

**IVICA ICO BUKVIC, D.M.A.**

W: 540.231.6139 M: 540.314.0658  
Blacksburg, VA 24061 – 0141

E-mail: ico@bukvic.net  
ico@vt.edu  
Web: ico.bukvic.net

Associate Professor in Computer Music  
Virginia Tech, School of Performing Arts  
Director, Digital Interactive Sound & Intermedia Studio  
Director, Linux Laptop Orchestra  
Senior Fellow, Institute for Creativity, Arts, and Technology  
Center for Human-Computer Interaction  
Computer Science (by courtesy)

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## EDUCATION

- **Management Academy**, Virginia Tech, 2014-5.
- **D.M.A.** in Composition (cognates in Computer Music Programming and Music Theory), University of Cincinnati, College-Conservatory of Music, 2005.
- **M.M.** in Composition, University of Cincinnati, College-Conservatory of Music, 2001.
- **B.M.** in Composition (Summa Cum Laude), University of Cincinnati, College-Conservatory of Music, 1998.
- **Gymnasium degree** in Music Theory, Music Academy "Vatroslav Lisinski" (Zagreb, Croatia), 1992.

## ADMINISTRATIVE EXPERIENCE

### VIRGINIA TECH

- Intelligent Infrastructure and Human-Centered Communities (Ubiquitous Mobility) Destination Area and the Creative Technologies + Experiences (CT+E) Strategic Growth Area campus-wide Provost-led transdisciplinary initiatives faculty co-lead, 2016-present.
  - Serving as one of the five faculty members on the Provost-appointed CT+E Steering Committee.
  - Participating in shaping mission, vision, research agenda, curricula, and infrastructure investment, including \$75M for UM, \$150K initial seed money for CT+E, and a visioning for the new multi-building Creativity and Innovation District.
- Introduced a new Creative Technologies in Music undergraduate degree option with two sub-tracks in collaboration with colleagues Eric Lyon and Charles Nichols (2015-16).
- Binary Arts (working title) initiative for the School of Performing Arts' music program as an opportunity for shaping the identity co-lead, 2016-present.
- New Interfaces for Musical Expression international conference co-chair (co-hosted with University of Virginia, to be staged at Virginia Tech), 2015-2018.
- Senior Fellow, Institute for Creativity, Arts, and Technology (ICAT) <http://www.icat.vt.edu>, 2012-present.
  - Interim co-director, September-October 2014.
  - Contributed to the design, development, and implementation of ICAT's signature space--the Cube with its 148-speaker audio diffusion system including 9 holosonics, designed to support Wave Field Synthesis, Ambisonics, and Vector Based Amplitude Panning (a \$650,000 project).
- Assistant Co-Director, Collaborative for Creative Technologies in the Arts and Design (CCTAD), 2008-2012.
  - Contributed to design of and fundraising for Institute for Creativity, Arts, and Technology (ICAT) spaces in the new Center for the Arts (a \$100M project), including Cube, Perform Studio, and Sandbox.
- Society for Electro-Acoustic Music in the United States (SEAMUS) national conference Chair <http://seamus.music.vt.edu>, 2015.
  - Raised \$34,000 through internal and external sources with conference producing \$30,000 in residual funds towards supporting self-sufficient programming of similar future events (a \$60,000 project).

- Founder and director of the Linux Laptop Orchestra (L2Ork) and supporting outreach initiatives <http://l2ork.icat.vt.edu>, 2009-present.
  - Recruited 20 on-campus stakeholders and 4 corporate sponsors.
  - Raised funds towards initial implementation and ongoing programmatic needs (est. \$150,000 since 2009).
  - Spearheaded K12 outreach initiatives with regional partners.
- Founder and director of the Digital Interactive Sound and Intermedia Studio (DISIS) <http://disis.music.vt.edu>, 2006-present.
  - Secured \$125,000 for studio infrastructure, design and oversight of the development of the first DISIS in an off-campus rented facility, 2006-7.
  - 50+ undergraduate part-time assistantships funded through various internally and externally funded projects and initiatives, 2007-present.
  - Incubator for other initiatives, including Linux Laptop Orchestra (L2Ork), 2009-present.
  - Through ICAT-led initiative designed a new and permanent DISIS space in the Newman Library (a \$600,000 project). Supervision of its implementation and transition into the new space, 2014-5.

## OTHER

- Society for Electro-Acoustic Music in the United States (SEAMUS) 501c3 national organization Board Member and Treasurer (elected), 2005-2011.
- Linux Audio Consortium Director (elected) <http://linuxaudio.org>, 2005-present.
  - Consolidation of online resources, building membership base, and securing permanent content hosting solution with 1-3 TB (Terabytes) of monthly traffic.
- Production manager for the ICMC 2003 conference, Singapore, 2003.
- *MusicX* international summer music festival series administrative assistant, 1998-2005.

## TEACHING EXPERIENCE

*Associate Professor*, Virginia Tech (teaching evaluations consistently score in the top 15%), 2006-present.

- New Musical Interfaces (MUS4014H) (new honors transdisciplinary course), Spring 2017.
- Computer Music & Multimedia Design (MUS3065-6) (new 2-semester course), Fall 2006-present.
- Linux Laptop Orchestra (MUS4124, MUS3314, MUS2974 and MUS 4974) (new ensemble and independent studies), Fall 2009-present.
- Revamped version of the Introduction to Music Technology (MUS2054), Spring 2006-2011.
- Independent Studies, Spring 2006-present.
- Composition, Spring 2006-2012.
- Soundtrack & Effects Composition (pilot course), Fall 2007.

*Adjunct Faculty*, University of Cincinnati, College-Conservatory of Music, 2005.

- Linux and Multimedia, Winter, Spring, 2005.

*Visiting Professor, Oberlin College, Spring 2004.*

- Composition, Spring 2004.
- Studio Skills for Composers (TECH 150), Spring 2004.
- Computer Music (TECH 201), Spring 2004.

*Graduate Teaching Assistant, University of Cincinnati, College-Conservatory of Music, 1999-2003.*

- Linux and Multimedia (new course), 2002-2003.
- Computer Music Composition (substitute faculty), 2002-2003.
- Intro to Electronic Music, 2000-2003.
- Honors Music Theory and Analysis, 1999-2000.
- Composition, 1998-2003.

## RESEARCH

Additional information on select projects also available at:

- <http://ico.bukvic.net>
- <http://disis.music.vt.edu/main/portfolio.html> (faculty and student projects)
- [http://ico.bukvic.net/PDF/Ivica\\_Ico\\_Bukvic\\_Portfolio.pdf](http://ico.bukvic.net/PDF/Ivica_Ico_Bukvic_Portfolio.pdf) (pre-2012 project highlights)

*Musical Robots (PI): 2016-present.*

- Expanding the Maker learning model to also include prototyping (semi)autonomous robotic instruments.

*Raspberry Pi Orchestra (PI): 2016-present.*

- An addition to the Linux Laptop Orchestra initiative inspired by the Maker idea.
- Crowd-sourced element where students partake in designing an instrument and collaboratively composing a piece through improvisation-centric rehearsals.

*"Interactive Multimodal Data Platform for Bridging Strategic Planning & Thinking" (PI): 2016.*

- \$50,000 awarded by the National Science Foundation.
- Research team: Ivica Bukvic, Siddharth Narayanan, Tianyu Ge, Lisa Garcia.

*[Cinematicraft](#) (PI): 2016-present.*

- Interactive Machinima using Kinect HD and a custom Minecraft mod.
- Internal pilot showcased at Virginia Tech's SXSW 2016.
- Installed in the Science Museum of Western Virginia and Virginia Tech Visitor Center, 2016.

Ultrasonic mobile communication and synchronization prototype (PI): 2016.

- Devised in collaboration with the [Diavolo](#) performance group.

“Collaborative Analysis of Large-scale Mixed Reality Data” (Co-investigator): 2016.

- \$100,000 awarded by [Microsoft](#) Inc.
- Use of HoloLens in sound-centric AR scenarios.

The Development of novel spatialization and sonification strategies for dense speaker arrays (Co-PI): 2014-6.

- \$650,000 internal infrastructure grant.
- A unique 147-speaker environment with Dante backend, Wave1 Wave Field Synthesis system, Vector-Based Amplitude Panning, and Ambisonic software diffusion, and 9 holosonic speakers, 4 of which are on motorized remotely controllable units.
- Design of a high-performance commercial [D<sup>4</sup>](#) audio spatialization library for Max/MSP programming language. *D<sup>4</sup>* was tested with 1,011 channels of 24bit 48KHz audio streams mixed down to 128 physical outputs in real-time with sub-21 millisecond latency.

[Orb](#) interactive audio-visual exploration of a large multimedia project database in collaboration with Profs. Dane Webster and Aki Ishida (PI): 2014-6.

- \$20,000 grant for an interactive kiosk in the Virginia Tech National Capital Region.
- \$5,000 grant (2015-6) from NASA to implement a pilot interactive visualization of the autonomous vehicle projects in the Hampton Roads, Virginia, region.
- Use of Leap Motion, Processing, and a custom database backend to render projects and their relationships, while providing an intuitive way to navigate project landscape.
- One graduate and one undergraduate assistantship.

