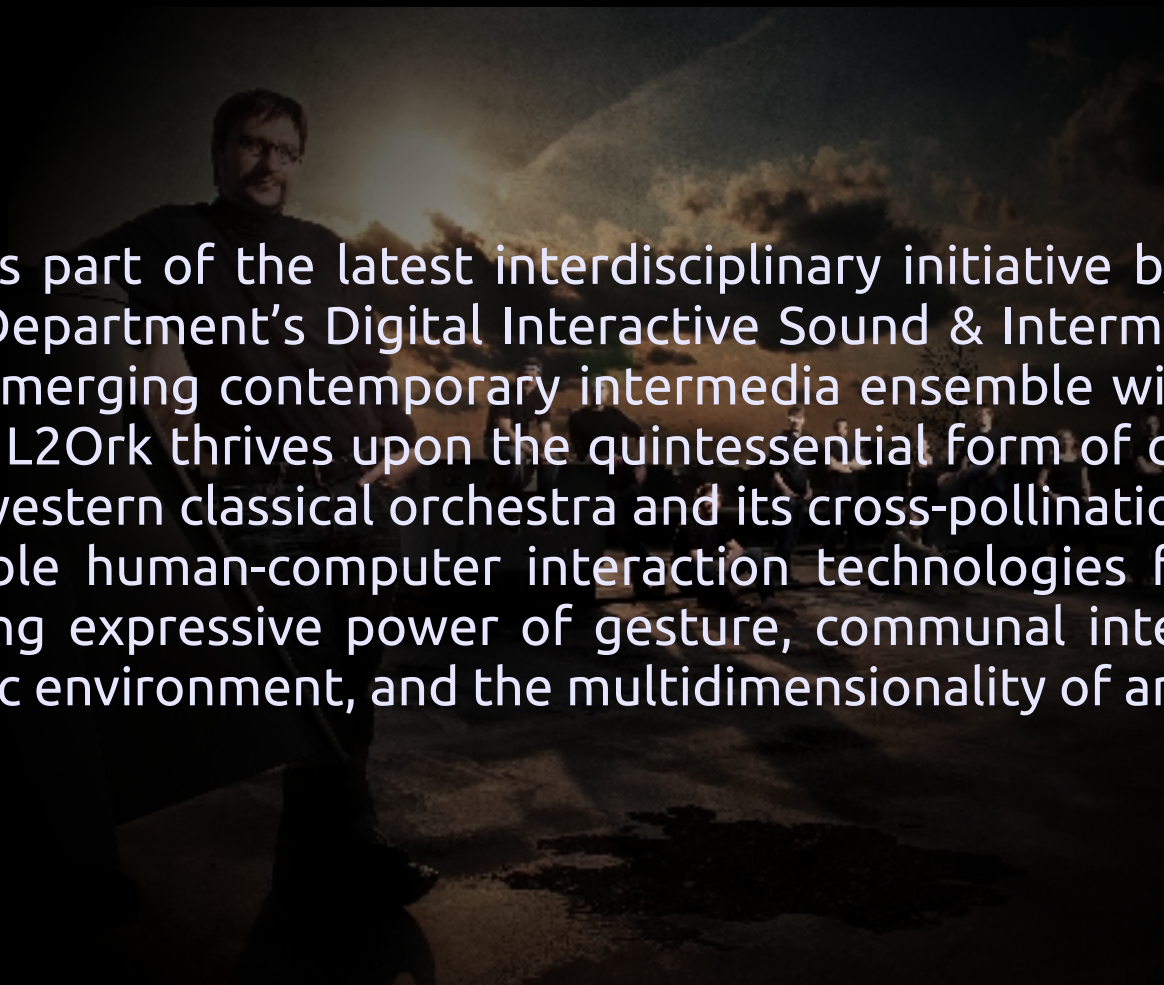Ivica Ico Bukvic
Virginia Tech
DISIS, L2Ork, ICAT, Linuxaudio.org
Department of Music - 0240
Blacksburg, VA, 24061
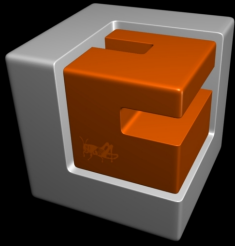ico@vt.edu

l2ork.music.vt.edu
facebook.com/L2Ork

What is L2Ork?

L2Ork is part of the latest interdisciplinary initiative by the Virginia Tech Music Department's Digital Interactive Sound & Intermedia Studio (DISIS). As an emerging contemporary intermedia ensemble with a uniquely open design, L2Ork thrives upon the quintessential form of collaboration found in the western classical orchestra and its cross-pollination with increasingly accessible human-computer interaction technologies for the purpose of exploring expressive power of gesture, communal interaction, discipline-agnostic environment, and the multidimensionality of arts.

