15th International Conference on New Interfaces for Musical Expression
May 31 - June 3, 2015
Louisiana State University
Baton Rouge, Louisiana
NIME 2015 PROGRAM BOOK

15th International Conference on New Interfaces for Musical Expression

May 31 - June 3, 2015

Louisiana State University
Baton Rouge, LA
This program is made possible in part by a grant from the Charles Lamar Family Foundation as administered through the Arts Council of Greater Baton Rouge.
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NIME REVIEWERS

SCIENTIFIC

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Avanzini, Federico
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Berdahl, Edgar
Bernays, Michel
Berthaut, Florent
Bevilacqua, Frederic
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Bluff, Andrew
Bokesoy, Sinan
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Bouillot, Nicolas
Bown, Oliver

Braasch, Jonas
Brum Medeiros, Carolina
Bryan, Nicholas
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Bukvic, Ivica
Burns, Christopher
Cabrera, Andres
Caramiaux, Baptiste
Choi, Hongchan
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d’Alessandro, Nicolas
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Dahlistedt, Palle
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Donnarumma, Marco
Doornbusch, Paul
Dublon, Gershon
Echeveste, Jose
Eigenfeldt, Arne
Erkut, Cumhur
Essl, Georg
Fels, Sidney
Ferguson, Sam
Fiebrink, Rebecca
Fontana, Federico
Forbes, Angus
Forsyth, Jonathan
Francesco Grani, Francesco
Francoise, Jules
Freeman, Jason
Fyans, Andrew Cavan
Garcia, Jeremie
Geistweidt, Jason
Gelineck, Steven
Gerhard, David
gomi, emilien
Gillian, Nicholas
Gillian, Nick
Glennon, Aron
Grierson, Mick
Gurevich, Michael
Hamilton, Rob
Han, Yoonchang
Helmuth, Mara
Hug, Daniel
Huot, Stéphane
Jaimovich, Javier
Jensenius, Alexander Refsum
Jessop, Elena
Johnson, Bridget
Johnston, Andrew
Jorda, Sergi
Kaltenbrunner, Martin
Kapur, Ajay
Katayose, Haruhiro
Kim, Bongjun
Kim, Gerard Joungyun
Kim, Seunghun
Kimura, Mari
Knapp, Benjamin
Kojs, Juraj
Küssner, Mats
Lee, Kyug
Lee, Sang Won
Leeuw, Hans
Lippe, Cort
Lui, Simon
Lyons, Michael
Maestre, Esteban
Magnusson, Charlotte
Malloch, Joseph
Marquez-Borbon, Adnan
Martin, Charles
Mauro, Davide Andrea
McLean, Alex
McPherson, Andrew
Mealla, Sebastian
Meckin, Dave
Michalakos, Christos
Mital, Parag
Mitchell, Thomas
Nam, Hye Yeon
Neal, Adam
Ng, Kia
Nymoen, Kristian
Oda, Reid
Ogborn, David
Overholt, Dan
Papiotis, Panos
Paradiso, Joe
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Parseihian, Gaetan
Pasquier, Philippe
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Ramirez, Rafael
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**ARTISTIC**

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I. INTRODUCTION
INTRODUCTION/15

WELCOME TO NIME

The NIME conference is a unique and wonderful beast. Equal parts academic research, composition, technological discovery, performance art, interaction design, demonstration, theoretical discourse, art exhibition, and music; the conference is unified by an overriding understanding of the unique ways that music can touch us as listener and we can touch music as performer. As a community we assemble each year to share our explorations, discoveries, and art.

An oft-quoted critique about creating a new interface for musical expression is that once it is realized, the creator is the one and only master of the instrument. It often takes years of development to create an expressive instrument and hours upon hours of rehearsal to master it as a musically expressive tool. In preparing for the 15th NIME conference, we have become acutely aware that our field is coming of age, reaching a point of refinement and history that demands the critical reflection that the NIME conference provides. And so, the 2015 incarnation of the NIME conference brings together these successes and evaluations of failures to inform the NIME community at large and ultimately to further our craft — the art and science of creating expressive interfaces for expressive music.

The Experimental Music & Digital Media program at LSU is housed in the College of Music & Dramatic Arts, yet is deeply integrated with the Center for Computation & Technology (CCT) — a unit that enables high performance computing and big-data research, as well as a focus on Cultural Computing. It is through this collaboration that we are able to support the exploration of creative sound and technology, and ultimately this conference.

As an outreach activity with the CCT and through a collaboration with the Red Stick International Festival, we are able to expose the broader Baton Rouge and Louisiana communities to new modalities for making music. NIME @ Red Stick events appear throughout the Festival, from the opening event with performances by Evidence and Luke DuBois, workshops and NIME maker exhibits at the Maker Fair, and the closing event of the Festival which kicks off the NIME conference - the opening reception of the NIME Art Exhibition.

We are very happy to host the keynote presentations of R. Luke DuBois and Sile O’Modhrain this year. Sile O’Modhrain’s work has focused on
understanding the roles of haptic and auditory feedback in defining and influencing our interactions with music. Luke Dubois has approached the interface for musical expression through visual and data modalities. His works explore interfacing with all three media sources through beautiful and profound interactions.

We are excited to have the participation of the Shaw Center for the Arts, Glassell Gallery, Manship Theatre and the Digital Art faculty at LSU. We were able to curate a large number of sonic artworks that engage sound and interactivity in ways that extend beyond the stage and beyond a single performer. These works hold an interesting perspective on what our interaction with music might look like and what makes an interface expressive. A number of artworks will remain in exhibition at the Shaw Center for the Arts, Manship Theatre, and Glassell Gallery through the month of June.

The concerts are a place for NIME interfaces and music to shine. Twenty-seven performances and an open-mic session will be distributed across the campus. The LSU School of Music’s Shaver Theatre will present traditional stage oriented pieces to excellent effect. The off-campus Varsity Theatre will host intimate late night concerts. A special concert in the Digital Media Center Theatre will utilize the 92-speaker array to showcase various approaches to interfacing with space.

Nine workshops are being hosted that run the gamut from an introduction and primer to NIME, to the construction and programming of various interfaces, workshopping performance approaches and techniques, and even the programming of the art installation Clouds on exhibit at the Shaw Center for the Arts.

Finally, at the core of the conference, the Digital Media Center will host the presentation of 106 papers, posters, and demonstrations of exploration in the world of musical interface. We were incredibly impressed by the quality and diversity of submissions. Through a thorough process of reviewers and meta-reviewers, we have collected an excellent array of cutting edge and innovative projects that both define the current state of musical interface and help shape the future of our discipline.

It takes a huge amount of work and support to put on the NIME conference. We would like to thank our sponsors, volunteers, event organizers, and all of the reviewers who helped put together and
maintain the excellence of the conference.

On behalf of the Louisiana State University College of Music & Dramatic Arts and Center for Computation & Technology, we would like to welcome you to NIME 2015. “Laissez les bons temps rouler!”

Jesse Allison, Stephen David Beck, Edgar Berdahl, Derick Ostrenko, Hye Yeon Nam, Daniel Shannahan
Louisiana State University
II. PRACTICAL INFORMATION
1. DIGITAL MEDIA CENTER
2. FOSTER GALLERY
3. VARSITY BANQUET
4. DMC THEATER
5. VARSITY THEATER
6. LOD COOK HOTEL
7. STAYBRIDGE SUITES
III. KEYNOTE SPEAKERS
R. Luke DuBois is a composer, artist, and performer who explores the temporal, verbal, and visual structures of cultural and personal ephemera. He holds a doctorate in music composition from Columbia University, and has lectured and taught worldwide on interactive sound and video performance. He has collaborated on interactive performance, installation, and music production work with many artists and organizations including Toni Dove, Todd Reynolds, Jamie Jewett, Bora Yoon, Michael Joaquin Grey, Matthew Ritchie, Elliott Sharp, Michael Gordon, Maya Lin, Bang on a Can, Engine 27, Harvestworks, and LEMUR, and was the director of the Princeton Laptop Orchestra for its 2007 season.

Stemming from his investigations of “time-lapse phonography,” his work is a sonic and encyclopedic relative to time-lapse photography. Just as a long camera exposure fuses motion into a single image, his projects reveal the average sonority, visual language, and vocabulary in music, film, text, or cultural information. Exhibitions of his work include: the Institut Valencià d’Art Modern, Spain; 2008 Democratic National Convention, Denver; Weisman Art Museum, Minneapolis; San Jose Museum of Art; National Constitution Center, Philadelphia; Cleveland Museum of Contemporary Art, Daelim Contemporary Art Museum, Seoul; 2007 Sundance Film Festival; the Sydney Film Festival; the Smithsonian American Art Museum; PROSPECT.2 New Orleans; and the Aspen Institute. His work and writing has appeared in print and online in the New York Times, National Geographic, and Esquire Magazine. A major survey of his work, NOW, received its premiere at the Ringling Museum of Art in 2014, with a catalogue published by Scala Art & Heritage Publishers.

An active visual and musical collaborator, DuBois is the co-author of Jitter, a software suite for the real-time manipulation of matrix data developed
by San Francisco-based software company Cycling’74. He appears on nearly twenty-five albums both individually and as part of the avant-garde electronic group The Freight Elevator Quartet. He currently performs as part of Bioluminescence, a duo with vocalist Lesley Flanigan that explores the modality of the human voice, and in Fair Use, a trio with Zach Layton and Matthew Ostrowski, that looks at our accelerating culture through electronic performance and remixing of cinema.

DuBois has lived for the last twenty-two years in New York City. He is the director of the Brooklyn Experimental Media Center at the NYU Polytechnic School of Engineering, and is on the Board of Directors of the ISSUE Project Room. His records are available on Caipirinha/Sire, Liquid Sky, C74, and Cantaloupe Music. His artwork is represented by bitforms gallery in New York City.