[Glasstra](#) modular GUI for a laptop orchestra using Google Glass and FUDI networked protocol, 2014-5.

- Pilot integration with the Linux Laptop Orchestra (L2Ork) using pd-l2ork.
- Showcase as part of the SEAMUS 2015 conference.
- One graduate assistantship.

“II-NEW: Living Lab for Asynchronous and Synchronous Investigation of Virtual and Real Environments” (Co-PI): 2013-15.

- \$585,510 awarded by the National Science Foundation.
- Research team: Benjamin Knapp, James Ivory, Yong Cao, Ivica Bukvic, Nicholas Polys.
- Infrastructure grant for visual and aural tracking hardware for the new Center for the Arts for the purpose of linking real and virtual Center for the Arts through various artistic and scientific pilot projects.

OPERAcraft (Co-PI): 2013-14.

- \$25,000 internal award by Institute for Creativity, Arts, and Technology (ICAT).
- Retrofitting Minecraft sandbox software platform to support world's first telematic opera performance, including real-time mouth movement based on captured audio signal from singers, expanded expressive power of avatars (arm movement, gestures, facial expressions), and added real-time production tools, including multiple camera angles, scene transitions, subtitles, and backstage cues.
- Implemented FUDI networked protocol between pd-l2ork and Minecraft.

"EAGER: Drummer Game: A Massive-Interactive Socially-Enabled Strategy Game" (Co-PI): 2009-10.

- \$149,648 awarded by the National Science Foundation.
- Cross-disciplinary research involving Computer Science, Center for Human-Computer Interaction (CHCI), School of Performing Arts (SOPA), and School of Visual Arts (SOVA).
- Focus on design and development of a new gaming paradigm that combines spectacle/live performance and professional musicianship, CUDA platform for massive crowd simulation, and interactive algorithmic music.
- 12 performers (percussionists) use beat patterns to control their respective cohorts of Terracotta soldiers in a battle. Audience members' engagement boosts troops' morale.
- Use of authentic water buffalo skin Chinese drums.

Linux Laptop Orchestra (L2Ork) (PI): Summer 2009-present.

- The design and development of World's first Linux-powered laptop orchestra, including custom hardware, supporting software, and optimization of the Linux platform.
- Development of the pd-l2ork (an independent fork of Pure-Data maintained as part of the L2Ork project) with over 1,000 patches and improvements to the pd-extended platform ([http://l2ork.music.vt.edu/main/?page\\_id=56](http://l2ork.music.vt.edu/main/?page_id=56)).
- Initial summer research initiative sponsored 12 undergraduate researchers.
- Created a network of 20 on-campus stakeholders. Raised \$50,000 in startup funds from internal and external ([MSI Computer](#), [Renoise](#), [Roland Corp.](#), and [Sweetwater](#)) sources.
- Secured ongoing \$10,000 sponsorship through Virginia Tech Technology-enhanced Learning and Online Strategies (TLOS) for the purpose of purchasing new laptops, 2012.
- \$46,250 (\$26,500 through on-campus stakeholders and another \$19,750 through coordinated student initiatives) fund-raising for the inaugural three-week tour of Europe, 2011.
- Secured over \$15,000 for additional laptop orchestra tours.
- Partnership with Boys & Girls Club of Roanoke, Virginia, building a satellite laptop orchestra for the inner city 4<sup>th</sup> and 5<sup>th</sup> graders. Students were trained as part of an afterschool program with the goal of designing their own instruments and co-performing as part of a DISIS event at Virginia Tech. The project was originally externally funded by 21<sup>st</sup> Century and Bank of America grants (\$20,000), securing additional 3 undergraduate research positions, 2010-present.
- Developed pd-l2ork K-12 module for K-12 education purposes, interfacing with Arduino boards, Nintendo Wii hardware, and Raspberry Pi GPIO. K-12 module was used in over half-dozen Maker camps and after-school educational programs across the world, including inaugural Raspberry Pi

Orchestra gifted summer program in partnership with the Montgomery County Public Schools, 2012-present.

- Showcased L2Ork as part of various outreach activities, including Honor Band, Kids Tech University, VT Roanoke campus, Pre-College Initiative, and presentations at conferences (MUSICACOUSTICA 2010, SEAMUS 2011, NIME 2011, SLEO 2012).
- Established L2Ork endowment fund through Virginia Tech College of Liberal Arts & Human Sciences, 2012.
- Helped start 7 similar international laptop orchestra initiatives (Boys & Girls Club of Southwestern Virginia, University of North Carolina Greensboro, Stetson University, Shawnee State University, Santa Clara University, Brasilia laptop ensemble, Sweet Briar College), 6 of which rely in part on L2Ork hardware design and software infrastructure.
- Seven publications.

*Discrete REconfigurable Aural Matrix (DREAM) (a.k.a. AMHDI)* two-dimensional speaker array for the sonification of composite Geometric shapes and images (PI): 2006-2012.

- Principal Investigator for a collaborative project involving Virginia Tech's Computer Science, Center for Human-Computer Interaction (CHCI), Collaborative for Creative Technologies in the Arts and Design (CCTAD), and Music.
- 'Interactive Aural Painting' concept.
- Use of an aural technology for the visually impaired: the aural PONG game concept.
- \$32,000 Virginia Tech College of Liberal Arts and Human Sciences exploratory research grant for the phase I.
- \$20,000 Virginia Tech Institute for Society, Culture, and Environment (ISCE) summer grant.
- One Patent disclosure, two publications.

Use of Sonification to Improve Code Comprehension (Co-PI): Summer 2008-2012.

- Research into use of sonification in IDEs.
- Project in part sponsored by the NSF's Research Experience for the Undergraduates (2008, 2009).
- One Publication.
- Foundation for one Masters thesis in the Center for Human-Computer Interaction.

*Digital Arts Research Collaborative REVO:OVER* commissioned by the new Arts Museum of Western Virginia (Co-PI): 2007-2008.

- Est. \$500,000 in funding of a multimedia installation.
- Interactive multimedia installation featuring video, 3D graphics, experimental 3D audio array and supporting algorithms, and interactive layer for audience participation.
- Responsible for building a CAVE-like system in Max/MSP/Jitter as a "glue" infrastructure for contributions from six members of the collaborative, sound and music production, and the interaction design and implementation.

*Intelligent Sustainable Space*, a collaborative endeavor among Wake Forest, Wachovia, Virginia Tech, Winston-Salem, Winston-Salem Center for Design Innovation, and Workplace Strategies Inc. (PI): Fall 2007.

- Focus on development of intelligent sustainable space shared between Wachovia inc. and the Wake Forest MBA program.
- Use of interactive multimedia installation to facilitate collaboration and information retrieval.
- \$14,200 in initial funding for virtual interactive space prototyping using Unity3D.
- \$10,000 in Phase 2 funding from Virginia Tech's Institute for Critical Technology and Applied Science (ICTAS), and the Institute for Society, Culture, and Environment (ISCE).

*Networked Ensemble* (collaborator) – joint project among National University of Singapore, Stanford University and Virginia Tech with focus on exploring collaborative potential of network-based music interaction: 2007-2009.

- Awarded \$975,978 SGD.

*Mind-Body Interactive* (a.k.a. *Interactive Taiji*) (PI): Summer 2008-2012.

- Project involving Music, Computer Science, Center for Human-Computer Interaction (CHCI), Human Development, and Education.
- The design and development of a taiji audio-visual game system for use in K-12 education and its assessment as a catalyst for promoting self-regulation.
- Collaborative effort with regional K-12 institutions (Craig and Montgomery Counties).
- \$5,000 Art+Technology+Education seed grant.
- \$5,000 grant from the Virginia Tech's Institute for Distance and Distributed Learning (IDDL) for phase II, focusing on retrofitting the system for distance learning, with a goal of producing an online-based physical education module.

*μ Library for Interfacing Max/MSP/Jitter with Unity3D* (PI): Spring 2008.

- Software layer for seamless integration of Max/MSP/Jitter (and/or Pure-Data) and Unity3D.
- Available from <http://ico.bukvic.net/Max/>
- One patent disclosure June 2008.

*Virginia Tech Stakeholders Project* soundtrack, effects, and interactivity for the multimedia 2-DVD production for the funding campaign of the new Performing Arts Center (Co-PI): Spring 2007.

- Received \$25,000 internal grant.
- Soundtrack for the visual flyby animation.
- Sound effects, ambient sounds, and interactive algorithms for the interactive first-person virtual tour of the new facility using Unity3D engine.
- Orchestral soundtrack for the video documentary.
- Two undergraduate assistantships.



*SMILE* project dedicated to teaching science and mathematics to young children in remote regions of Appalachia (Co-PI): 2007-present.

- \$20,000 Virginia Tech ISCE summer grant, April, 2007.
- Design of tunes as scientific metaphors.
- Three undergraduate assistantships.

*Shaders Ahoy!* collection of real-time texture processing algorithms using shader language for Max/MSP/Jitter released under the GPL license: 2007.

- Available for download from <http://ico.bukvic.net/Max/>

*disis\_munger~* (a.k.a. *munger1~*) porting and enhancing the *munger~* real-time granular synthesis external using a platform and software-independent flext framework (PI): Spring 2007.