Identity & Mission

Physical Presence and Choreography
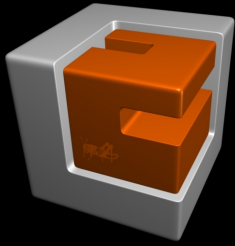
Seamless Integration of Traditional and Contemporary

100% FOSS-Based

Ultra-Affordable Design
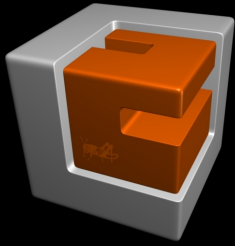
Affirmation as a Professional Ensemble

Fusing STEM and Arts in K-12 Education

Project History

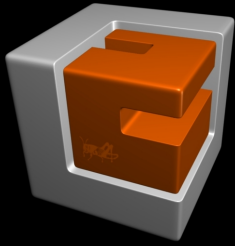|	
2008	Tonmeistertagung Keynote
2009	Fundraising, Grants, Sponsors L2Ork founded Debut (TV, Radio, Internet coverage)
2010	1st Midwest Tour Linux Journal Front Cover Xcaliber Award 2nd NC Tour
2011	1st Place International Laptop Orchestra Composition Competition 3rd European Tour
2012	4th NE Tour One of the 4 Guest Laptop Orchestras on SLEO

Project Support

VT Stakeholders

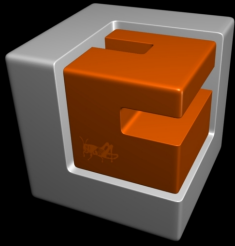|	
AR	ICTAS
Arts Initiative	IDDL
CAUS	ISCE
CCTAD	IT
CHCI	LT
CIDER	Music
CLAHS	OAA
CTEG	OIA
DISIS	SOE
ICAT	SOPAC

Corporate Sponsors

MSI Mobile Inc.
Renoise Inc.
Roland Inc.
Sweetwater Inc.

K-12 Impact

2010   Partnership with the Boys & Girls Club of Southwest Virginia
Boys & Girls Club Satellite Laptop Orchestra
Co-Performing with L2Ork