SILE O’MODHRAIN, UNIVERSITY OF MICHIGAN

Sile O’Modhrain is a professor at the University of Michigan where she holds a joint appointment in the School of Music and the School of Information. Her research focuses on human-computer interaction, especially interfaces incorporating haptic and auditory feedback. She earned her master’s degree in music technology from the University of York and her PhD from Stanford University’s Center for Computer Research in Music and Acoustics (CCRMA). She has also worked as a sound engineer and producer for BBC Network Radio. Before taking up her position at the University of Michigan, Sile taught at the Sonic Arts Research Centre at Queens University Belfast and, from 2001-2005 directed the Palpable Machines group at Media Lab Europe. Here her work focused on new interfaces for hand-held devices that tightly couple gestural input and touch or haptic display.
IV. PROGRAM
MONDAY, JUNE 1

Registration 8:00AM – 5:00PM | Digital Media Center Lobby

Paper Session 1 9:00AM – 11:00AM | Digital Media Center Theatre

New Instruments for Musical Expression

9:00AM – 9:10AM
Welcome to NIME

9:10AM – 9:30AM
Creating Biosignal Algorithms for Musical Applications from an Extensive Physiological Database
Javier Jaimovich (Departamento de Música y Sonología, Universidad de Chile),
R. Benjamin Knapp (Institute for Creativity, Arts and Technology, Virginia Tech)

9:30AM – 9:55AM
Rawr! A Study in Sonic Skulls: Embodied Natural History
Courtney Brown (Arizona State University), Sharif Razzaque (Inneroptic Technology), Garth Paine (Arizona State University)

9:55AM – 10:15AM
Distributed Mechanical Actuation of Percussion Instruments
Eric Sheffield (University of Michigan), Michael Gurevich (University of Michigan)

10:15AM – 10:25AM
Coffee Break

10:25AM – 10:45AM
Micromotion Interaction in Music/Dance Performance
Alexander Refsum Jensenius (University of Oslo)

10:45AM – 11:05AM
Composing Interactive Dance Pieces for the MotionComposer, a device for Persons with Disabilities
Andreas Bergsland (Norwegian University of Science and Technology), Robert Wechsler (Motion Composer)

11:05AM – 11:25AM
Accessibility and Dimensionality: Enhanced Real-time Creative
Independence for Digital Musicians with Quadriplegic Cerebral Palsy
Brendan McCloskey (Ulster University), Brian Bridges (Ulster University), Frank Lyons (Ulster University)

Poster Session 1 1:00PM – 2:30PM | Louisiana Digital Media Center

Emotion in Motion: A Reimagined Framework for Biomusical/Emotional Interaction
Brennon Bortz (Virginia Polytechnic Institute and State University), Javier Jaimovich (Universidad de Chile), R. Benjamin Knapp (Virginia Polytechnic Institute and State University)

Highland Piping Ornament Recognition Using Dynamic Time Warping
Duncan Menzies (Queen Mary University of London), Andrew McPherson (Queen Mary University of London)

Posture Identification of Musicians Using Non-Intrusive Low-Cost Resistive Pressure Sensors
Dario Cazzani (NOTAM - Sandakerveien 24D, Bygg F3 N-0473 Oslo Norway)

Sense of Space: The Audience Participation Music Performance with High-Frequency Sound ID
Masami Hirabayashi (Institute of Advanced Media Arts and Sciences), Kazuomi Eshima (Laatry)

Doppelgänger: A Solenoid-Based Large Scale Sound Installation.
Asbjørn Blokkum Flø (Norwegian Center for Technology in Music and the Arts - NOTAM), Hans Wilmers (Norwegian Center for Technology in Music and the Arts - NOTAM)

Web-Based Temporal Typography for Musical Expression and Performance
Sang Won Lee (University of Michigan), Georg Essl (University of Michigan)

Start ‘em Young: Digital Music Instrument for Education
Jiffer Harriman (University of Colorado)

What Does ‘Evaluation’ Mean for the NIME Community?
Jeronimo Barbosa (IDMIL, CIRMMT, McGill University), Joseph Malloch (Université Paris-Sud & CNRS, Inria), Marcelo Wanderley (IDMIL, CIRMMT,
McGill University), Stéphane Huot (Inria Lille)

WamBam: A Case Study in Design for an Electronic Musical Instrument for Severely Intellectually Disabled Users
Arvid Jense (Eindhoven University of Technology), Hans Leeuw (Eindhoven University of Technology)

Music-based Respiratory Biofeedback in Visually-Demanding Tasks
Rhushabh Bhandari (Texas A&M University, USA), Avinash Parnandi (Texas A&M University, USA), Eva Shipp (Texas A&M Health Science Center, USA), Beena Ahmed (Texas A&M University, Qatar), Ricardo Gutierrez-Osuna (Texas A&M University, USA)

Musical Notation for Multi-Touch Interfaces
Warren Enström (University of Wisconsin-Milwaukee), Josh Dennis (University of Wisconsin-Milwaukee), Brian Lynch (University of Wisconsin-Milwaukee), Kevin Schlei (University of Wisconsin-Milwaukee)

Womba: A Musical Instrument for an Unborn Child
Aura Pon (University of Calgary), Johnty Wang (McGill University), Laurie Radford (University of Calgary), Sheelagh Carpendale (University of Calgary)

Tibetan Singing Prayer Wheel: A Hybrid Musical - Spiritual Instrument Using Gestural Control
J.Cecilia Wu (UC Santa Barbara), Yoo Hsiu Yeh (Stanford University), Romain Michon (Stanford University), Nathan Weitzner (UC Santa Barbara), Jonathan Abel (Stanford University), Matthew Wright (UC Santa Barbara)

Optical Music Recognition for Interactive Score Display
Dan Ringwalt (Carnegie Mellon University), Roger Dannenberg (Carnegie Mellon University), Andrew Russell (Carnegie Mellon University)

Framework for Exploration of Performance Space
Ozgur Izmirli (Connecticut College)

Managing Musical Complexity with Embodied Metaphors
Richard Graham (Assistant Professor of Music and Technology at Stevens Institute of Technology), Brian Bridges (Lecturer in Music and Creative Technologies at Ulster University)

Motor Imagery: What Does It Offer for New Digital Musical Instruments?
Sair Sinan Kestelli (Istanbul Technical University, Center for Advanced Studies in Music - MIAM)

Demo Session 1 1:00PM – 2:30PM | Louisiana Digital Media Center

Sonification of Fish Movement Using Pitch Mesh Pairs
Andrew Mercer-Taylor (Columbia University), Jaan Altosaar (Princeton University)

PHOX Ears: A Parabolic, Head-mounted, Orientable, eXtrasensory Listening Device
Rebecca Kleinberger (MIT Media Lab), Gershon Dublon (MIT Media Lab), Joseph A. Paradiso (MIT Media Lab), Tod Machover (MIT Media Lab)

The Haptic Hand
Edgar Berdahl (Louisiana State University), Denis Huber (Technical University of Berlin)

Puff, Puff, Play: The Peripipe Remote Control
Tommy Feldt (Kungliga Tekniska Högskolan, Stockholm, Sweden), Sarah Freilich (Kungliga Tekniska Högskolan, Stockholm, Sweden), Shaun Mendonsa (Kungliga Tekniska Högskolan, Stockholm, Sweden), Daniel Molin (Kungliga Tekniska Högskolan, Stockholm, Sweden), Andreas Rau (Kungliga Tekniska Högskolan, Stockholm, Sweden)

A Mobile Music Museum Experience for Children
Mikkel Jørgensen (Aalborg University Copenhagen / Danish App Lab), Aske Knudsen (Aalborg University Copenhagen / Danish App Lab / EduMode), Thomas Wilmot (Aalborg University Copenhagen / Danish App Lab), Kasper Lund (Aalborg University Copenhagen / Danish App Lab), Stefania Serafin (Sound and Music Computing Group, Aalborg University Copenhagen), Hendrik Purwins (Sound and Music Computing Group / Audio Analysis Lab, Aalborg University Copenhagen)

Harmonic Intonation Trainer: An Open Implementation in Pure Data
Hsin-Ming Lin (Department of Music, University of California, San Diego), Chin-Ming Lin (Center of General Education, Chang Jung Christian University)

Indoor localization during installations using WiFi
Antonio Deusany de Carvalho Junior (Universidade de São Paulo), Sang Won Lee (University of Michigan)
Visible Excitation Methods: Energy and Expressiveness in Electronic Music Performance
Dianne Verdonk (Utrecht School of the Arts)

Keynote Presentation 2:30PM – 3:30PM | Digital Media Center Theatre
R. Luke DuBois

Paper Session 2 3:30PM – 5:00PM | Digital Media Center Theatre

Distributed Sound

3:30PM – 3:50PM
Resonate – A Social Musical Installation Which Integrates Tangible Multiuser Interaction
Benjamin Knichel (Hochschule Mainz), Holger Reckter (Hochschule Mainz), Peter Kiefer (Johannes-Gutenberg-Universität Mainz)

3:50PM – 4:10PM
Reflets: Combining and Revealing Spaces for Musical Performances
Florent Berthaut (University of Bristol), Diego Martinez (University of Bristol), Martin Hachet (INRIA Bordeaux Sud-Ouest), Sriram Subramanian (University of Bristol)

4:10PM – 4:30PM
Orchestrating Your Cloud Orchestra
Abram Hindle (University of Alberta)

4:30PM – 4:55PM
Beyond Editing: Extended Interaction with Textual Code Fragments
Charles Roberts (UC Santa Barbara), Matthew Wright (UC Santa Barbara), JoAnn Kuchera-Morin (UC Santa Barbara)

Concert 1 7:30 PM | Shaver Theater

Excerpts from ‘No Place to Hide’ (2014)     Paul Modler, Daniela Näger, Marcela Snasselova
Teka-Mori (2012, revised 2014)  Aurie Hsu & Steven Kemper  
Aurie Hsu, dancer,  Steven Kemper, computer

The Bucket System (2013-2014)  Per Anders Nilsson, Palle Dahlstedt & Gino Robair  
Palle Dahlstedt, keyboard+electronics  Per Anders Nilsson, electronics  Gino Robair, percussion+electronics

Soak (2014)  Akiko Hatakeyama  
Akiko Hatakeyama - custom-made instrument, afterglow - ざんぞう

Soft Revolvers (2014)  Myriam Bleau

Apocryphal Chrysopoeia (2014)  Paul Hembree  
Paul Hembree, computer

Corpus Nil (2014)  Marco Donnarumma & Baptiste Caramiaux  
Marco Donnarumma

Late Night Concert 1  10:30 PM | Varsity Theater

Transmogrified Strings (2014)  Edgar Berdahl  
Edgar Berdahl, performer

cigar boxes (2014)  Lauren Hayes & John Ferguson  
Lauren Sarah Hayes, hybrid analogue-digital electronics,  
John Robert Ferguson, computer extended electric guitar and electronics

Metronom (2013)  Alexandros Kontogeorgakopoulos  
Alexandros Kontogeorgakopoulos:  
custom designed haptic interface

Improvisation (2014)  Paul Schuette & Erica Dicker  
Erica Dicker, prepared violin  Paul Schuette, laptop
TUESDAY, JUNE 2

Registration 8:00AM – 4:00PM | Digital Media Center Lobby

Paper Session 3 9:00AM – 11:30AM | Digital Media Center Theatre

**Musical Human-Computer Interaction with Feedback**

**9:00AM – 9:20AM**
Musical Engagement that is Predicated on Intentional Activity of the Performer with NOISA Instruments
Koray Tahiroğlu (Aalto University, Department of Media), Thomas Svedström (Aalto University, Department of Media), Valtteri Wikström (Aalto University, Department of Media)

**9:20AM – 9:40AM**
BRAAHMS: A Novel Adaptive Musical Interface Based on Users’ Cognitive State
Beste Filiz Yuksel (Tufts University), Daniel Afergan (Tufts University), Evan Peck (Tufts University), Garth Griffin (Tufts University), Lane Harrison (Tufts University), Nick Chen (Tufts University), Remco Chang (Tufts University), Robert Jacob (Tufts University)

**9:40AM – 10:00AM**
Gestroviser: Toward Collaborative Agency in Digital Musical Instruments
William Marley (University of Limerick), Nicholas Ward (University of Limerick)