- Collaboration with Princeton University's PeRColate author Dr. Dan Trueman, and flext author Thomas Grill.
- Pure-Data and Max/MSP-transparent code.

*0<sup>th</sup> Sound* recontextualization of silence through association with a mathematical paradox of number zero: 2005-2006.

- Philosophical and pragmatic exploration of silence in contemporary multimedia art.
- Preliminary work presented at SPARK festival in Minnesota, February, 2005.

*RTMix* Real-Time Interactive Multimedia Art Performance, Composition, and Coaching Interface: 2001-2004.

- Libre software written in C++/Qt for the purpose of establishing a unifying performance interface for the live and interactive multimedia art employing a variety of DSP software.
- \$1,500.00 University of Cincinnati Research Council Grant, 2002.
- 3 conference presentations and 2 papers, including *Organised Sound*, December 2002.
- Central interface for several personal compositions.
- Featured on the Stanford's CCRMA (<http://ccrma.stanford.edu/planetccrma/software/>), Eastman University's *Turnkey*, *DeMuDi*, and *APODIO* Linux distributions, and College-Conservatory of Music (CCM)<sup>2</sup> studios.
- Documentation available at <http://ico.bukvic.net/Linux/RTMix/RTMix-docs/>

*Interactive 3D Multimedia Landscapes* as a form of modular work of art: 2001-2002.

- Utilizes 3DML meta-language that enables users to experience interactive 3D world populated with the 3D positioned sound in their Internet browsers.
- \$1,500.00 University of Cincinnati Research Council Grant, 2001.
- Exploration of an immersive artistic installation genre accessible via web browser in which listener/observer actively determines the pace and subsequently the structure of a piece.

Stochastic Phrase and Density Structure Generator (*SPiDSiG*): 2001.

- Cross-platform open source software written in C designed for sculpting formal density of a work of art by utilizing subtractive stochastic approach with complementary prime forms of mathematical curves as probability descriptors.
- Presented at the *SEAMUS 2002* conference in Iowa City, Iowa, April 2002.

*Soundmesh* Internet2 low-latency real-time performance framework in collaboration with Mara Helmuth: 2000-2005.

- One publication.

Contributions to the *RTcmix* project, designing interactive DSP unit generators: 1998-2001.

## GRANTS & FUNDING

### External

2016

- \$50,000 (100%, PI) Interactive Multimodal Data Platform for Bridging Strategic Planning & Thinking, Sponsored by the National Science Foundation. Research team: Ivica Ico Bukvic, Siddharth Narayanan, Tianyu Ge, Lisa Garcia.

2014

- \$20,000 (40%, PI) The Orb: A Proposal for an Interactive Audio-Visual Installation for the Arlington Virginia Tech Research Center, Sponsored by VT National Capital Region research center. Research team: Ivica Ico Bukvic, Dane Webster, Aki Ishida.

2013

- \$2,000 (100%) Boys & Girls Club of Southwestern Virginia to fund one undergraduate student to work with 4th and 5th graders to design their own laptop orchestra instruments and eventually perform a new improvisatory composition using newfound instruments.
- \$12,000 (50%, Co-PI) commission from Ballston Business Improvement District for "Cloud" interactive community-driven installation. Research team: Ivica Ico Bukvic, Aki Ishida.
- \$585,510 (20%, Co-PI) II-NEW: Living Lab for Asynchronous and Synchronous Investigation of Virtual and Real Environments, National Science Foundation (NSF). Research team: Benjamin Knapp, James Ivory, Yong Cao, Ivica Bukvic, Nicholas Polys.
- \$36,124 (25%, Co-PI) sponsorship/commission for the Interactive Lantern Field audio-visual installation from Philips Corporation (\$30,634), Japan Foundation New York (\$1,390), National Cherry Blossom Festival (\$1,400), Smithsonian (\$1,800) and private donors (\$900). Research team: Aki Ishida, Ivica Ico Bukvic, Benjamin Knapp, Brennon Bortz.

2010

- \$1,261 (100%) Secured fourth corporate sponsorship from *Renoise* software company in a form of a site license for the *Linux Laptop Orchestra*.
- \$20,000 (100%) external grant through the *Boys & Girls Club* of Southwest Virginia (sponsored by *21<sup>st</sup> Century* and *Bank of America*) for the creation of the satellite laptop orchestra. Research team: Ivica Ico Bukvic, Eric Standley.

## 2009

- \$149,648 (25%, Co-PI) awarded "EAGER: Drummer Game: A Massive-Interactive Socially-Enabled Strategy Game" proposal to the National Science Foundation. Research team: Yong Cao, Francis Quek, Ivica Bukvic, Dane Webster.
- Est. \$2,000 (100%) Secured three corporate sponsorships for the *Linux Laptop Orchestra* (L2Ork), including seven laptops sponsored by MSI and eight soundcards sponsored by Sweetwater and additional hardware sponsored by Roland Inc. at cost. Research team: Ivica Ico Bukvic, Tom Martin.

## 2008

- \$14,200 (67%) *Sustainable, Intelligent Environment for Communal Interaction with Art and Culture* pilot project sponsored by the Wake Forest for the virtual rendition of the multimedia installation concept. Research Team: Ivica Ico Bukvic, Dane Webster, Scott Betz (Winston-Salem), Peter Marsh (Workplace Strategies), Dan Fogel (Wake Forest).

## 2007

- \$975,978 SGD, (Collaborator) *Networked Ensemble* proposal in collaboration with National University of Singapore and Stanford University. Research team: Lonce Wyse (National University of Singapore), Chee-Kong Ho, Kevin McGee, Damien Lock, Roger Zimmermann, Michael Gurevich, Ivica Ico Bukvic.
- Est. \$500,000 (15%, Co-PI) Arts Museum of Western Virginia grant as part of the Digital Art Research Collective (DARC) group to develop an interactive multimedia art installation for the grand opening of the new museum. Sponsored four graduate and two undergraduate assistantships. Credit and PI responsibility equally distributed among participants. Research Team: Truman Capone, Carol Burch-Brown, Ivica Ico Bukvic, Steve Harrison, Joy Rosenthal, Simone Paterson, Dane Webster.

**Internal**

## 2016

- \$3,000 grant from Institute for Creativity, Arts, and Technology (ICAT) for the Aural Surface proposal. Research team: Matt Wagner, Ivica Ico Bukvic.

## 2015

- \$2,500 grant from Institute for Creativity, Arts, and Technology (ICAT) for the Awareness Practice and the Foundations of The Creative Process series of workshops. Research team: Douglas Lindner, Richard Goff, Ivica Ico Bukvic.

## 2014

- \$8,000 sponsorship from Institute for Creativity, Arts, and Technology (ICAT), College of Architecture and Urban Studies, College of Liberal Arts & Human Sciences, and the School of Performing Arts for the "Cloud" installation. Research team: Aki Ishida, Ivica Ico Bukvic.
- \$31,000 Society for the 2015 Electro-Acoustic Music in the United States (SEAMUS) national conference sponsorship from Virginia Tech Provost, College of Liberal Arts & Human Sciences (CLAHS), School of Performing Arts, Institute for Creativity, Arts, and Technology (ICAT), Institute for Critical Technology and Applied Science (ICTAS), Center for Human-Computer Interaction (CHCI), Graduate School, Vice President for Information Technology, College of Engineering, Institute for Society, Culture, and Environment (ISCE), University Libraries, and Department of Computer Science. Conference organizers: Ivica Ico Bukvic (chair), Eric Lyon, Charles Nichols.
- \$13,000 Institute for Creativity, Arts, and Technology Fellowship.

## 2013

- \$5,000 sponsorship from Virginia Tech Research Center Arlington and the Institute for Society, Culture, and Environment for the "Cloud" installation. Research team: Aki Ishida, Ivica Ico Bukvic.
- Virginia Tech Center for Human-Computer Interaction fall Graduate Research Assistantship for the sonification research project. Research team: Ivica Ico Bukvic, Benjamin Knapp.
- \$4,200 sponsorship for the Interactive Lantern Field audio-visual installation from the Institute for Creativity, Arts, and Technology (ICAT), College of Architecture and Urban Studies, and the Department of Music. Research team: Aki Ishida, Ivica Ico Bukvic.
- Virginia Tech Center for Human-Computer Interaction spring Graduate Research Assistantship for the audio editing and cybersecurity data analytics project. Research team: Chris North, Benjamin Knapp, Ivica Ico Bukvic. Spring, 2013.
- \$2,500 Linux Laptop Orchestra (L2Ork) sponsorship by Virginia Tech Center for Human-Computer Interaction (CHCI).
- \$25,000 OPERAcraft by the Institute for Creativity, Arts, and Technology (ICAT). Research team: Ariana Wyatt, Ivica Ico Bukvic, Tracy Cowden, Katie Dredger, Kelly Parkes.

## 2012

- \$3,000 Virginia Tech Institute for Creativity, Arts, and Technology (ICAT) matching support for the Luminous Kite Lanterns exhibit at Blacksburg Farmers Market. Research team: Aki Ishida, Ivica Ico Bukvic, Benjamin Knapp, Brennon Bortz.
- \$16,000 Virginia Tech Center for Human-Computer Interaction Summer Graduate Research Assistantship for the GAMES Project Teacher Dashboard project. Research team: Michael Evans, Troy Abel, Ivica Ico Bukvic.
- \$4,100 Institute for Creativity, Arts & Technology grant for the development of a K-12 version of the pd-l2ork software and its deployment in collaboration with the Boys & Girls Club of Southwest Virginia. Research team: Ivica Ico Bukvic, Liesl Baum, Bennett Layman, Kendall Woodard.