2011   Co-Performing with L2Ork
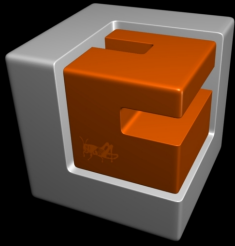
2012   K-12-Friendly Tools For Composition

Hardware

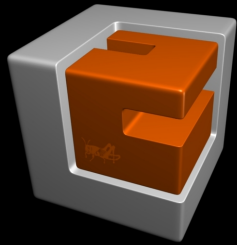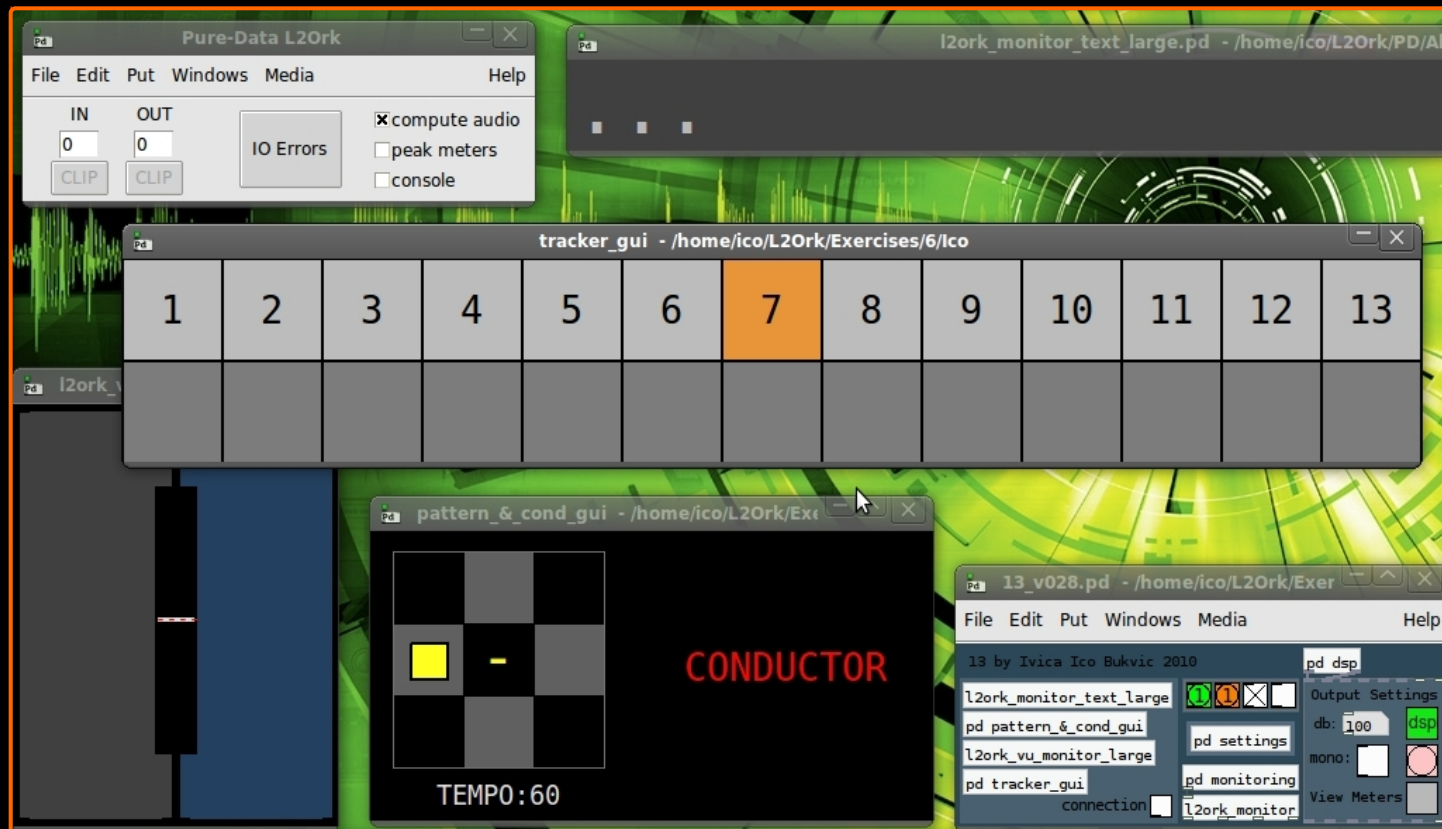|	
MSI U100	$300
Nintendo Wiimote/Nunchuk/Plus	$ 50
UA-1G Soundcard	$ 70
Cables & Accessories	$ 30
Custom-Built Hemispherical Speakers	$250
Sub (shared)	$ 30
TOTAL	**$730**

Software

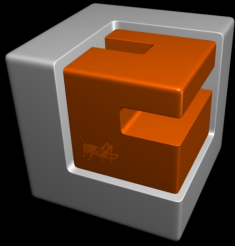**Ubuntu-Based** (currently 10.04/linux-rt, 12.04/linux-lowlatency soon)

2009   Modified Pd-Extended + Custom Version of libCwiid
        Focus on Usability, Stability, UI development

2010   Introduced **Pd-L2Ork**
        Considerable Architectural Changes
        Custom Externals
        Over 200 Bug-Fixes and Improvements
            (Infinite Undo, Cord Inspector, Tooltips, Accelerated GUI)
        Portions Increasingly Adopted Upstream