**10AM – 10:25AM**
Ensemble Feedback Instruments
Muhammad Hafiz Wan Rosli (Media Arts & Technology, UC Santa Barbara), Karl Yerkes (Media Arts & Technology, UC Santa Barbara), Matthew Wright (CREATE & Media Arts & Technology, UC Santa Barbara), Timothy Wood (Media Arts & Technology, UC Santa Barbara), Hannah Wolfe Media Arts & Technology, UC Santa Barbara), Charlie Roberts (Media Arts & Technology, UC Santa Barbara), Anis Haron (Media Arts & Technology, UC Santa Barbara), Fernando Rincon Estrada (Music, UC Santa Barbara)

**10:25AM – 10:35AM**
Coffee Break
10:35AM – 11:00AM
Physical Modeling Concepts for a Panoply of Multisensory Virtual Musical Instruments
James Leonard (ICA Laboratory, Grenoble INP France), Claude Cadoz (ACROE & ICA, Grenoble INP France)

11:00AM – 11:20AM
Auditory Discrimination of Pure and Complex Waveforms Combined with Vibrotactile Feedback
Gareth W. Young (University College Cork), David Murphy (University College Cork), Jeffrey Weeter (University College Cork)

11:20AM – 11:40AM
Exposing the Scaffolding of Digital Instruments with Hardware-Software Feedback Loops
Andrew McPherson (Queen Mary University of London), Victor Zappi (University of British Columbia)

Poster Session 2 1:00PM – 2:30PM | Louisiana Digital Media Center

Developing a Physical Gesture Acquisition System for Guqin Performance
Jingyin He (Victoria University of Wellington), Ajay Kapur (Victoria University of Wellington), Dale Carnegie (Victoria University of Wellington)

Creating Tangible Spatial-Musical Images from Physical Performance Gestures
Natasha Barrett (Institute for Musicology, University of Oslo)

Visual Representation in GENESIS as a Tool for Physical Modeling, Sound Synthesis and Musical Composition
Jerome Villeneuve (ACROE / ICA), Claude Cadoz (ACROE / ICA), Nicolas Castagne (ACROE / ICA)

Interactive Lighting in the Pearl: Considerations and Implementation
Ian Hattwick (McGill University), Marcelo Wanderley (McGill University)

LiVo: Sing a Song with a Vowel Keyboard
Kazuhiko Yamamoto (The University of Tokyo), Takeo Igarashi (The University of Tokyo)
The Hayward Tuning Vine: An Interface for Just Intonation
Robin Hayward (Technical University Berlin)

MalLo: A Distributed Synchronized Musical Instrument Designed For Internet Performance
Zeyu Jin (Princeton University), Reid Oda (Princeton University), Adam Finkelstein (Princeton University), Rebecca Fiebrink (Goldsmiths, University of London)

MuMYO - Evaluating and Exploring the MYO Armband for Musical Interaction
Kristian Nymoen (University of Oslo), Mari Romarheim Haugen (University of Oslo), Alexander Refsum Jensenius (University of Oslo)

SoniControl: Gesture Recognition System for Electric Guitar Using VLF Beacon Signals
Sangwon Suh (GSCT KAIST, Korea), Juhan Nam (GSCT KAIST, Korea), Sung-Hee Lee (GSCT KAIST, Korea)

Tingle: A Digital Music Controller Re-Capturing the Acoustic Instrument Experience
Rhys Duindam (Nupky, Eindhoven University of Technology), Diemo Schwarz (ISMM team, Ircam–CNRS–UPMC), Hans Leeuw (Electrumpet, University of the Arts Utrecht, University of Huddersfield)

Pratical Evaluation of Synthesis Performance on the Beaglebone Black
Ivan Franco (McGill University), Marcelo Wanderley (McGill University)

The Bistable Resonator Cymbal: An Actuated Acoustic Instrument Displaying Physical Audio Effects
Andrew Piepenbrink (Santa Barbara City College), Matthew Wright (UC Santa Barbara)

The Pneumatic Practice Pad
Eric Sheffield (University of Michigan), Sile O’Modhrain (University of Michigan), Michael Gould (University of Michigan), Brent Gillespie (University of Michigan)

Multi-Point Vibrotactile Feedback for an Expressive Musical Interface
Stefano Papetti (ICST, Zurich University of the Arts), Sébastien Schiesser (ICST, Zurich University of the Arts), Martin Fröhlich (ICST, Zurich University of the Arts)

SEPTAR: Audio Breakout Design for Multichannel Guitar
Richard Graham (Assistant Professor at Stevens Institute of Technology), John Harding (Lecturer at Ulster University)

Caress: An Electro-acoustic Percussive Instrument for Caressing Sounds
Ali Momeni (Carnegie Mellon University)

GroupLoop: A Collaborative, Network-Enabled Audio Feedback Instrument
David Ramsay (MIT Media Laboratory), Joseph Paradiso (MIT Media Laboratory)

Demo Session 2 1:00PM – 2:30AM | Louisiana Digital Media Center

Reimagining the Computer Keyboard as a Musical Interface
Si Waite (Staffordshire University)

A Prototype for Pitched Gestural Sonification of Surfaces
Alberto Novello (Royal Conservatoire Den Haag), Antoni Rayzhekov (University for Applied Science - St. Pölten)

A Flexible Platform for Tangible Graphic Scores
Simon Alexander-Adams (University of Michigan, Department of Performing Arts Technology, School of Music Theatre and Dance), Michael Gurevich (University of Michigan, Department of Performing Arts Technology, School of Music Theatre and Dance)

Resonant Bits: Controlling Digital Musical Instruments with Resonance and the Ideomotor Effect
Peter Bennett (University of Bristol), Jarrod Knibbe (University of Bristol), Florent Berthaut (University of Bristol), Kirsten Cater (University of Bristol)

Feedback Lapsteel: Exploring Tactile Transducers As String Actuators
Jiffer Harriman (University of Colorado)

Textural Crossfader
Matthew Blessing (Louisiana State University), Edgar Berdahl (Louisiana State University)

Prototyping Hand-Based Wearable Music Education Technology
Mikko Myllykoski (University teacher), Kai Tuuri (Researcher), Esa Viirret (Project researcher), Jukka Louhivuori (Professor), Antti Peltomaa (Project designer), Janne
Kekäläinen (Project manager)

An Industrial Robot as an Instrument: Details of an Experimental Performance
Jeff Snyder (Princeton University), Ryan Johns (Greyshed), Charles Avis (Princeton University), Gene Kogan, Axel Kilian (Princeton University)

**Paper Session 4 2:30PM - 4:05PM | Digital Media Center Theatre**

**Machine Learning and Musical Performance**

**2:30PM – 2:55PM**
Duet Interaction: Learning Musicianship for Automatic Accompaniment
Guangyu Xia (Carnegie Mellon University), Roger Dannenberg (Carnegie Mellon University)

**2:55PM – 3:20PM**
ml.lib: Robust, Cross-platform, Open-source Machine Learning for Max and Pure Data
Jamie Bullock (Birmingham Conservatoire), Ali Momeni (Carnegie Mellon University)

**3:20PM – 3:45PM**
Mapping Strategies and Sound Engine Design for an Augmented Hybrid Piano
Palle Dahlstedt (University of Gothenburg, Aalborg University)

**3:45PM – 4:05PM**
Designing DMIs for Popular Music in the Brazilian Northeast: Lessons Learned
Jerônimo Barbosa (IDMIL, CIRMNT, McGill University), Filipe Calegario (IDMIL, CIRMNT, McGill University Centro de Informática - Universidade Federal de Pernambuco), João Tragtenberg (Centro de Informática - Universidade Federal de Pernambuco), Giordano Cabral (Centro de Informática - Universidade Federal de Pernambuco), Geber Ramalho (Centro de Informática - Universidade Federal de Pernambuco), Marcelo M. Wanderley (IDMIL, CIRMNT, McGill University)
Concert 2 8:00 PM | Digital Media Center Theatre

very long cat (2015)          David Ogborn & Shawn Mativetsky
     David Ogborn, live coding, Shawn Mativetsky, tabla

3 agents + 1 (2014)          Koray Tahiroğlu
     Koray Tahiroğlu

Space in Hands (2014)        Yemin Oh
     Yemin Oh, leap controller

     Natasha Barrett, computer

I’ll Be On The Water (2013)   Anna Weisling & Miguel Ortiz
     Anna Weisling, visuals, Miguel Ortiz, sound

Fields (2014)                Tim Shaw & Sébastien Piquemal
     Tim Shaw & Sébastien Piquemal, Electronics

of the survival of images (2013) Butch Rovan & Ami Shulman
     Butch Rovan, GLOBE controller

Late Night Concert 2 10:30 PM | Varsity Theater

Open mic - Bring your own NIME

WEDNESDAY, JUNE 3

Registration 8:00AM – 4:00PM | Digital Media Center Lobby

Paper Session 5 9:00AM – 11:30AM | Digital Media Center Theatre

Mobile and Cultural Computing

9:00AM – 9:20AM
Fields: An Exploration into the use of Mobile Devices as a Medium for Sound Diffusion
Tim Shaw (Culture Lab, Newcastle University), Sébastien Piquemal (Media Lab, Aalto University), John Bowers (Culture Lab, Newcastle University)
9:20AM – 9:40AM
MMODM: Massively Multiplayer Online Drum Machine
Basheer Tome (Tangible Media Group MIT Media Lab), Donald Derek Haddad (Responsive Environments MIT Media Lab), Tod Machover (Opera of the Future MIT Media Lab), Joseph Paradiso (Responsive Environments MIT Media Lab)

9:40AM – 10:00AM
Collaborative Musical Instrument Design Process for Mobile Technology
Timothy J. Barraclough (Victoria University of Wellington), Dale A. Carnegie (Victoria University of Wellington), Ajay Kapur (California Institute of Arts)

10:00AM – 10:20AM
Game Design for Expressive Mobile Music
Ge Wang (Stanford University)

10:20AM – 10:30AM
Coffee Break

10:30AM – 10:50AM
Enacting Musical Worlds: Common Approaches to Using NIMEs within Both Performance and Person-Centred Arts Practices
Lauren Hayes (Arizona State University)

10:50AM – 11:10AM
Carolan: A Guitar That Tells its Story
Steve Benford (University of Nottingham), Adrian Hazzard (University of Nottingham), Alan Chamberlain (University of Nottingham), Liming Xu (University of Nottingham)

11:10AM – 11:35AM
Fourteen Years of NIME: The Value and Meaning of “Community” in Interactive Music Research
Adnan Marquez-Borbon (Sonic Arts Research Centre – Queen’s University Belfast), Paul Stapleton (Sonic Arts Research Centre – Queen’s University Belfast)

Poster Session 3 1:00PM – 2:30PM | Louisiana Digital Media Center

Pd Poems and Teaching Tools
Jiffer Harriman (University of Colorado)
But Does it Float? Reflections on a Sound Art Ecological Intervention  
Adnan Marquez-Borbon (Sonic Arts Research Centre - Queen’s University Belfast)

Pragmatic Drum Motion Capture System  
Robert Van Rooyen (University of Victoria), George Tzanetakis (University of Victoria)