## 2011

- \$8,188 Virginia Tech Institute for Distance and Distributed Learning grant for the implementation of the *Mind-Body Interactive* (formerly known as *Interactive Taiji*) course, including teaching the course for three consecutive years. Research team: Ivica Ico Bukvic, Matthew Komelski.
- \$5,000 Virginia Tech Institute for Distance and Distributed Learning grant for further development of an online distance learning system based on *Interactive Taiji* for teaching Taiji. Research team: Ivica Ico Bukvic, Matthew Komelski.

## 2010

- \$3,000 supplemental Education Enhancement Grant for the *Interactive Taiji* Education Enhancement grant (EECG) sponsored by the Virginia Tech Arts Initiative. Includes compensation for one graduate assistant (Matthew Komelski) and one undergraduate student researcher. Research team: Ivica Ico Bukvic, Isabel Bradburn.

## 2009

- \$5,000 Virginia Tech Institute for Distance and Distributed Learning grant for the development of an online distance learning system based on *Interactive Taiji* for teaching Taiji. Research team: Ivica Ico Bukvic, Isabel Bradburn, and Matthew Komelski.
- \$20,000 Virginia Tech Institute for Society, Culture and Environment (ISCE) summer scholars grant for the establishing of the *Linux Laptop Orchestra* (L2Ork). Sponsored summer undergraduate student assistantships. As part of the Research Experience for Undergraduates (REU) CS department program also engaged three undergraduate students, including one visiting student from Rochester. Research team: Ivica Ico Bukvic, Tom Martin.

- \$2,303 Virginia Tech Vice President of Information Technology grant for the purchase of MSI Wind netbooks for the *Linux Laptop Orchestra* (L2Ork). Research team: Ivica Ico Bukvic, Tom Martin.
- \$930 Virginia Tech School of Performing Arts & Cinema (SOPAC) grant for sponsoring a visit of a Hungarian artist Tibor Varszegi for the spring DISIS event theatrical multimedia piece production in collaboration with College of Liberal Arts & Human Sciences (CLAHS) Dean Sue Ott Rowlands.

## 2008

- \$5,000 *Interactive Taiji* Education Enhancement grant (EECG) sponsored by the Virginia Tech Arts Initiative. Includes compensation for one graduate assistant (Matthew Komelski) and one undergraduate student researcher (Sabrina Killian). Research team: Ivica Ico Bukvic, Isabel Bradburn, Denis Gracanin, Kelly Parkes.
- \$10,000 *Sustainable, Intelligent Environment for Communal Interaction with Art and Culture* phase II grant by Virginia Tech Institute for Society, Culture, and Environment (ISCE) and Institute for Critical Technology and Applied Science (ICTAS), dealing with physical prototyping of installation modules proposed in phase I. Research team: Ivica Ico Bukvic, Dan Fogel (Wake Forest).

## 2007

- \$400 Virginia Tech Center for Instructional Development and Educational Research (CIDER, formerly known as CEUT) Faculty Study Group (FSG) grant for an interdisciplinary collaboration study group involving College of Engineering, College of Architecture and Urban Studies (CAUS), and College of Liberal Arts & Human Sciences (CLAHS).
- \$500 Virginia Tech *Collaborative for Creative Technologies in the Arts and Design* (CCTAD) and the Department of Music matching grant for the Soundtrack and Effects Composition course field trip and recording session in Williamsburg, Virginia.
- \$20,000 Institute for Society, Culture and Environment (ISCE) summer scholars grant for the Science and Mathematics Inclusive Learning and Engagement (SMILE) study. Sponsored four undergraduate music assistantships for a total of \$1,000. Research team: Carlos Evia, Ivica Bukvic.
- \$2,400 Science and Mathematics Inclusive Learning and Engagement (SMILE) project collaborator on preliminary research. Research team: Carlos Evia, Tonya Lynette Smith Jackson, Ivica Ico Bukvic.
- Est. \$25,000 Virginia Tech Stakeholders Project. Generation of promotional materials and multimedia content for the purpose of raising \$29M for the new Performing Arts Center. Sponsored two student undergraduate music assistantships. Research team: Dane Webster, Ivica Bukvic.
- \$20,000 Institute for Society, Culture and Environment (ISCE) summer scholars grant for the pilot study utilizing Aural Matrix Haptic Display Interface. Sponsored two summer undergraduate music student assistantships for a total of \$3,200. As part of the Research Experience for Undergraduates (REU) Computer Science (CS) department program also engaged a visiting undergraduate CS student from Oberlin College. Research team: Ivica Ico Bukvic, Denis Gracanin, Francis Quek.

## 2006

- \$1,200 Virginia Tech *Collaborative for Creative Technologies in the Arts and Design* (CCTAD) branding project sponsored by CCTAD and the School of Visual Arts (SOVA). Design of audio-visual branding materials for CCTAD including website and other promotional materials. Oversight of four CCTAD GTAs.
- \$500 Virginia Tech College of Liberal Arts & Human Sciences (CLAHS) grant writing workshop participant.
- \$12,500 Virginia Tech *Collaborative for Creative Technologies in the Arts and Design* (CCTAD) complementing grant for DISIS development.

- \$45,000 Virginia Tech *Collaborative for Creative Technologies in the Arts and Design (CCTAD)*/Digital Arts Research Collective (DARC) equipment grant proposal to the School of Visual Arts. Research team: Truman Capone, Ivica Ico Bukvic, Simone Paterson, Dane Webster.
- \$32,000 Virginia Tech College of Liberal Arts & Human Sciences (CLAHS) Dean equipment grant for Aural Matrix Haptic Display Interface exploratory research involving CHCI, Engineering, Assistive Technology and Music Technology. Research team: Ivica Ico Bukvic, Francis Quek, Tom Martin, William Holbach, Michael Dunston.
- \$300 Virginia Tech Center for Instructional Development and Educational Research (CIDER, formerly known as CEUT) Faculty Study Group (FSG) grant for an interdisciplinary collaboration study group involving College of Engineering, Architecture, College of Liberal Arts & Human Sciences (CLAHS), and Music.
- \$3,000 College of Liberal Arts & Human Sciences (CLAHS) Faculty Research Grant for producing commissioned multimedia interactive work.

## PUBLICATIONS

Digital copies of select papers available at <http://ico.bukvic.net/main/publications/>

- Bukvic, I. (2016). How to Conduct an Orchestra without Musical Instruments. *illumiNation*. Virginia Tech College of Liberal Arts and Human Sciences, vol. 1 (2016-7).
- Dredger, K., Wyatt, A., Cowden, T., Bukvic, I., & Parkes, K. (2017). OPERAcraft: Intersections of creative narrative, music, and video games. In Corbett, S., Decker, T.E., & Cooper, B. (Eds). *Writing in the Performing and Visual Arts: Creating, Performing, and Teaching*. WAC Clearinghouse.
- Bukvic, I., Wilkes, J., & Gräf, A. (2016). Latest developments with Pd-L2Ork and its Development Branch Purr-Data. PdCon 2016. New York, NY.
- McPherson, A., Berdahl, E., Jensenius, A., Lyons, M., Bukvic, I., & Knudsen, A. (2016). NIMEhub: Toward a Repository for Sharing and Archiving Instrument Designs. *New Interfaces for Music Expression* (pp. pending). Brisbane, Australia: NIME.
- Bukvic, I. (2016). D4: an Interactive 3D Audio Rapid Prototyping and Transportable Rendering Environment Using High Density Loudspeaker Arrays. *International Computer Music Conference*. Utrecht, Netherlands.
- Bukvic, I. (2016). 3D TIME-BASED AURAL DATA REPRESENTATION USING D4 LIBRARY'S LAYER BASED AMPLITUDE PANNING ALGORITHM. *International Conference on Auditory Displays*. Canberra, Australia.
- Bukvic, I., and \*Matthews M. (2015). AEGIS AUDIO ENGINE: INTEGRATING A REAL-TIME ANALOG SIGNAL PROCESSING, PATTERN RECOGNITION, AND A PROCEDURAL SOUNDTRACK IN A LIVE TWELVE-PERFORMER SPECTACLE WITH CROWD PARTICIPATION. *International Conference on Auditory Displays* (pp. 35-43). Graz, Austria: IEM.
- Nicholas F. Polys, Knapp, B., Bock, M., Lidwin, C., Webster, D., Waggoner, N., and Bukvic, I. (2015). Fusality: an open framework for cross-platform mirror world installations. *20th International Conference on 3D Web Technology (Web3D '15)* (pp. 171-179). ACM, New York, NY, USA.
- Bukvic, I., \*Cahoon, C., Wyatt, A., Cowden, T., Dredger, K. (2014). OPERAcraft: Blurring the Lines between Real and Virtual. *International Computer Music Conference*, Athens, Greece.
- Bukvic, I. (2014). Pd-L2Ork Raspberry Pi Toolkit as a Comprehensive Arduino Alternative in K-12 and Production Scenarios. *New Interfaces for Music Expression* (pp. 163-6). London, UK: NIME.