2012   Custom Version of libCwiid/disis_wiimote
        First FOSS Implementation That Supports Passthrough Mode

Software

VirginiaTech
Invent the Future

Implementation

System Synchronization

Implementation

Performance Environment

Station n

Wired LAN

Data Filtering Pd-L2Ork

Status Data UDP Broadcast

Austru

Briza

Cyclone
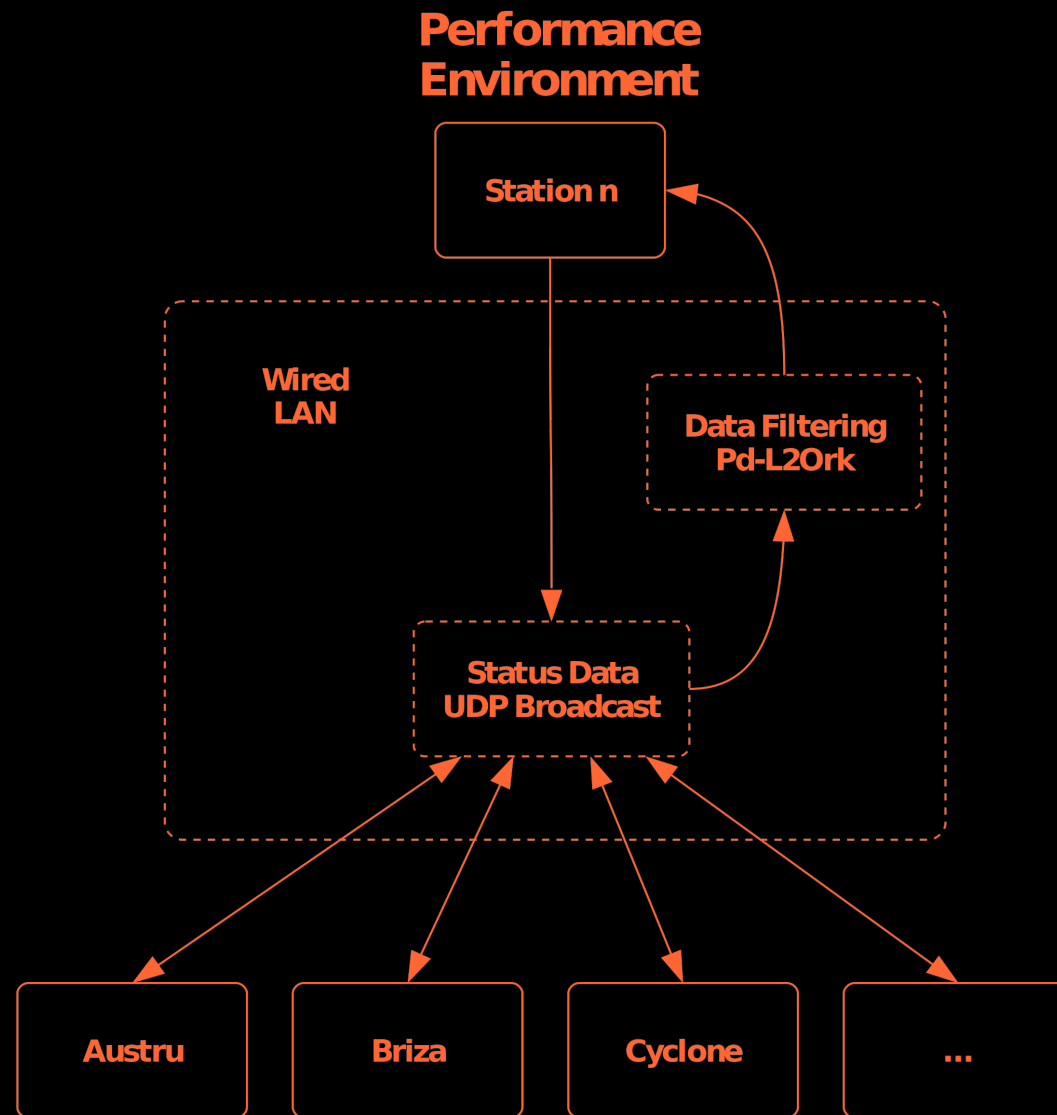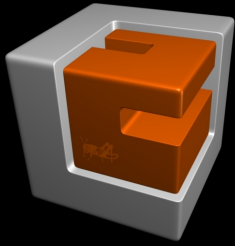
...
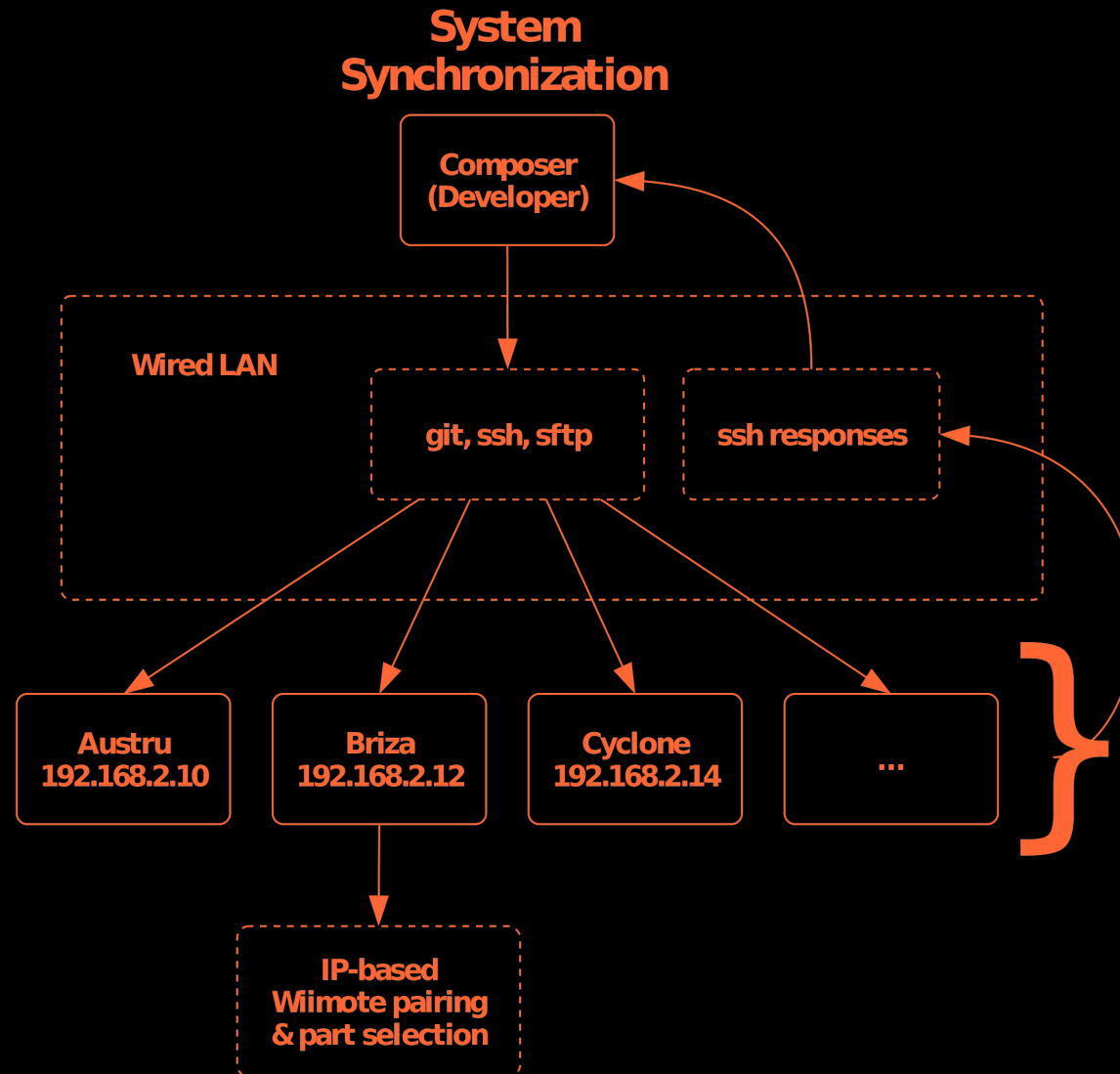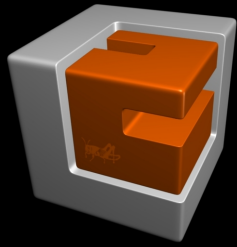
Future Work