Stage vs. Channel-Strip Metaphor: Comparing Performance when Adjusting Volume and Panning of a Single Channel in a Stereo Mix  
Steven Gelineck (Aalborg University Copenhagen), Dannie Korsgaard (Aalborg University Copenhagen), Morten Büchert (Rhythmic Music Conservatory, Copenhagen)

Gestural Electronic Music using Machine Learning as Generative Device  
Jan C. Schacher (Zurich University of the Arts), Chikashi Miyama (ZKM), Daniel Bisig (Zurich University of the Arts)

Sensors on Stage: Conquering the Requirements of Artistic Experiments and Live Performances  
Simon Waloschek (Center of Music and Film Informatics - ZeMFI), Aristotelis Hadjakos (Center of Music and Film Informatics - ZeMFI)

Serverless and Peer-to-Peer Distributed Interfaces for Musical Control  
Andres Cabrera (University of California Santa Barbara)

Tracking Ensemble Performance on Touch-Screens with Gesture Classification and Transition Matrices  
Charles Martin (Research School of Computer Science, ANU), Henry Gardner (Research School of Computer Science, ANU), Ben Swift (Research School of Computer Science, ANU)

Major Thirds: A Better Way to Tune Your iPad  
Hans Anderson (Singapore University of Technology and Design), Kin Wah Edward Lin (Singapore University of Technology and Design), Natalie Agus (Singapore University of Technology and Design), Simon Lui (Singapore University of Technology and Design)

Representation-Plurality in Multi-Touch Mobile Visual Programming for Music  
Qi Yang (University of Michigan, Computer Science & Engineering Division),
Georg Essl (Electrical Engineering & Computer Science and Music)

Generate Expressive Music from Picture with a Handmade Multi-Touch Music Table
Simon Lui (Singapore University of Technology and Design)

AirPiano: A Multi-Touch Keyboard with Hovering Control
Nicolas d’Alessandro (University of Mons), Joëlle Tilmanne (University of Mons), Ambroise Moreau (University of Mons), Antonin Puleo (University of Mons)

Considering Musical Structure in Location-Based Experiences
Adrian Hazzard (University of Nottingham), Steve Benford (University of Nottingham), Alan Chamberlain (University of Nottingham), Chris Greenhalgh (University of Nottingham)
Liveness Through the Lens of Agency and Causality
Florent Berthaut (University of Bristol), David Coyle (University College Dublin), James Moore (Goldsmiths, University of London), Hannah Limerick (University of Bristol)

VESBALL: A Ball-Shaped Instrument for Music Therapy
Ajit Nath (City University of Hong Kong), Samson Young (City University of Hong Kong)

RWA – A Game Engine for Real World Audio Games
Thomas Resch (University of Music Basel, TU-Berlin)

MobileFaust: a Set of Tools to Make Musical Mobile Applications with the Faust Programming Language
Romain Michon (CCRMA - Stanford University), Julius Orion III Smith (CCRMA - Stanford University), Yann Orlarey (GRAME - Centre National de Création Musicale)

Demo Session 3 1:00PM – 2:30AM | Louisiana Digital Media Center

claVision: Visual Automatic Piano Music Transcription
Mohammad Akbari (School of Engineering Science, Simon Fraser University, 8888 University Drive, Burnaby, British Columbia, Canada V5A 1S6), Howard Cheng (Department of Mathematics and Computer Science, University of Lethbridge, 4401 University Drive, Lethbridge, Alberta, Canada T1K 3M4)
Arrangements: Flexibly Adapting Music Data for Live Performance
Roger Dannenberg (Carnegie Mellon University), Andrew Russell (Carnegie Mellon University)

The Bucket System - A Computer Mediated Signalling System for Group Improvisation
Palle Dahlstedt (University of Gothenburg, Aalborg University), Per Anders Nilsson (University of Gothenburg), Gino Robair (Independent artist)

Prototyping Audiovisual Performance Tools: A Hackathon Approach
Nuno N. Correia (Goldsmiths, University of London), Atau Tanaka (Goldsmiths, University of London)

ChordEase: A MIDI Remapper for Intuitive Performance of Non-Modal Music
Chris Korda (whorld.org)

MusicMapper: Interactive 2D Representations of Music Samples for In-Browser Remixing and Exploration
Ethan Benjamin (Columbia University), Jaan Altosaar (Princeton University)

Descriptors for Perception of Quality in Jazz Piano Improvisation
Jeff Gregorio (Drexel University), David Rosen (Drexel University), Michael Caro (Drexel University), Youngmoo E. Kim (Drexel University)

Snare Drum Motion Capture Dataset
Robert Van Rooyen (University of Victoria), Andrew Schloss (University of Victoria), George Tzanetakis (University of Victoria)

Keynote Presentation 2:30PM – 3:30PM | Digital Media Center Theatre
Sile O’Modhrain
Once more, with feeling: Revisiting the roll of touch in performer-instrument interaction.

Paper Session 6 3:30PM – 4:30PM | Digital Media Center Theatre

Robotic Music

3:30PM – 3:50PM
MARIE: Monochord-Aerophone Robotic Instrument Ensemble
Troy Rogers (Expressive Machines Musical Instruments), Steven Kemper (Music Department, Mason Gross School of the Arts, Rutgers, The State University of New Jersey), Scott Barton (Humanities and Arts Department, Worcester Polytechnic Institute)

3:50PM – 4:10PM
A Methodology for Evaluating Robotic Striking Mechanisms for Musical Contexts
Jason Long (Victoria University of Wellington), Jim Murphy (Victoria University of Wellington), Ajay Kapur (Victoria University of Wellington), Dale Carnegie (Victoria University of Wellington)

4:10PM – 4:30PM
Realtime Classification of Hand-Drum Strokes
Michael Krzyzaniak (Arizona State University School of Arts, Media + Engineering), Garth Paine (Arizona State University School of Arts, Media + Engineering)

NIME Town Hall Meeting 4:30PM – 5:00PM | Digital Media Center Theatre

Concert 3 7:30 PM | Shaver Theatre

Se-Lien Chuang, bass recorder/grand piano, interactive visuals,
Andreas Weixler, multichannel audio realtime processing

Circle Suite (Circle Squared, Circle Keys, Circle Self) (2011-2014) Palle Dahlstedt

The Rush of the Brook Stills the Mind (2013) Elainie Lillios
Scott Deal, percussion

Shawn Greenlee, granite lithophone, mallets, custom software

Jeu de modes/Tiresias (2013) Andreas Bergslan & Robert Wechsler
Feedback Rings (2014)                          The CREATE Ensemble
Muhammad Hafiz Wan Rosli, Karl Yerkes, Matthew Wright, Tim
Wood, Hannah Wolfe, Charlie Roberts, Anis Haron, Fernando
Rincón Estrada, computers

Late Night Concert 3 10:30 PM | Varsity Theater

Conjuring the Machine (2014)                          Steven Kemper
Steven Kemper, guitar

Blinky Gibberings (2014)                          Charlie Roberts
Charlie Roberts

Electroacoustic improvisation with Espongina and
Lobatus (2015)                          Mercedes Blasco
Merche Blasco, Lobatus and Espongina
V. CONCERT NOTES
MONDAY, JUNE 1

Concert 1 7:30 PM | Shaver Theater

Excerpts from ‘No Place to Hide’ (2014) Paul Modler, Daniela Näger, Marcela Snasselova

Teka-Mori (2012, revised 2014) Aurie Hsu & Steven Kemper
Aurie Hsu, dancer, Steven Kemper, computer

The Bucket System (2013-2014) Per Anders Nilsson, Palle Dahlstedt & Gino Robair
Palle Dahlstedt, keyboard+electronics Per Anders Nilsson, electronics Gino Robair, percussion+electronics

Soak (2014) Akiko Hatakeyama
Akiko Hatakeyama - custom-made instrument, afterglow - さんぞう

Soft Revolvers (2014) Myriam Bleau

Apocryphal Chrysopoeia (2014) Paul Hembree
Paul Hembree, computer

Corpus Nil (2014) Marco Donnarumma & Baptiste Caramiaux

Excerpts from ‘No Place to Hide’ (2014)
‘No Place to Hide’ is the title of a book by Glenn Greenwald which is based on digital documents handed over to journalists and organisations by E. Snowden in 2013. A dancer interacts with a motor-controlled speaker system which is used for a text to speech software to read out excerpts from ASCII documents to the audience. Although the documents reside on local hard drives they could be streamed from remote servers given that accessibility is granted or organised through alternate approaches. Body as a paradigm for intuitive self-conception is opposed to machine. Who serves whom, who controls who, or do both combine to a hybrid individual? Or will fall apart in failure, fear and destruction? Body interaction and spatial audio is explored as a symbol
for immersivity and embodiment of media. It experiments with diverged aspects of data and technology to their effect on living, communication and person.

Daniela Näger is a free lance dancer and choreographer. She studied dance theater, stage dance, Butoh and Acting at Dance Academy in Tilburg (NL). She is performing in solo pieces and collaborative projects such as of Elsa van der Heijden or Sasha Waltz.

Marcela Snášelová is a scenographer, set designer and media artist. She develops and realizes artistic concepts for stage, installation, costumes and dance choreography for various events and venues.

Paul Modler is a researcher, musician and composer of computer-oriented music. His interests are in multichannel spatialisation, music interaction, gesture recognition and gestural control of music and improvisation techniques.

**Teka-Mori (2012, revised 2014)**

Teka-Mori, for belly dancer, Remote electroAcoustic Kinesthetic Sensing (RAKS) system, and computer-generated sound, features an interactive, bi-directional relationship between movement and music that connects choreographic gestures and sonic outcomes. Teka refers to the vocalization of two different drum strokes on a doumbek. Mori, adapted from the Latin phrase memento mori, evokes the idea of lifelessness and decay. Teka-Mori conveys a dystopian, “broken-machine” aesthetic through noisy, distorted sonic materials. The choreography in Teka-Mori is rooted in belly dance, which originated in the U.S., but is derivative of Raqs Sharqi (Middle Eastern dance). Sinuous torso undulations, controlled hip isolations, and upper and lower body layering are a few characteristics of the movement vocabulary. The RAKS system is a wearable wireless sensor interface designed specifically for belly dance movement, consisting of a flex sensor, accelerometer, and programmable LEDs.

Aurie Hsu is a composer and performer. Aurie’s pieces have been presented at ICMC, SEAMUS, SIGCHI, Pixelerations, Third Practice Festival, and the Logos Tetrahedron Concert Hall. She received a Ph.D. in Composition and Computer Technologies from the University of Virginia and she holds degrees from Oberlin Conservatory and Mills College. She is a lecturer at Rutgers University.

Steven Kemper creates music for acoustic instruments, instruments and computers, musical robots, dance, video, and networked systems. He is currently Assistant Professor of music technology and composition in the Music Department at the Mason Gross School of the Arts at Rutgers University.
**The Bucket System (2013-2014)**

The Bucket System is a new work centered around a computer-mediated ensemble improvisation system. We call this “systemic improvisation”, where there is no predetermined timeline or predefined musical content. The music emerges from the dynamics of the system in an encounter with the personalities of the players. It comes out of a tradition of structured free ensemble improvisation practices, a.k.a. comprovisation in addition to influences from experimental and avant-garde music practices of the post World War 2 period. The Bucket System is a signaling system between musicians, based on a set of McMillen QuNeo:s controllers as both input and output interfaces together with custom software implemented in Pure Data. It allows for a new kind of on-stage compositional/ improvisation interaction within a group of acoustic or electronic musicians.