- Bortz, B., Ishida, A., Bukvic, I., & Knapp, B. (2013). *Lantern Field: Exploring Participatory Design of a Communal, Spatially Responsive Installation*. *New Interfaces for Music Expression* (pp. pending). Seoul, Korea: NIME.
- Sawyer, B., Forsyth, J., \*O'Connor, T., Bortz, B., Finn, T., Baum, L., Bukvic, I., Knapp, B., & Webster D. (2013). *Form, function and performances in a musical instrument MAKERS camp*. *ACM Special Interest Group on Computer Science Education* (pp. 669-674). Denver, Colorado: ACM.
- Bukvic, I., Baum, L., \*Layman, B., & \*Kendall, W. (2012). *Granular Learning Objects for Instrument Design and Collaborative Performance in K-12 Education*. *New Interfaces for Music Expression* (pp. 344-346). Ann Arbor, Michigan: NIME.
- Bukvic, I. (2012, May). *Reunion*. *ICTAS Connection*, Virginia Tech, 11. Retrieved from <http://www.ictas.vt.edu/communication/pdf/conn11.pdf>
- Bukvic, I. (2012). *A Behind-the-Scenes Peek at World's First Linux-Based Laptop Orchestra – The Design of L2Ork Infrastructure and Lessons Learned*. *Linux Audio Conference* (pp. 55-60). Stanford, California.
- Bukvic, I. & Komelski, Matthew. (2012). *Strategies for Structured \*Ork Performance Choreography: Integrating Taiji Martial Arts into L2Ork Repertoire*. *Symposium for Laptop Ensembles and Orchestras* (pp. 51-53). Baton Rouge, Louisiana.
- Bukvic, I., S. Betz. (2011). "USING GAMING ENGINE FOR VIRTUAL PROTOTYPING AND IMPACT ASSESSMENT OF COMPLEX INTERACTIVE ART INSTALLATIONS." *International Computer Music Conference*, Huddersfield, United Kingdom.
- *iteration13* published as part of the 2010 International Computer Music Conference DVD, Spring 2011.
- Bukvic, I., T. Martin and \*Michael Matthews. (2011). "Moving Beyond Academia Through Open Source Solutions—Introducing L2Ork, Virginia Tech's *Linux Laptop Orchestra*." *Society for Electro-Acoustic Music in the United States* conference, Miami, Florida.
- Bukvic, I., T. Martin, E. Standley and \*Michael Matthews. (2010). "Introducing L2Ork: *Linux Laptop Orchestra*." *New Interfaces for Music Expression* conference, Sydney, Australia.
- Bukvic, I. and \*Ji-Sun Kim. (2010). "PERCEPTION AND INTERPRETATION OF CONCURRENT AURAL SHAPES USING DREAM INTERFACE." *International Computer Music Conference*, Stony Brook, New York.
- *FORGETFULNESS* published on the *New River Journal*, oldest online journal of new media in the United States. Available at <http://www.cddc.vt.edu/journals/newriver/09Spring/index.html>, May 1, 2010.
- Bukvic, I. and Ji-Sun Kim. (2009). "μ MAX-UNITY3D INTEROPERABILITY TOOLKIT." *International Computer Music Conference*, Montreal, Canada, 375-378.
- Hussein, K., E. Tilevich, I. Bukvic and SooBeen Kim. (2009). "Sonification design guidelines to enhance program comprehension." *IEEE's International Conference on Program Comprehension*, Vancouver, Canada, 120-129.
- Bukvic, I., D. Gracanin and F. Quek. (2008). "INVESTIGATING ARTISTIC POTENTIAL OF THE DREAM INTERFACE: THE AURAL PAINTING." *International Computer Music Conference*, Belfast, United Kingdom.
- Bukvic, I., J. Kim, D. Trueman and T. Grill. (2007). "munger1~: TOWARDS A CROSS-PLATFORM SWISS-ARMY KNIFE OF REAL-TIME GRANULAR SYNTHESIS." *International Computer Music Conference*, Copenhagen, Denmark.
- Bukvic, I. (2007). "iCulture." *Vennue*, Roanoke, Virginia, Blackmediagroup, 1.

- *All Your Sprache Are Belong to Strauss* featured on the SEAMUS 20<sup>th</sup> Anniversary Electroclips CD, Fall 2006.
- Bukvic, I. (2005). "Made in Linux — The Next Step," *Linux Audio Conference* proceedings, Karlsruhe, Germany.
- Bukvic, I. (2005). "The 0<sup>th</sup> Sound." published in proceedings for the SPARK festival, Minnesota.
- Bukvic, I. (2005). "Tabula rasa," (D.M.A. Dissertation) *Ohiolink*. Available at <http://www.ohiolink.edu/etd/view.cgi?acc%5Fnum=ucin1131065629>.
- CD review (Eric Chasalow's *Left to His Own Devices*) published in the printed edition of *Array*, ICMA's *Array* magazine, 2005.
- Bukvic, I. (2004). "Linux as a Mature Digital Audio Workstation in Academic Electroacoustic Studios – Is Linux Ready for Prime Time." *Proceedings of the International Computer Music Conference*, Miami, Florida.
- Helmuth, M., I. Bukvic, M. Schedel, J. Bernard. (2004). "University of Cincinnati, College-Conservatory of Music Center for Computer Music - (CCM)<sup>2</sup> in 2004." (co-author) *International Computer Music Conference*, Miami, Florida.
- "RTMix – towards a standardized interactive electroacoustic art performance interface." *Organised Sound* Vol.7 No.3 (December 2002), 275-286.
- Bukvic, I. (2002). "Making Interactive Electroacoustic Music with Computer through the Use of RTMix - a Real-Time Interactive Electroacoustic Music Performance, Composition, and Coaching Interface." *WSEAS International Conference on Electronics, Control & Signal Processing*, Singapore.
- *ICMC 2002* concert review published in the *Array*, ICMA's online magazine. Available at <http://www.computermusic.org/array.php?artid=95>.
- Bukvic, I. (2002). "RTMix: a Real-Time Interactive Electroacoustic Music Performance, Composition, and Coaching Interface." *Proceedings of the International Computer Music Conference*, 79-82.
- "MIDI and Art Music – an Aesthetic Comparison." *M-Station* online magazine (available at <http://mstation.org>), 2002.
- Bukvic, I. (2000). "SlipStreamScapes\* III: The Sea," (Master of Music Thesis) *Ohiolink*. Available at <http://www.ohiolink.edu/etd/view.cgi?ucin984494016>.

## PRESENTATIONS & KEYNOTES

- Rapid Prototyping in Music, Maker, and Robotics Scenarios using Raspberry Pi and Pd-L2Ork K12 Module, invited workshop, Brooklyn College, Brooklyn, New York, November 19, 2016.
- Rapid Prototyping in Music, Maker, and Robotics Scenarios using Raspberry Pi and Pd-L2Ork K12 Module, peer-reviewed workshop, PdCon 2016, Stevens Institute of Technology, Newark, New Jersey, November 17, 2016.
- Spatial Audio: The Last Frontier, invited visiting lecture, Steinhardt University, New York, New York, November 17, 2016.
- Rapid Prototyping in Music, Maker, and Robotics Scenarios using Raspberry Pi and Pd-L2Ork K12 Module, invited workshop, New York University, New York, New York, November 16, 2016.
- Introducing D4: An Interactive 3D Audio Rapid Prototyping and Transportable Rendering Environment Using High Density Loudspeaker Arrays, peer-reviewed workshop, International Computer Music Conference, Utrecht, Netherlands, September 15, 2016.