Call for Composers to Contribute/Compose for the Ensemble

Devs/Contributors Needed
   Weeding Out Unnecessary Externals
   Separating Headless and GUI-Based Versions
   Getting Rid of the GUI-Engine Socket-Based Communication
   Migrating Pd-L2Ork to JUCE/Qt
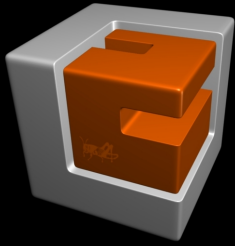   Documentation

Improving Git Framework and Data Tree Structure

Migrate to Ubuntu 12.04 + HP dm1 4142nr

More Satellite Laptop Orchestras

Renoise

More **Composition, Performance, Education**

Lessons Learned

Last 20% is Indeed 80% of the Work
    Usability
    Stability
    User Experience
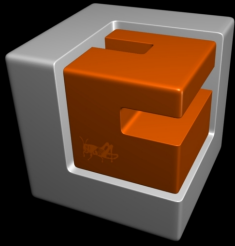   Transparency
    Efficiency

Project Forks
    Increase Workload
    Stimulate Pace of Development
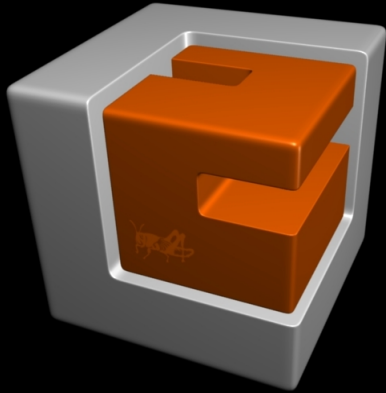
Is Linux Ready For Primetime?
    Wrong Question
    Does It Meet Project's Specific Needs?

Acknowledgments

VT Stakeholders

Sponsors

Partners

LA* Community

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