**Palle Dahlstedt** (Sweden, b.1971): Composer, improviser and researcher, Obel Professor in Art & Technology at Aalborg University and Reader in Computer-aided Creativity, University of Gothenburg. Received the Gaudeamus Prize in 2001.

**Per Anders Nilsson** (Sweden, b.1954): Improviser and electroacoustic composer, professor at the Academy of Music and Drama, Gothenburg. Has performed with Evan Parker, Willem Breuker, Anthony Braxton, AMM, etc.

**Gino Robair** (USA, b.1963) has played with Tom Waits, Anthony Braxton, John Zorn, Nina Hagen, Terry Riley, Lou Harrison, John Butcher, Derek Bailey, Peter Kowald, Otomo Yoshihide, etc. His opera, I, Norton, has been performed throughout North America and Europe.

**Soak (2014)**

Soak is a live interactive piece composed for a custom-made instrument called “afterglow - さんぞう”. A performer (myself) plays music by creating black and white drawing using grains of salt. The 27 photocells of the instrument distributed onto the analog TV screen react to various light intensities emitted from the TV screen – the contrast created with salt on a black background. The performer creates a live-interactive loop of visual and aural outcomes by using her perceptions.

Soak is partially inspired by sand box therapy. Instead of placing objects inside of a sand-filled box, I use sea salt (another type of grains) to reflect non-verbal thoughts and feelings at the moment. Salt has been used in rituals and ceremonies in many cultures with beliefs of power in cleansing. My belief in this power is neutral, but I have experienced
tranquilizing feelings interacting with sea salt with my bear hands.

The sound is a series of audio samples of a metal pan in various pitches. Some frequencies are tuned close from each other, so when they are triggered at the same time by the drawing, audible beatings happen. This is inspired by gongs such as gamelan.

Akiko Hatakeyama is a composer, singer, and audio-visual artist who also builds instruments/controllers. She is interested in crossing boundaries between traditionally written music, improvisation, electronics, computer based live interactivity, and visual components. Storytelling, memories, and nature often play an important role in Akiko’s work, and she most often finds beauty in simplicity. Akiko obtained her B.A. in music from Mills College and M.A. in Experimental Music/Composition at Wesleyan University. Akiko is currently engaged in PhD study in the MEME program at Brown University. Her instructors include Alvin Lucier, Anthony Braxton, Ronald Kuivila, Maggi Payne, Todd Winkler and Butch Rovan.

**Soft Revolvers (2014)**

Soft Revolvers is a audiovisual performance for 4 spinning tops built with clear acrylic by the artist. Each top is associated with an ‘instrument’ in an electronic music composition and the motion data collected by sensors – placed inside the tops – informs musical algorithms. With their large circular spinning bodies and their role as music playing devices, the interfaces strongly evoke turntables and DJ culture, hip hop and dance music. LEDs placed inside the tops illuminate the body of the objects in a precise counterpoint to the music, creating stunning spinning halos.

Myriam Bleau is a composer, digital artist and performer based in Montreal. Exploring the limits between musical performance and digital arts, she creates audiovisual systems that go beyond the screen, such as sound installations and performance-specific musical interfaces. Her presence on the popular music scene influence her hybrid electronic practice that integrates hip hop, techno, experimental and pop elements. Her work has been presented across Canada, in the US and in Europe in festivals and conferences such as Transmediale, Digital Quebec at the BFI in London, Elektra, Akousma, Mois Multi, NIME and ICLI.

**Apocryphal Chrysopoeia (2014)**

Apocryphal Chrysopoeia is a generative, synesthetic, virtual instrument that allows a computer musician to explore a space of light and sound simultaneously. The conceptual core of this virtual instrument is a columnar structure of forty-eight cells, represented visually by light-producing geometric primitives and sonically by synthesized tones.
These cells are arranged in space according to a multi-dimensional model of traditional equal-tempered pitch perception. In this model, harmonic proximity is correlated with spatial proximity. Furthermore, as in a real space, distant events sound quieter, while closer events sound louder. Thus, observer proximity and the shape of collections of nearby cells creates the sensation of harmonic fields. As the array of cells rotates these harmonic fields modulate as new pitch-classes are introduced.

The array of cells is activated by a two-dimensional, hexagonal cellular automata, which is wrapped onto the three-dimensional columnar structure. Cellular automata were chosen because of their ability to evolve in a dynamic and variegated fashion across space in a way that resembles, but is not identical to, musical voice-leading.

The performer creates musical behavior and drama by manipulating cellular activity directly or environmentally, while navigating and distorting the virtual space, highlighting the sound and light activity at various locations.

Paul Hembree’s work explores the boundaries between the perceptual categories of sonic materials in a search for uncanny or sublime hybrids. His works have been performed around the United States and Europe, at events including IRCAM’s ManiFeste, MusicX, the NWEAMO Festival, and the California Electronic Music Exchange. Hembree works with Roger Reynolds as a computer music assistant, performing alongside artists including Mark Dresser, Southwest Chamber Music, and Ensemble Signal. Hembree’s scholarship and audio engineering on Edgard Varése’s Ionisation was featured in Perspectives of New Music. As a guest speaker he has presented at Harvard University, Acanthes Academy, and SUNY Buffalo.

Corpus Nil (2014)
Corpus Nil is a body art performance for biophysical sensing technologies, surround sound and interactive light.

A body is kneeling on the floor in the dark. Feeble crackle sounds fill the room and flashes of dim light barely illuminate the scene. Through a series of movements that explore the limits of muscular tension, limbs torsion, skin friction and equilibrium the body parts are reconfigured.

As it moves, the body produces neural and muscular signals that are captured through a combination of biophysical wearable sensors. A software computes the biosignals to extract information on expressive aspects of the body movements, like force, abruptness and articulation.
According to those expressive parameters, the system creates sound forms and light patterns. These emerge from the body, but are not directly controlled by it.

The sonic world shifts across textural constructions and microtonal variations, while a play of light and darkness hinders the spectators’ view of the shape-shifting body on stage. Echoes and shadows embraces the body so that the skin and the bones appear as new surfaces, the fingers and the neck seem to move as new limbs. The combination of sound, light and movement ascribes alternative qualities to the flesh.

Marco Donnarumma is a performer, sound artist, musician and writer. He has played interactive music by amplifying sounds from his body, has induced visitors in altered states of self-perception by feeding sounds from their bodies back to their skulls and bones, has immersed audiences in multichannel sound and video produced by the strain of his muscles while he pulled 50kg stones, and has physicalised digital viruses in the body. Marco is about to complete a PhD with Atau Tanaka and Matthew Fuller at Goldsmiths, University of London. His company, XTH, will soon launch a new biophysical musical instrument.

Late Night Concert 1 10:30 PM | Varsity Theater

Transmogrified Strings (2014) Edgar Berdahl
Edgar Berdahl, performer

cigar boxes (2014) Lauren Hayes & John Ferguson
Lauren Sarah Hayes, hybrid analogue-digital electronics,
John Robert Ferguson, computer extended electric guitar
and electronics

Metronom (2013) Alexandros Kontogeorgakopoulos
Alexandros Kontogeorgakopoulos:
custom designed haptic interface

Improvisation (2014) Paul Schuette & Erica Dicker
Erica Dicker, prepared violin Paul Schuette, laptop

Transmogrified Strings (2014)
Oxford Dictionaries defines transmogrify as “Transform, especially in a surprising or magical manner.” This is the core concept of ‘Transmogrified Strings,’ which aspires to surprise the listener with sounds that are both new yet uncannily familiar. In each section, virtual plucked string
instruments are transformed via a specific kind of operation. For example, strings can be tuned as low as 0.5Hz or as high as the upper bounds of human hearing. The virtual strings retain their tangible character even as the sound changes drastically, and the feel of the instruments changes too, which in turn affects the performer’s interaction with the virtual strings. The composition is organized into various sections, each of which is preceded and punctuated by the strumming of a harp. As the strings are transmogrified differently in each section, they are specifically solemnified, demystified, vivified, solidified, and declassified.

Edgar Berdahl is an Assistant Professor in Experimental Music and Digital Media (EMDM) at Louisiana State University (LSU). His work is motivated by the intimate and immediate qualities of acoustic music performance. He aspires to endow novel digital instruments with these same qualities by leveraging high-fidelity force feedback, physical modeling, and other advanced technologies. Berdahl also aims to provide new insights into the constantly evolving forefront of EMDM research. With this goal, he spends half of his time working within LSU’s Cultural Computing group at the Center for Computation and Technology (CCT).

cigar boxes (2014)
Ferguson/Hayes is the ongoing collaboration between composer/performer/improvisers John Robert Ferguson and Lauren Sarah Hayes. Excited by the sonic possibilities offered by digitally augmented instruments, their practices explore the common themes of physicality, gestural interaction and responsiveness in live electronic performance. Their diverse approaches to instrument building offer up a startling combination, which includes two unique and individualised performance systems: laptop-processed electric guitar with external controllers; and drum machines, haptic-controllers, analogue synthesizers and laptop. In combination they navigate through various sonic territories while striving to negotiate structures and establish communication within a collaborative improvisational environment.

Dr. John Robert Ferguson is a post-digital/electronic musician and Visiting Assistant Professor at Multimedia and Electronic Music Experiments, Brown University. Prior to this he was a Lecturer in Music and Creative Music Technologies at Kingston University near London (2010-2013). John has performed nationally/internationally, notable events include: Club Transmediale (DE), Borealis festival for Contemporary Music (NO), AV Festival (GB), DNK Amsterdam (NL). His work has been published through Leonardo Music Journal, Leonardo Electronic Almanac, Contemporary Music Review, and Clinical Archives. His collaboration with Paul Vandemast-Bell as Tron Lennon was nominated for the Transmediale award (for digital arts and culture) in 2008. http://johnrobertferguson.com
Lauren Sarah Hayes is a composer/performer/improviser from Glasgow, UK. Her work explores physicality and tactility within live electronic music through performance systems comprising ad-hoc combinations of bespoke software, prepared piano, analogue monosynths, drum machines and electronics. She enjoys performing her music around the world in unconventional spaces, engaging with a broad range of collaborators, as well as writing about the musical implications of new technologies. Since 2012 she has been an associate of the New Radiophonic Workshop and is currently Visiting Assistant Professor in Sound Studies at Arizona State University. http://laurensarahhayes.com

**Metronom (2013)**
Metronom, which stands for metronome in Welsh, is a live audiovisual composition for a custom designed haptic interface. The interface consists of four haptic faders, and a digitally fabricated transparent acrylic structure, etched and cut according to the requirements of the music and the visual content. The performer interacts haptically with the moving faders, which behave like metronomes, at various tempi and rhythmic motifs. The faders’ mechanical sounds are recorded and processed in real-time by digital signal processing algorithms and projected sonically back into space. Moreover, the positions of the faders, driven by automated procedures and altered mechanically by the performer gestures, are controlling various compositional parameters affecting the timbre, the rhythm and the movement of various projected words and phrases. A gradual interplay between the shadows of the physical interface’s structure, the human gestures and the light refraction from the acrylic surfaces shapes equally the visual elements of the composition. The present inter-media performance, is an interactive audio-visual composition and a dance between the hands of the performer and the movements of the haptic interface.