- Layer-Based Amplitude Panning, peer-reviewed workshop, International Conference on Auditory Displays, Canberra, Australia, July 6, 2016.
- Designing Synthesizers with Pd-L2Ork, invited workshop, Moogfest, Durham, May 21, 2016.
- Interactive Spatialization of Sound, invited lecture, Moogfest, Durham, NC, May 20, 2016.
- Baum, L., Martin, T., Bukvic, I., Zacharias, K. "A Scientist, an Engineer, an Artist, and a Designer Walked Into a Bar: An SEAD of a Story," T-Summit, Washington D.C, March 21, 2016.
- Bukvic, I., Martin, T., Baum, L. L2Ork A2RU Exemplar presentation and critique, Alliance for Arts in Research Universities (A2RU) 2015 National Conference, A2RU, Blacksburg, Virginia. November 10, 2015.
- Wisnioski, M. (Chair), Bukvic, I. (Co-presenter), Martin, T. (Co-presenter), Baum, L. (Co-presenter), Zacharias, K. (Co-presenter), "Coordinating the Dance between Research, Infrastructures, and Arts Practices," Alliance for Arts in Research Universities (A2RU) 2014 National Conference, A2RU, Ames, IA. November 5, 2014.
- **Keynote** speaker and workshop presenter for the 14th Brazilian Symposium on Computer Music, Brasilia, Brazil. October 31-November 2, 2013.
- Workshop on building your own Linux Laptop Orchestra (L2Ork) at Hogeschool vor de Kunsten Utrecht, Utrecht, Netherlands. May 26, 2011.
- Workshop on building your own Linux Laptop Orchestra (L2Ork) at STEIM, Amsterdam, Netherlands (<http://www.steim.org/steim/events.php?event=411>). May 24, 2011.
- Workshop on building your own Linux Laptop Orchestra (L2Ork) at Art Meets Radical Openness (LiWoLi) festival, Kunstuniversität Linz, Austria (<http://www.liwoli.at/vortragende/l2ork>). May 14, 2011.
- **TEDxMidAtlantic**; a talk with the theme being "the power of stories", Baltimore, Maryland, November 5, 2009.
- Bukvic, I. "libALSA, libJACK,... lib-what? I Just Want To Do My Work." **Keynote** at the 25th Tonmeistertagung conference, Leipzig, Germany, 274-277, November 13-16, 2008.
- "The Art of Composer and Multimedia Sculptor." *50 years of Computing Conference*, Cincinnati, Ohio, Fall 2008.
- "Communal Performance Art through Technology: A Study of 'Soul' Composition for Baritone, Computer, and Audience." *College Music Society National Conference*, Atlanta, Georgia, Fall 2008.
- *Wake-Forest Intelligent Sustainable Space Multimedia Installation Project* (Phase I PI) prototype showcase as part of the Workplace Strategies booth at the University of North Carolina Greensboro's *Design, Art and Technology Symposium*, Spring 2008.
- *New Music Festival* guest speaker, UNC Greensboro, November 2007.
- "Complementing Traditional Performance Idiom with Contemporary Technology—A Study of *SlipStreamScapes V: Lullaby* Electroacoustic Piece for Two Pianos and Interactive Computer." *College Music Society National Conference*, Salt Lake City, Utah, Fall 2007.
- "Pebble Space: An Intelligent Communal and Collaborative Space." Interactive multimedia installation proposal to the Wake Forest partners for the new downtown Charlotte seven building construction project, Fall 2007.
- "Integrating Documentation, End-User Support, and Developer Resources using \*.linuxaudio.org." *Linux Audio Conference* at TU Berlin, Germany, Spring 2007.
- "The Genius of the Place: Land and Identity in Contemporary Art" visiting lecturer for the exhibition at the Arts Museum of Western Virginia, Roanoke, Virginia, November 2006.

- *mama.mi2.hr* visiting lecturer at the *mama.mi2.hr* contemporary multimedia institute in Zagreb, Croatia, Summer 2006.
- "Linuxaudio.org — Who, What, and Why?" *Linux Audio Conference* in Karlsruhe, Germany, Spring 2006.
- "Practical Guide to Interactive Electroacoustic Art." *SEAMUS 2005 Conference*, Ball State University, IN, Spring 2005.
- Panel member by invitation on the topic "Standards From the Computer Music Community." *International Computer Music Conference 2004*, Miami, Florida, Summer 2004.
- *Workshops in Electronic and Computer Music* visiting lecturer, Oberlin College, Summer 2004.
- Panel member by invitation on the topic "Future of Linux Audio." *Linux Audio Conference* in Karlsruhe, Germany, Spring 2004.
- "Unlocking the Full Potential of RTMix real-time interactive multimedia Art Performance, Composition, and Coaching Interface," *Linux Audio Conference* in Karlsruhe, Germany, Spring 2004.
- "Hurdles and Benefits of Introducing Linux as a Viable Digital Audio Workstation in the Academic Environment," *Linux Audio Developer conference* in Karlsruhe, Germany, Spring 2004.
- "RTMix — a Real-Time Interactive Multimedia Art Performance, Composition, and Coaching Interface," *SEAMUS 2003 Conference*, Tempe, AZ, Spring 2003.
- "Stochastic Phrase and Density Structure Generator (SPIDSiG) Music Software," *SEAMUS 2002 Conference*, Iowa City, IA, Spring 2002.

## SELECTED WORKS

A complete list of performances and links to select media are available at <http://ico.bukvic.net/main/works/>

- *An Ending (Ascent)* – an arrangement of Brian Eno's composition for the *Raspberry Pi Orchestra*, 2016. (4')
- *L2Orkin'Around* – a crowd-sourced composition for a woman rapper and the *Raspberry Pi Orchestra*, 2016. (3')
- *Rain* – composition for horn and the *Linux Laptop Orchestra (L2Ork)*, 2015. (10')
- *Tornado* – real-time simulation of a tornado designed specifically for the Institute for Creativity, Arts, and Technology's (ICAT) Cube audio system with 128-channel sound diffusion (with contributed recordings from Jim Metzner and Sergio Nunez), 2014. (2')
- *Cloud* – interactive community-driven audio-visual installation with 50 community-programmed Raspberry Pis (in collaboration with Aki Ishida), 2013-2014.
- *Dust* – for Kandinsky Trio, 2014. (4')
- *Constellation* – an interactive audio-visual installation/demo for the Institute for Creativity, Arts, and Technology's (ICAT) Perform studio, Fall 2013.
- *Between* – composition for the *Linux Laptop Orchestra (L2Ork)*, 2013. (10')
- *Interactive Lantern Field* – interactive audio-visual installation (in collaboration with Aki Ishida, Benjamin Knapp, and Brennon Bortz), 2013.
- *Kite Lanterns* – interactive aural installation (in collaboration with Aki Ishida, Benjamin Knapp, and Brennon Bortz), 2012.

- *Kinesthesia* – interactive telematic aural installation (in collaboration with NOVARS research centre, Manchester University), Manchester, United Kingdom, 2012.
- *Rain* – composition for the *Linux Laptop Orchestra* (L2Ork), 2011. (10')
- *Serene* – composition for the *Linux Laptop Orchestra* (L2Ork), 2011. (9')
- *13* – structured improvisation for the *Linux Laptop Orchestra* (L2Ork) and percussion, 2010. (9')
- *What's He Building?* – an arrangement of Tom Waits' piece for *Linux Laptop Orchestra* (L2Ork) and narrator, 2010. (6')
- *Citadel* – composition for the *Linux Laptop Orchestra* (L2Ork) and soprano, 2009. (6')
- *Half-Life* – composition for the *Linux Laptop Orchestra* (L2Ork) and narrator, 2009.
- *Singing Darwin* – aural installation using hemispherical speaker and self-generating aural fabric, 2009.
- *NUPUY* – a physical wall sculpture (a.k.a. ambient art) populated with interactive system that combines aural soundscapes with information commissioned by Virginia Tech ICTAS, 2009-present.
- *Mind-Body Interactive* (a.k.a. *Interactive Taiji*) – dynamic/evolving soundtrack for the *Interactive Taiji* research pilot, 2009.
- *FORGETFULNESS* – interactive audio-visual setting of a poem by Denise Duhamel, 2009.
- *17* – interactive audio-visual theatre for a solo performer, computer, and visuals, 2008-9. (50')
- *Elemental and Cyrene Reefs* – commissioned works for the DARC exhibit at the new Taubman Museum of Art in Roanoke, Virginia, 2008.
- *derelicts of time* – interactive audio-visual work for trombone and computer, 2008. (10')
- *iteration 13* – interactive audio-visual work for tap dancer, visual artist, audio-visual hyperinstrument and computer, 2008. (13')
- *air.crane.moo.latte.runway* – interactive audio-visual work for an actor, computer and video, 2008. (10')
- *heads will roll* – interactive multimedia installation/game, 2007.
- *with delicate risk* – audio-visual work, 2007. (3')
- *TWISTS* – "Reconsidering Nuclear Power" an evening-long play by Theatre Workshop in Science, Technology and Society. (60')
- *Pandora* – for laptop, visuals, quad audio and motion-based gestural hyperinstrument, 2007. (5')
- *Soul* – for baritone and laptop, based on a poem by Emily Dickinson, 2007. (5')
- *Gaudeamus* – for woodwind nonet, 2006. (5')
- *Structured Improvisation I – Chalybs* – for laptop, 2006. (7')
- *All Your Sprache are Belong to Strauss* – for tape, 2006. (2')
- *Symmetries* – for 8-channel computer, violin, and hyperinstrument, 2005. (10')
- *Borealis* Linux Desktop Sound Theme – collection of freely downloadable desktop sounds, 2004.
- *Legisonitus #1 – Gone in 8 Minutes and 11.527 Seconds* – for tape, 2004.
- *Tabula rasa* – DISSERTATION work for flute, cello, piano, and computer, 2004. (14')
- *Out of Doors Suite Part 2* – audio-visual composition created using Adobe Flash, 2003. (4')
- *What Happened* – intermedia project involving video, animation, and audio, 2003. (4')

- *Synaesthesia* – endless ever-changing aural installation in Adobe Flash format, 2003.
- *Jadran poslije kiše* – for solo cello, 2003. (4')
- *Imitation Crabmeat Rag* – an interactive 4-channel electroacoustic work for a live performer and
- *SlipStreamScapes V: Lullaby* – an interactive electroacoustic work for 2 pianos and a computer, 2002. (9')
- *Mr. Ping* – for tape, 2001. (7')
- *SlipStreamScapes III: The Sea* – interactive work for a solo guitar and computer in 5 movements, 2000. (28')
- *SlipStreamScapes II: Visions* – for flute, bassoon, trumpet, piano, and marimba, 1999. (6')
- *Polaris* – for tape, 2000. (9')
- *String Quartet No.2 "Croatian Anthem"*, 1998, revised 2003. (8')
- *SlipStreamScapes I : Ruins* for mezzo and stereo tape, 1998, revised 2005. (9')
- *Nebulae* – for 5 oboes, 1997.
- *Sziget* – for SSAATTBB a capella choir, solo boy soprano, and percussion, 1997. (13')
- *Moonwaltz* – for solo piano, 1994. (5')

## COMMISSIONS

- *Unnamed* (2016) for piano and Linux Laptop Orchestra (L2Ork) by Richard Masters.
- *Rain* (2015) for horn and Linux Laptop Orchestra (L2Ork) by Wallace Easter.
- *Infinity* (1992) digital soundtrack licensed for use in a "24 Sata" car review magazine for a video review. 2014. [www.24sata.hr/auto/pogledajte-video-test-nissan-navare-25-dci-king-cab-4x4-381744](http://www.24sata.hr/auto/pogledajte-video-test-nissan-navare-25-dci-king-cab-4x4-381744)
- *Cloud* audio-visual community-driven installation by Ballston Business Improvement District in collaboration with Aki Ishida. Fall 2013-Fall 2014.
- *Dust* for Kandinsky Trio. May 2014.
- *Interactive Lantern Field* audio-visual installation by Smithsonian Foundation in collaboration with Aki Ishida, Benjamin Knapp, and Brennon Bortz. April, 2013.
- *Between* for Linux Laptop Orchestra by Temple University's Vice Provost for the Arts, 2013.
- *Kite Lanterns* interactive aural installation by American Institute of Architects in collaboration with Aki Ishida, Benjamin Knapp, and Brennon Bortz. September 14, 2012.
- *Virginia Tech ICTAS* interactive aural sculpture installation (permanent exhibit) in collaboration with sculptor Prof. Steve Bickley. November 3, 2009.
- *callitwhatchawant* for the Virginia Tech TWISTS *Living Darwin* play. October 7, 2009.
- *Borealis* desktop sound theme licensed by Fididel Inc. (<http://www.fididel.com/index.php>). March 2, 2009.
- SUN Microsystems sound theme for Open Solaris. Fall 2008.
- TWISTS soundtrack for online podcasts. Fall 2008.
- *17* a collaboration with Sue Ott Rowlands and Tibor Varszegi on a theatrical multimedia play, Romania. Fall 2008.

- *derelicts of time* by Jay Crone, project in part sponsored by the CLAHS creative grant. Spring 2008.
- *TWISTS* "Nuclear Power Reconsidered" theatrical play. Fall 2007.
- *Soul* for computer and voice by Theodore Sipes. 2007.
- VT Stakeholders Project soundtrack, effects, and interactivity for the design of multimedia fund-raising materials. 2007.
- *FreeCol* soundtrack <http://www.freecol.org>. 2007.
- *Gaudeamus* by Virginia Tech Graduate School. 2006.
- *Borealis* expansion of the sound theme by Gregoire Gentil (for an undisclosed software project). 2006.
- *Symmetries* by violinist Anna Zielinska. 2005.
- *Tabula rasa* by NeXT Ens contemporary ensemble. 2004.
- *SlipStreamScapes V: Lullaby* by pianist Michael Fowler. 2002.

## AWARDS AND RECOGNITION

- L2Ork selected by peer review as one of the six transdisciplinary [exemplars](#) among member A2RU research universities, including top 30 institutions with transdisciplinary initiatives in the United States, September 4, 2015.
- April 21, 2015: *OPERAcraft* featured in the USA Today writer Greg Toppo's book [The Game Believes in You: How Digital Play Can Make Our Kids Smarter](#).
- DCist.com (November 8, 2014). The Washington DC-based news blog listed Linux Laptop Orchestra (L2Ork) as one of the "eight awesome research projects at Virginia Tech." Retrieved February 9, 2015, from [http://dcist.com/2014/11/8\\_awesome\\_research\\_projects\\_at\\_virg.php](http://dcist.com/2014/11/8_awesome_research_projects_at_virg.php)
- Nominated (by Institute for Creativity, Arts, and Technology's Director Dr. Benjamin Knapp) and selected for Virginia Tech Management Academy, Summer 2014.
- Special Citation for Community Engagement with Lighting - Lantern Field, Architectural Lighting. August 13, 2013. Retrieved March 23, 2013 from <http://www.archlighting.com/cultural-projects/special-citation-for-community-engagement-with-li.aspx>
- Winner of the Newblankets Inc. Satchmo SuitSup Award for work on pd-l2ork and L2Ork, October 14, 2012.
- Teacher of the Week, Center for Instructional Development and Educational Research, October 17-23, 2011.
- Virginia Tech Scholar of the week, August 29-September 4, 2011.
- 1<sup>st</sup> place in the first international laptop orchestra commission competition for the revamped version of *Half-Life* composition with added choreography for *Linux Laptop Orchestra* (L2Ork) and narrator organized by Electric Monster Laptop Ensemble at Montana State University, February 18, 2011.
- Winner of 2010-11 Virginia Tech College of Liberal Arts & Human Sciences Excellence in Research and Creative Scholarship award, February 4, 2011.
- Virginia Tech *Linux Laptop Orchestra* (L2Ork) featured on the front cover of the international *Linux Journal*. The magazine also includes eight-page coverage of the ensemble and an interview, April 3, 2010. Phillips, D. (2010). State of the Art: Linux Audio 2008. [Linux Journal](#). Champlain, NY, HME Publishing Limited: 193 50-57.

- Recipient of the Virginia Tech XCaliber award for "for exceptional, high caliber contributions to technology-enriched teaching and learning", March 5, 2010.
- Invited to give talk at the inaugural TEDxMidAtlantic conference with the theme being "the power of stories," Baltimore, MD, November 5, 2009. Retrieved February 17, 2015 from [https://www.youtube.com/watch?v=IPvd\\_d\\_baNw](https://www.youtube.com/watch?v=IPvd_d_baNw)
- *with delicate risk* audio-visual work (in collaboration with visual artist Dane Webster) was recognized as part of the 2009 Best Animated Short category award at the *Frozen Film Festival*, San Francisco, CA, July 9, 2009. Retrieved February 17, 2015, from <http://www.frozenfilmfestival.com/pages/lineup09.php>
- Recipient of the Creative Achievement Award from VT CAUS for the *Revo:overR* interactive multimedia installation exhibit, April 21, 2009.
- Courtesy appointment in Computer Science, Fall 2007-present.
- Courtesy appointment in School of Visual Arts, Fall 2007-2010.
- *All Your Sprache Are Belong to Strauss* voted winner of the 20<sup>th</sup> anniversary Electroclips composition contest sponsored by the *Society for Electro-Acoustic Music in the United States (SEAMUS)*, Spring, 2006.
- First Artist Member of the Virginia Tech's Center for Human Computer Interaction (CHCI), 2006-present.
- Elected Director of the international Linux Audio Consortium, 2005-present.
- Winner of the national graduate student award by the Croatia's National Ministry of Science, Education, and Sports, 2004.
- Author of *Borealis*, the most downloaded and one of the most popular desktop sound themes on [kde-look.org](http://kde-look.org), 2004.
- *Upbeat* composition competition winner, Croatia, Hvar, 2003.
- *Presser Music Award* finalist, University of Cincinnati, College-Conservatory of Music, 2003.
- *RTMix* software featured by the Stanford and Eastman electroacoustic studios, 2003.
- Summer Graduate Scholarship, University of Cincinnati, College-Conservatory of Music, 1999, 2000, 2003.
- Graduate Assistantship Award, University of Cincinnati, College-Conservatory of Music, 1999-2003.
- *Sigma Alpha Iota* composer competition winner, Cincinnati, OH, 1998.
- University Honors Scholarship, University of Cincinnati, College-Conservatory of Music, 1993-1998.
- Second place in the National Pascal programming competition, Zagreb, Croatia, 1992.



A complete list of media coverage available at <http://ico.bukvic.net/main/press/>

## GUEST LECTURES & PANELS

The logo features a black square with a white letter 'G' inside, followed by the text 'UEST LECTURES & PANELS' in a bold, black, sans-serif font.

- Presentation to the CS 4624: Multimedia, Hypertext and Information Access course covering interactive multimedia; Virginia Tech, 2014-6.