Alexandros Kontogeorgakopoulos is a computer music researcher, a senior lecturer and a musician / sonic artist. He has studied physics, computer science, digital arts, classical music and computer music in Greece and in France where he obtained his PhD in 2008. His research and musical interests are situated at the intersection of music, art, science and technology. He has also participated in several music ensembles and composed electroacoustic and electronic music. Alexandros is a currently a senior lecturer in Sonic Arts and Art/Science/Technology in Cardiff Metropolitan University - Cardiff School of Art and Design in Cardiff UK.

**Improvisation (2014)**
Two and a half years ago, I began working with a fabulously gifted improvising violinist, Erica Dicker. The intricate and diverse sonic palette
that she is able to create is a rich source for digital manipulations, and my collaboration with her has led me to develop some unique and personally tailored software and hardware that I use when performing with her. Early on in our collaboration, Erica had the idea for a 4-channel violin pick-up: a pick-up that could output each of her strings on a different channel. Three iterations later (and a pile of oddly shaped electromagnetic coils to prove it), we succeeded in creating a device that accomplishes this goal. The initial implication was that each of her strings could be processed in different ways simultaneously: delay on the G-string, ring mod on the D-string, etc. While we do make extensive use of the device in this way, the ability to spatialize her sound in exciting ways has also proven to be useful. Imagine a trill begging on two strings in the corner of a quadraphonic speaker arrangement and then the trill splitting in two as the strings get routed in different directions!

Paul Schuette is a composer, sound artist, and performer living and working in Cincinnati, OH. According to Citybeat Cincinnati, he creates “works of art that address multiple senses simultaneously and thoughtfully, no matter the context.” In the concert hall, his music seeks to enhance live performers potential with live electronics. His influences range from theoretical physics to the visual arts, and his music often incorporates unique hardware and computer software. As a performer, Schuette deploys his menagerie of handmade electronic instruments in improvised settings and is a member of the ensemble ‘Vaster than Empires’ with Erica Dicker and Allen Otte.

TUESDAY, JUNE 2

Concert 2 8:00 PM | Digital Media Center

very long cat (2015)       David Ogborn & Shawn Mativetsky
   David Ogborn, live coding, Shawn Mativetsky, tabla

3 agents + 1 (2014)       Koray Tahiroğlu
   Koray Tahiroğlu

Space in Hands (2014)     Yemin Oh
   Yemin Oh, leap controller

   Natasha Barrett, computer

I’ll Be On The Water (2013)   Anna Weisling & Miguel Ortiz
   Anna Weisling, visuals, Miguel Ortiz, sound
very long cat (2015)
very long cat are a new network music ensemble combining tabla (Shawn Mativetsky) and live coding (David Ogborn), rehearsing and performing via the Internet and employing an eclectic range of techniques and technologies drawn from the NIME and neighbouring universes. For NIME-2015 we will perform a network music “comprovisation” with algorithmic spatialization - with the tabla performance happening in Montréal and the live coding performance happening “on the ground” at NIME.

very long cat rehearses regularly over the Internet (since September 2014). The software jacktrip is used to establish a full resolution audio link between McMaster University’s Department of Communication Studies and Multimedia (Hamilton, Canada) and McGill University’s Centre for Interdisciplinary Research in Music, Media and Technology (Montréal, Canada). The ensemble exploits the gestural ambivalence of live coding to overcome the fundamental problem of latency in network music: the signal resulting from the live coding is monitored with a carefully calibrated delay so as to line up with the signal arriving from the remote microphones.

3 agents + 1 (2014)
The composition 3 agents + 1 exploits recently developed affordances in NOISA musical instruments. These instruments act as three networked-agents in live performance to maintain and deepen the performer’s engagement with their interfaces in an unusual way. The instruments are extended to incorporate the performance as they become part of the distribution of decision-making, transforming their physical control inputs consistently and communicating with the performer within own acoustic contexts. These three networked-agents maintain their physical actions within a shared intelligent model, monitoring performer’s bodily movements, facial expressions and control inputs. NOISA is a novel instrument with an embedded interactive system, you can find the detailed system description at http://sopi.aalto.fi/research/noisa/.
Koray Tahiroğlu is a musician, research fellow and lecturer in the Department of Media, Aalto University School of Arts, Design and Architecture. He practices art as a researcher focusing on embodied approaches to sonic interaction in participative music experience, as well as a performer of live electronic music. Since 2004, he has been also teaching workshops and courses introducing artistic strategies and methodologies for creating interactive music. Tahiroğlu has performed experimental music in collaboration as well as in solo performances in Europe and North America.

Space in Hands (2014)
Some people think the world is run by a god, while others think it is governed by randomness. Nature can seem random, but is actually run by a natural law which controls the world. I am not trying to persuade you that a god exists, but that rules or laws, whatever you define them, control the universe. This could mean an artificial rule created by a god, or it could be just a natural rule with no divine origin. It might be a psychological phenomenon that people want to personify and call it a god to understand the rules. In this piece, I attempt to actualize the rule on the screen through the vessel of my body. The piece was originally composed for the Meyer Constellation system in Louisiana State University, and the position of hands is controlling the array of the speakers.

Yemin Oh is a composer who is always looking for fascinating and captivating music. His main interests lie in several area including acoustic composition, visual music, electro-acoustic composition and interactive multi-media work. His pieces incorporate his aesthetic aim into blending visual elements, and live electronics. Currently he is teaching at Kyunghee University as Lecturer. Previously he graduated Louisiana State University for Ph.D in Experimental Music & Digital Media. He graduated Kyunghee University and University of Hartford for a B.M. and G.P.D. in music composition, and Georgia Southern University for an M.M. in music technology. His works have been selected and invited to present at several music concerts and conferences, including EMM, N_SEME, SEAMUS, NIME, NYCEMF, and ICMC.

Topology Chamber 1 (2014-2015)
‘Topology Chamber 1’ is a hybrid between improvisation, live spatialisation and composition, investigating the links between acousmatic sound and physical spatial gestures.

The spatial source for ‘Topology Chamber 1’ is 3D motion data captured during source-sound recording sessions using the Qualisys optical motion-capture system. From this performed spatial data, a new dataset
is ‘assembled’, focusing on spatial-temporal gestures and spatial-morphological archetypes. This new 3D spatial data is sonified in the performance using a custom made dynamically interactive parameter mapping sonification programme. The work also combines pre-sonified sound and other materials shaped spectromorphologically by the original data.

Spatial sonification is in higher-order ambisonics (HOA) incorporating distance cues and allowing complete freedom in scaling and in the location of the virtual listening point. The use of interactive HOA was found to be key in creating tangible spatial images.

This research focuses on investigating in detail the general observation that electroacoustic music has historically been preoccupied with gesture and space, where sounds liberated from their visual causation evoke vivid spatial sonic-imagery.

Natasha Barrett is a freelance composer and recently appointed as research fellow at the University of Oslo, Department of Musicology. Her output encompasses instrumental and electroacoustic composition, sound-art, sound-architectural installations, theatre compositions and interactive projects. In addition to collaborating with performers, she often involves experimental designers and scientists in her work, exploring auditory perception and sound’s spatio-musical potential in 3D. Barrett’s works are performed and commissioned throughout the world, receiving numerous prizes, including the prestigious Nordic Council Music Prize. Her work is available on a number of CD, DVD-audio and SACD releases. For more information: www.natashabarrett.org

I’ll Be On The Water (2013)
I’ll Be On The Water is a duo performance in which both audio and video are generated and directed through physical gesture and tactile manipulation. The use of a tangible instrument not only embodies the overall metaphor of the piece (that memory can be elusive, buried, and uncovered) but also affords the opportunity for both parties to step away from their screens and collaborate in an immersive way—something visual performers can not often do. Ultimately, the piece reflects the fragmented and sometimes invasive nature of an experience that cannot be either recalled quite clearly enough, nor entirely forgotten.

Anna Weisling is an active and dedicated collaborator who explores the relationship between sound and image, and the performance possibilities shared by both. She has a Master’s degree in Sonic Arts from Queen’s University Belfast and is currently the Music Technology Specialist at The Juilliard School in New York.
Miguel Ortiz is a Mexican composer and sound artist based in London. His research explores a vast array of performing mediums ranging from traditional acoustic instruments such as cello and trumpet, to laptop improvisation, performance with bio-instruments and hyper-instruments.

**Fields (2014)**
In this performance we present Fields, a networked system implementing an alternative method for sonic diffusion. This work uses the mobile devices of audience members as an array of speakers controlled live by a centralized performer. Fields refers to two main, interconnecting parts: (1) an audio playback system using web technologies to diffuse sound live through the inbuilt speakers of the audience’s mobile devices. (2) A specially designed composition and performance demonstrated through the system presenting this new approach to sound diffusion. The system is available over Wi-Fi and participants can easily connect through a web browser. Offering both a new technological approach to sound diffusion and an alternative way for audiences to participate in performances, Fields opens up unique forms of engagement within live musical events. Fields has been publicly performed numerous times to international audiences in the UK, Germany, France, Finland, Portugal and Greece.

Sébastien Piquemal ([http://funktion.fm](http://funktion.fm)) is a computer engineer obsessively exploring the artistic capabilities of machines. With a double background in programming and sound design, he has created sonic and experimental web sites, and is the author of many music open-source libraries such as WebPd (Pure Data for the web).

Tim Shaw has worked internationally as a composer, performer, sound designer and researcher. Shaw’s compositional methods include field recordings, synthesized sounds and live electronics, providing a wide scope for creative diversity. He is currently studying a PhD in Digital Media at Culture Lab alongside managing Newcastle based record label Triptik.

**of the survival of images (2013)**
“of the survival of images” belongs to a larger ongoing work for music, video, and the moving body, called Studies in Movement. It draws inspiration from Henri Bergson, whose meditations on time, matter, and memory offer a philosophical framework for the multimedia experience. The piece features the GLOBE, my custom wireless music controller, an instrument I designed to capture performance gestures in order to control real-time synthesis and video. The video footage presents the image of my longtime collaborator, the South African dancer Ami Shulman. Together, my performance onstage and her performance onscreen form a
visual counterpoint that draws out, in sensory form, the ideas contained in Bergson’s text.

Butch Rovan is a media artist and performer at Brown University, where he co-directs MEME (Multimedia & Electronic Music Experiments). Rovan has received prizes from the Bourges International Electroacoustic Music Competition, the Berlin Transmediale International Media Arts Festival, and his work has appeared throughout Europe and the U.S. His interactive installation “Let us imagine a straight line” was featured in the 14th WRO International Media Art Biennale, Poland. Rovan’s research includes new sensor hardware design and wireless microcontroller systems. His writing is most recently featured in Mapping Landscapes for Performance as Research: Scholarly Acts and Creative Cartographies (Palgrave Macmillan, 2009).