- Presentation in the Human-Centered Design weekly seminar series discussing opportunities and challenges of a transdisciplinary, Virginia Tech, September 26, 2016.
- Floyd Art Dialogues; discussing the future of music through technology; Floyd, Virginia, November 21, 2014.
- A2RU National Conference; panel member discussing OPERAcraft; Iowa State University, Ames, Iowa, November 5, 2014.
- Virginia Tech; presentation to the Pulaski County K-12 Teachers and Administration to facilitate ongoing and spawn new collaborations with K-12 regional education sector; October 27, 2014.
- A2RU Emerging Creatives Student Conference; panel member discussing arts in research one institutions; Stanford University, Stanford, California, February 1, 2014.
- Drexel University ExCITE Center; guest lecturer discussing Linux Laptop Orchestra (L2Ork); Philadelphia, Pennsylvania, April 18, 2013.
- Temple University; guest lecturer discussing Linux Laptop Orchestra (L2Ork); Philadelphia, Pennsylvania, April 17, 2013.
- Freer Gallery, Smithsonian; guest lecturer discussing Interactive Lantern Field; Washington, DC, April 6, 2013.
- Community College of Philadelphia; guest lecturer discussing Linux Laptop Orchestra (L2Ork); Philadelphia, Pennsylvania, February 21, 2012.
- Texas A&M; three lectures discussing own creative work; College Station, Texas, November 2, 2011.
- IRCAM; seminar discussing Linux Laptop Orchestra (L2Ork), Paris, France, May 30, 2011.
- Montreal Pd users meeting; guest speaker covering pd-l2ork software; Montreal, Canada, May 7, 2011.
- Center for Human-Computer Interaction seminar; *Bring back the STEAM* presentation; Virginia Tech, April 22, 2011.
- CPATH NSF-funded workshop; guest speaker on Music and Computing; Wake-Forest University, Winston-Salem, Virginia, April 2, 2011.
- MUSICACOUSTICA 2010 international music festival; guest speaker discussing *Linux Laptop Orchestra* (L2Ork); Beijing, China, October 28, 2010.
- Virginia Tech Roanoke center; guest lecturer discussing *Linux Laptop Orchestra* (L2Ork); October 22, 2010.
- Louisiana State University; guest lecturer discussing own creative work; Baton Rouge, Louisiana, April 26-27, 2010.
- *Biomusical Engineering* (UH-3004H); guest lecturer at class taught by Virginia Tech Professor Emeritus Dr. Schneck discussing own research; Virginia Tech, February 17, 2010.
- College-Conservatory of Music University of Cincinnati; guest lecturer discussing own creative work, including individual composition lessons with graduate computer music students, Cincinnati, Ohio, January 19, 2010.
- Virginia Tech Summer Band Camp; lecturer in computer music for middle and high school band camp students; Blacksburg, Virginia, June 22-25, 2009.
- VT Linux and Unix Users Group (VTLUUG) student organization; lecture on free open source digital processing tools; Virginia Tech, March 2009.
- University of Virginia Colloquium series; lecture on the DREAM technology and artistic output presented as part of the; Charlottesville, Virginia, January 23, 2009.

- Taubman Museum of Art Noon Series; lecture on my contributions to the Digital Arts Research Collective's Revo:oveR exhibit; Roanoke, Virginia, January 9, 2009.
- Virginia Tech Summer Band Camp; lecturer in computer music for middle and high school band camp students; Blacksburg, Virginia, June 23-26, 2008.
- *Building Communities through the Arts* (part of the Virginia Tech Arts Initiative); discussing use of music through ambient art to enhance architectural spaces; South Boston, Virginia, June 4, 2008.
- Duke University; guest lecturer discussing own creative output; Durham, North Carolina, Spring 2008.
- Yong Siew Toh Conservatory of Music at the National University of Singapore; guest lecturer discussing own creative output; Singapore, Winter 2008.
- VT Linux and Unix Users Group (VTLUUG) student organization; lecture on free open source digital processing tools; Virginia Tech, November 2007.
- CPATH NSF-funded workshop, guest lecturer; Virginia Tech, November 2007.
- University of North Carolina Greensboro Computer Music Festival; guest lecturer; Greensboro, North Carolina, November 2007.
- "Art for Our Sake;" panel member; Virginia Tech, November 2007.
- Computer Science's Human-Computer Interaction Seminar; guest lecturer; Virginia Tech, Spring 2007.
- School of Visual Arts Time-Based Media class; guest lecturer; Virginia Tech; Winter 2007.
- Arts Museum of Western Virginia; guest lecturer for the "The Genius of the Place: Land and Identity in Contemporary Art" exhibition; Roanoke, Virginia, November 2006.
- Cyberarts class; guest lecturer; Virginia Tech, Fall 2006.
- *mama.mi2.hr* contemporary multimedia institute; guest lecturer; Zagreb, Croatia, Summer 2006.
- University of Manchester; guest lecturer; United Kingdom, Spring 2006.
- *Accent05* festival; guest lecturer; Cincinnati, Ohio, 2005.
- *Workshops in Electronic and Computer Music*; guest lecturer; Oberlin College, Oberlin, Ohio, 2004.
- *Accent04* festival; guest lecturer; Cincinnati, Ohio, 2004.
- *Uzmah* festival; guest lecturer; Hvar, Croatia, 2003.

## SERVICE

- National Science Foundation's Research Experience for Undergraduates (CS, CHCI) mentor, 2007-2009.
- VT Linux and Unix Users Group (VTLUUG) student organization mentor, 2007-2009.

## COMMITTEES

- Member of the SEAMUS Conference Committee (by invitation), 2004-2006.
- Member of the CEUT interdisciplinary design group (by invitation), 2006-2007.
- Institute for Society, Culture and Environment (ISCE) visioning panel, 2007.
- School of Performing Arts and Cinema working group, 2008.



- Information Technology 2020 Visioning Task Force, 2010-11.
- Search committee (English, Creative Technologies), 2011-12.
- Martin Luther King Virginia Tech program organizing committee, 2012.
- Mindfulness Conference steering committee member, 2012-13.
- Search committee chair (Music Technology), 2012-13.
- ICAT Science, Engineering, Arts, and Design (SEAD) request for proposals, 2012-present.
- Personnel committee (Department of Music), 2012-14.
- Contemplative Practice for a Technological Society, 2013.
- Executive Committee Member of the new Human-Centered Design PhD program, 2014-present.
- A2RU/XSEAD Peer Review Task Force member by invitation, 2014-15.
- Center for Human-Computer Interaction executive committee member, 2015-2017.
- A2RU Third Space Committee member by invitation, 2016-present.
- A2RU Research Committee member by nomination, 2016-present.

## REVIEW PANELS

- Paper reviewer for the *Linux Audio Conference*, 2005-present.
- Paper and multimedia performance reviewer for the *International Computer Music Conference*, 2007, 2010-present.
- Paper and performance submission reviewer for the *New Interfaces for Music Expression* conference, 2010-present.
- Paper reviewer (by Professor Emeritus Daniel Schneck) for the *Journal of Biomusical Engineering*, March, 2011.
- Paper reviewer for the *Pure Data Convention*, 2011, 2016.
- Paper reviewer for the *Journal of Human-Computer Studies*, 2013.
- Paper reviewer for the *Computer Music Journal*, 2013.
- Paper reviewer for the *Divergent Press Issue #3*, 2014.
- Paper reviewer for the *Sound and Music Computing*, 2015-6.

## OTHER PROFESSIONAL EXPERIENCE

- Music Director at the St. Pius X Parish, KY, 2004-2005.
  - Spearheaded fundraising campaign, raised \$60,000 for the overhaul of the worship area audio system.
- College-Conservatory of Music, Center for Computer Music Studios (CCM)<sup>2</sup> systems administrator, 1999-2003.
- *Interactive and Experimental Music Festival* chief technician, 2002.
- College-Conservatory of Music computer systems assistant administrator, 1998.
- University of Cincinnati computer lab technician, 1997-1998.

## SOFTWARE DEVELOPMENT

Miscellaneous software development not included in the Research section, 1998-present.

- OSC-based middleware for communication between Optitrack motion tracking camera system and Max for the ICAT Perform studio.
- Ported series of externals to Pure-Data platform, including John Gibson's *spectdelay~*.
- Designed series of new externals for Pure-Data platform, including *disis\_netsend/netreceive*, *disis\_wiimote*, *disis\_phasor~*.
- A fork of *libcwiiid* designed to support Bluetooth connectivity with Nintendo Wii controllers.
- Designed free DISIS Metronome 9000, and DISIS Tuner 11 standalone applications for students and faculty.
- Contributor to *Pure-Data* and *Gem* software, including patches for the support of MSI Wind hardware.
- *disis.aka.wiiremote* Max/MSP external for interfacing with *Wii Fit* balance boards.
- *Neverball* patch allowing networked input from Max/MSP for interfacing of the *Wii Fit* balance board with the game.
- Contributions to Linux Kernel's PCMCIA and ALSA drivers.
- *Recorder9* Max/MSP abstraction for real-time audio loop recording and processing released as public domain software.
- Contributor to the Linux *Superkaramba* desktop enhancement project.

## PERFORMANCE EXPERIENCE

### HYPERINSTRUMENTS

- *Linux Laptop Orchestra* (L2Ork) 2009-present.
- Performing own works utilizing custom instruments and/or interfaces 2000-present.

### PIANO/KEYBOARD

- Performing own works and the contemporary piano literature, 1983-2007.
- Organ performance, Cincinnati, Ohio, 1995-2005.

### CONDUCTING

- Music Director at St. Pius X Parish, Edgewood, Kentucky, 2004-2005.
- Choral conductor, Cincinnati, Ohio, 1995-2004.
- Music Academy capstone in choral conducting, performing sacred works including J.S. Bach's chorales, Zagreb, Croatia, 1991.

## MISCELLANEA

### LANGUAGE SKILLS

- Fluent in English and Croatian.

- Adept in German and Russian (reading and speaking).
- Proficient in French (reading, basic speaking skills).
- Reading skills in Latin.
- Familiar with several other Slavic languages and dialects.