WEDNESDAY, JUNE 3

Concert 3 7:30 PM | Shaver Theatre

Se-Lien Chuang, bass recorder/grand piano, interactive visuals,
Andreas Weixler, multichannel audio realtime processing

Circle Suite (Circle Squared, Circle Keys, Circle Self) (2011-2014)  Palle Dahlstedt

The Rush of the Brook Stills the Mind (2013)  Elainie Lillios
Scott Deal, percussion

Shawn Greenlee, granite lithophone, mallets, custom software

Jeu de modes/Tiresias (2013)  Andreas Bergsland & Robert Wechsler

Feedback Rings (2014)  The CREATE Ensemble
Muhammad Hafiz Wan Rosli, Karl Yerkes, Matthew Wright, Tim Wood, Hannah Wolfe, Charlie Roberts, Anis Haron, Fernando Rincón Estrada, computers
Momentum LSU (2015)
Fragments of memories (produced both by human beings and by computer) generate a synthesis of sounds and visuals. The sounds of live instruments serve as interface in an audiovisual interactive concert that merges a sophisticated instrumental sound and realtime computing in an amazing improvisation. While visual images and processes are being generated during the concert, a multi channel granular synthesis, spectral delays and virtuoso chances fit together minute tonal particles that make up the instrumental sounds into a constantly changing acoustic stream made up of different pitches, durations and positions in the electro-acoustic space. The musical and visual components interact and reciprocally influence each other in order to blend into a unique, synaesthetic, improvisational work of art.

Se-Lien Chuang composer, pianist and media artist, 1965 born in Taiwan, since 1991 residence in Austria. The artistic emphasis ranges from contemporary instrumental composition/improvisation, computer music, electronic sound processing up to audiovisual interactivity. Numerous international representation of compositions in Europe, Asia, North- and South America: Salzburger Festspiele, ICMC Athens/Perth/Ljubljana/Huddersfield/ NYC/Belfast/Copenhagen, NYCEMF NYC, SICMF Seoul, NIME New York, ISEA Singapore/Nagoya, IAMAS Japan, Ars Electronica Linz, SONORITIES Festival Belfast, among others.

Andreas Weixler born 1963 in Graz, Austria, is a composer for contemporary instrumental composition, computer music and audiovisual realtime processes. Contemporary composition diploma with Beat Furrer at the University of Arts in Graz.

Circle Suite (Circle Squared, Circle Keys, Circle Self) (2011-2014)
Circle Suite is a work in three movements for Disklavier player piano, controlled by the composer in three different ways. It is the result of an experiment into how to gesturally control an unstable generative system. The underlying agent-based system of four musicians is the same in all three movements. First, the feedback parameters are controlled through a set of pressure sensors using a novel vector-based mapping, with the controller placed on top of the piano. Second, the parameters are mapped from the pianist’s interactions on the very same piano that performs the output of the system. Finally, the system is left autonomously playing on itself through the very same mapping, seeded by pianist. The three movements follow each other without a break. This progression from an intimately controlled instrument to a set of co-musicians to an autonomous machine also raises questions about the relationship between the musician and his instrument, and about generative and performative
aspects of music. The individual movements have been previously performed, but this is the World Premiere for the whole suite.

**Palle Dahlstedt** (Sweden): Composer, pianist, improviser and researcher, with degrees in composition from the academies of Malmö and Gothenburg, and PhD from Chalmers University of Technology. His music has been performed on six continents and awarded several prizes (e.g., Gaudeamus Prize 2001). Alone and with duo pantoMorf, he has toured with AMM and played with improvisers such as Tim Perkis (The Hub), Gino Robair, Stephen Nachmanowitch, John Tilbury. As researcher, he develops new technologies for electronic improvisation and composition. He is currently Obel Professor in Art & Technology at University of Aalborg, and Reader in Computer-Aided Creativity, University of Gothenburg.

**The Rush of the Brook Stills the Mind (2013)**
The Rush of the Brook Stills the Mind for multi-percussion and live, interactive electroacoustics takes its inspiration from a poem with the same title by Wally Swist. The percussionist’s virtuosic foray through Swist’s evocative work pairs acoustic and electroacoustic forces into a single entity. The Rush of the Brook Stills the Mind was commissioned by percussionist Scott Deal.

The trail flashes with sluices of snow melt. Silver-green undersides

of hemlock lift in the wind. A warbler’s electric call climbs all the way

up the mountain slope. That hidden waterfall we promised to see

this spring unrolls bolt after bolt of runoff that splashes veils of watery lace

over stones. The canopy creaks with pine siskins. Mist rises above snow.

The aloneness almost too much for one man. The surge of the brook crashes

around boulders; a sink hole swirls and dips. Ripples cascade in a basin
under deadfall to plunge into a froth of torrent. A nuthatch debugs

a fallen branch that rocks in the current; and a mayfly is blown above the spray.

--Wally Swist from Huang Po and the Dimensions of Love, published by Southern Illinois University Press (2012). Reproduced with permission of the author. All rights reserved.

Elainie Lillios’s music reflects her fascination with listening, sound, space, time, immersion and anecdote. Her compositions include stereo, multi-channel, and Ambisonic works, instrument(s) with interactive electronics, collaborative experimental audio/visual animations, and installations. Recent awards include: 2013-14 Fulbright Scholar (Greece); First Prize 2009 Concours Internationale de Bourges, Areon Flutes Competition, and Electroacoustic Piano Competition; Second Prize 2014 Destellos International Competition. Grants/commissions from INA/GRM, Réseaux, ICMA, La Muse en Circuit, NAISA, ASCAP/SEAMUS, LSU’s CCT, etc. Acousmatic music available on Empreintes DIGITALes. Other works on Centaur, MSR Classics, StudioPANaroma, La Muse en Circuit, NAISA, SEAMUS, Irritable Hedgehog and Leonardo Music Journal. elillios.com

Substitutions (2014-2015)
Substitutions is inspired by a Chinese lithophone within the Museum of the Rhode Island School of Design’s Asian collection. Lithophones are ancient instruments, stones that vibrate and produce sound when struck. The RISD Museum’s lithophone is an L-shaped jade stone dating from 1761, created during the Qing Dynasty. The museum piece is not available to be handled. In order to explore and compose for this instrument, I have fabricated a close replica in granite for use as a percussive interface for sound synthesis and signal processing.

In the performance of Substitutions, a piezo transducer is fixed to the stone’s vertex between the drum and femur. The transducer’s signal is sent to custom software created in Pure Data. In software, two computational substitutions take place. First, a real-time sinusoidal analysis of the audio signal is conducted. This analysis is used to drive a re-synthesis procedure with an oscillator bank. Thus, spectral information is used to produce drifting, sustained tones initiated by and fluctuating with percussive actions. The second substitution is created via convolution reverb. Pre-recorded impulse responses from metallic percussion instruments are used to change the perceived material quality of the stone chime.
Shawn Greenlee is a composer and sound artist. Greenlee is Assistant Professor at the Rhode Island School of Design (RISD), and earned his Ph.D. in Computer Music and New Media at Brown University (2008). He has performed extensively across the United States and Europe, appearing on several conferences, festivals, and tours. These include NIME (2014, London and 2013, Daejeon), Re-new (2013, Copenhagen), ICMC (2011, Huddersfield and 2005, Barcelona), IN TRANSIT (2008, Berlin), and Elevate (2007, Graz), among several others. Greenlee’s discography spans over fifty releases to date, complemented by an active practice as an exhibiting artist and sound designer. http://shawngreenlee.com

Jeu de modes/Tiresias (2013)

In Greek mythology, Tiresias was a blind prophet of Apollo in Thebes, famous for clairvoyance and for being transformed into a woman for seven years. Jeu de modes/Tiresias is an interactive dance piece exploring different notions of seeing, moving and acting on the world. It explores ranges of dynamic in expressive gesture – from small discrete finger movements, via medium sized “conversational” gestures, to large, energetic swipes and explosive outbursts – and how these movements can be interpreted sonically. The piece is originally for three dancers, two male, one of whom is blind and in a wheelchair, and one female. The sound palette of the piece is based on hundreds of unique pre-recorded sound particles, which make up a rich amalgam of sound objects, differing greatly in quality and feel, and the degree to which they invite concrete associations and narratives. They are played one at a time or concatenated into short chains, dense clouds or roaring sound masses, depending on the dancers movements. The piece is realized using Motion Composer, a device under development designed to transform movement into music for persons with disabilities. It utilizes a combination of 2D and 3D camera-based sensor technology processed with custom-built software.

Robert Wechsler is a choreographer, dancer and developer of interactive methods of performing with technology, and has since the 1970s used body-worn electronics attached to the body. Director of MotionComposer and Palindrome, a pioneer in interactive and computer-assisted performance. Studied ten years with Merce Cunningham and John Cage. Received a Fulbright Fellowship and won first prize at the Berlin Transmediale for “best interactive art”.

Andreas Bergsland has been involved in composition for exhibitions, installations, large scale multi-media events, live-electronics performances, and interactive music for dance, and his work has been presented in Greece, Norway, Italy, Canada, USA, Germany and Denmark.
**Feedback Rings (2014)**

Ensemble Feedback is a structured musical improvisation, where a variable number of players excite and control a sparsely-connected feedback delay network. Each of our unique personal instruments manipulates a received audio input, and incorporates it into the output. A digital patching matrix creates various connection topologies among the ensemble by mixing the instruments’ outputs to form each instrument’s input. Towards transparency, we present visualization of connection topologies and of each instrument’s input/output (including spectrogram and estimates of I/O volume differential for quick and smooth timescales) to the audience.

Topologies with loops create feedback and can give rise to distinct behavior resembling a single group instrument, whose behavior vitally depends on each performer’s actions. As an ensemble, we explore several issues this raises. How do humans cybernetically adapt to these dynamic topologies? How to adapt our personal dynamics to the radical democratization of everybody’s sound going through everybody’s instruments and each member having a vital role with (some) total control at all times? What is the relationship between managing a complex system versus being managed by the system? How much control can we have over a densely-connected system? How do these challenges affect our musicianship?

**Muhammad Hafiz Wan Rosli** is a PhD candidate at the Media Arts and Technology program (UC Santa Barbara). He received a BFA in New Media from Universiti Sains Malaysia, and an MFA in Computer Art from the School of Visual Arts. His current research area includes visualization, sonification, spatial audio, auditory scene analysis, music information retrieval and synthesis techniques. He is also the CREATE Technical Coordinator.

**Karl Yerkes** develops audiovisual musical systems for ensemble performance using embedded and distributed technologies. As a PhD student at UCSB he works in the AlloSphere and the SYSTEMICS Lab. As Artist in Residence at the SETI Institute he collaborates with NASA scientists on multimedia works about the search for extraterrestrial life. His previous NIME publications include: disky (2010) and twkyr (2014).

**Matthew Wright** founded and directs the CREATE Ensemble at UCSB where he is also CREATE Research Director, Lecturer, Associate Researcher, and the AlloSphere’s Principal Development Engineer. His research focuses on interactive live performance. Previously he worked at CNMAT/UC Berkeley, CCRMA/Stanford, and MISTIC/University of Victoria. He has participated in almost every NIME conference including as a performer in Dublin; this year he is presenting his 22nd-25th NIME papers. He is perhaps best known in this community as co-inventor of Open Sound Control.
Tim Wood is currently a graduate student in the MAT program at UCSB, where he studies interactivity, algorithmic processes, and how new technology can relate to the body, nature, and the physical world.

Hannah Wolfe is pursuing her PhD in MAT at UCSB. Her research interests include physical computing, human robot interaction, bio-mimicry, interactive environments and technology education. She received her bachelor’s degree in Art Influenced by Math and Science from Bennington College.

Charlie Roberts explores human-computer interaction in creative coding and virtual reality environments. He is the primary author of Gibber, a creative coding environment for the browser, and has given over a dozen performances in the US, Europe and Asia live coding audiovisual art.

Anis Haron is a PhD candidate in MAT at UCSB. He received his MFA in Computer Art from School of Visual Arts, where he developed his interest in sound art. His research interests include synthesis techniques and music information retrieval.

Fernando Rincón Estrada is a Colombian composer based in Santa Barbara, California. His work is focused mainly on chamber music performance involving acoustic and mixed media performances. Rhythm and timbre are recurrent materials through his compositional work, and presently both sound spatialization and microtonality are research interests for the development of his creative work as well. At the moment he is a PhD student of the Music Composition program at UCSB. His music has been performed in the Netherlands, France, Austria, Mexico, Uruguay, Argentina, U.S. and Colombia.

Late Night Concert 3 10:30 PM | Varsity Theater

Conjuring the Machine (2014)                      Steven Kemper
        Steven Kemper, guitar

Blinky Gibberings (2014)                          Charlie Roberts
        Charlie Roberts

        Merche Blasco, Lobatus and Espongina

Conjuring the Machine (2014)
Conjuring the Machine conceives of TAPI (Transportable Automatic Percussion Instrument) as a “magical object” whose powers are unlocked
through a ritualistic performance on electric guitar. The piece consists of noisy, processed guitar mixed with slow, regular rhythms leading to faster passages of complex polyrhythm. Impulse and amplitude tracking of Ebow and plucked guitar textures generate an additional percussive layer that intertwines with slow, spacious rhythms and faster, complex syncopation.

Conjuring the Machine features a granular MIDI note generation technique that allows high-level control of onset time and amplitude (velocity) of sonic grains produced by short, rapid attacks on TAPI. This granular technique is used in two ways: First, the amplitude of Ebowed guitar is used to control the amplitude of all grains, directly controlling the volume envelope. Second, note lengths of picked notes on the guitar are mapped to envelope durations, allowing the granular texture to follow the performed guitar rhythms.

TAPI is a robotic percussion battery consisting of two woodblocks, two cowbells, and a chime built into a vintage 1970s briefcase. The instruments are equipped with contact mics that allow direct amplification and processing of the acoustic sound. TAPI was built in 2012 by Expressive Machines Musical Instruments.

Steven Kemper creates music for acoustic instruments, instruments and computers, musical robots, dance, video, and networked systems. His compositions have been presented at numerous concerts and festivals around the world. Steven is a co-founder of the musical robotics collective Expressive Machines Musical Instruments (EMMI), which is dedicated to designing, building, and composing new music for robotic instruments. Steven received a Ph.D. in Composition and Computer Technologies from the University of Virginia and is currently Assistant Professor of Music Technology and Composition in the Music Department at the Mason Gross School of the Arts at Rutgers University.

**Blinky Gibberings (2014)**

Blinky Gibberings uses recent research on pattern manipulation and representation in live coding performance practice. Using Gibber, a browser-based live coding environment, I create rhythmic and melodic patterns and sequence their subsequent transformations. These transformations are visualized in the source code itself, alongside visualizations of the phase of musical sequences and their triggered output. These various visualizations have the potential to illuminate the algorithmic processes at work during the performance.

Charlie Roberts is a Postdoctoral Fellow in the AlloSphere Research Group at UC Santa
Barbara, where his research explores human-computer interaction in virtual reality environments. He is the primary author of Gibber, a creative coding environment for the browser, and has given over a dozen performances in the US, Europe and Asia improvising audiovisual art through live coding.

**Electroacoustic improvisation with Espongina and Lobatus (2015)**
The performance will be an electroacoustic improvisation that I will perform myself with the two gestural controllers that I am presenting, Lobatus and Espongina, within my voice. The length of the performance will be between 10-15 minutes.

Trained as a Telecommunications Engineer, **Merche Blasco** developed in parallel a more creative path related with sound, video, installation and performance. Her research and practice revolves around Electroacoustic Improvisation, NIME and participatory sound performances. She has presented her performance work in Sonar Festival (Barcelona), Mapping Festival (Geneve), Sonic Art Circuits (Washington) and Queens Museum of Art (NYC) and sound installations in Dumbo Festival (NYC), Harvestworks (NYC) and Tsonami Sound Festival (Chile), among others. Thanks to a Fulbright grant she graduated from the MPS Interactive Telecommunications Program (ITP /NYU). She currently lives and work as a multimedia artist in NYC.
VI. INSTALLATIONS
String Section transforms a selected wall into an interactive musical instrument. It is made of thirty-six individual geometric symbols that audience can hold a mobile device over to produce different sounds, in this case, orchestral strings at different pitches. The audience can create their own musical scores alone, or with others using multiple mobile devices.

The work is made of thirty-six geometric symbols spread evenly across a wall in three rows of twelve. Each row represents the same octave played further down or up the scale; the lower row is the octave played down the scale (low sounding notes) the middle row is the octave played in the middle of the scale (mid range notes), and the upper row is the octave played up the scale (high sounding notes). This means you could move a mobile device up a column of geometric forms to hear the same note being played low, mid, and high. This arrangement is intuitive so no instructions are required in terms of music theory. From general observation and feedback the audience have been able to work it out very quickly with no prior knowledge of music. The geometric forms are the artists’ visual response to a particular musical note, or the interpretation of sound as shape and colour. Some describe this as synaesthesia or the mixing of the senses.

New Zealand artist Shannon Novak, a synesthete, posits that music is in everything. He creates compositions for objects, locations, and people much as musicians might compose for about places, persons or experiences with emotional resonance for them. Trained initially as a pianist, his practice encompasses painting, sculpture, and installation, with a focus on using geometric forms to explore and render his understanding of the interrelationships between sound, colour, form, time, space, and social context. Novak’s
installations and exhibitions have been seen in national and international institutions, festivals and public spaces, including Auckland Art Gallery Toi o Tamaki; The McKinney Avenue Contemporary in Dallas, Texas; The University of Auckland’s George Fraser Gallery; Pah Homestead and the Aotea Centre in Auckland City; and in New York City in 2013 as part of the Art in Odd Places Festival, on 14th Street and in Central Park.

**SUBTLE TERRITORY**

**DONNA LEGAULT,**  
UNIVERSITY OF OTTAWA

**LOCATION:**  
SHAW CENTER FOR THE ARTS

*Subtle Territory* transforms a public announcement system into an embedded instrument that manifests imperceptible sounds of the surroundings to reveal a liminal sonic field. Ambient noise is captured live by a sensitive microphone. Infrasonic and low frequencies are then isolated and extended across the audible range in real time using a custom Pure Data program. The resulting emergent soundscape transforms sonic resonances into an unfolding acoustic experience of everyday life. Near the limits of audible sound are vague acoustic territories above and below the boundaries of human hearing. Sounds that travel the furthest and have the most visceral affect are the lowest frequencies of our everyday spaces. These sonic spaces are teeming with environmental and increasingly with urban sounds that are just beyond our perception. This territory of low frequency sounds is continuously emerging around us. Defined by an acousma of atmospheric resonances that combine with the rumblings of traffic, machinery and public activity. *Subtle Territory* engages the public with the imperceptible sounds from their surroundings.

*Donna Legault* is an experimental artist based in Ottawa, Canada. Her cross-disciplinary practice includes sound art, electronic installation, sculpture, and performance. The intersection of these practices focus on the resonance of sound as a dynamic extension
of everyday actions. Her interest in the perception of sound draws participants’ attention towards the relational qualities of “noise” as a material and temporal presence. Donna Legault holds degrees in Art History from Carleton University, and in Visual Arts from the University of Ottawa. She is currently a professor of Electronic Arts at The Davis School of Art in Ottawa and The University of Ottawa. Donna has exhibited widely in solo and group exhibitions, festivals and conferences, including recent exhibitions at Send + Receive in Winnipeg, Subtle Technologies Festival in Toronto; Emmedia and Truck Gallery in Calgary; ISSTA Conference in Maynooth, Ireland and IMOCA in Dublin, Ireland. Upcoming exhibitions include the Messaros gallery at the University of West Virginia and the 2015 International Electronic Arts Symposium. Donna’s continuing practice is supported by residency opportunities and grants from The Ontario Arts Council and The Canada Council for the Arts.

THE 3D SOUND OBJECT:
DIRECT AND REFLECTED SOUND IN ACOUSTIC SPACES

MARGARET SCHEDEL,
STONY BROOK UNIVERSITY

PAUL GELUSO,
HARVESTWORKS

NAPHTALI DAFNA,
HARVESTWORKS

LOCATION:
FOSTER GALLERY

The 3D Sound Object installation uses a multi-directional speaker that can produce complex sound radiation characteristics. Set in a live acoustic space, the speaker system has the ability to play the room using reflective surfaces to create virtual sound sources for the listener. In this way, it uses the architecture of the space to create unique 3D sound sculptures. The system can model radiation characteristics of acoustic instruments, spatialize existing recorded sounds, and create new synthesized 3D sounds. For NIME 2015, we will play 3 compositions written specifically for the system. We are also open to allowing the attendees to play their
own sounds through our system at the end of every day.

Margaret Anne Schedel is a composer and cellist specializing in the creation and performance of ferociously interactive media whose works have been performed throughout the United States and abroad. While working towards a DMA in music composition at the University of Cincinnati College Conservatory of Music, her interactive multimedia opera, A King Listens, premiered at the Cincinnati Contemporary Arts Center and was profiled by apple.com. She holds a certificate in Deep Listening with Pauline Oliveros and has studied composition with Mara Helmuth, Cort Lippe and McGregor Boyle. She is a joint author of Electronic Music and recently edited an issue of Organised Sound on sonification. Her work has been supported by the Presser Foundation, Centro Mexicano para la Música y les Artes Sonoras, and Meet the Composer. She has been commissioned by the Princeton Laptop Orchestra and the percussion ensemble Ictus. In 2009 she won the first Ruth Anderson Prize for her interactive installation Twenty Love Songs and a Song of Despair. Her research focuses on gesture in music, the sustainability of technology in art, and sonification of data. She ran SUNY’s first Coursera Massive Open Online Course (MOOC) in 2013. As an Associate Professor of Music at Stony Brook University, she serves as Co-Director of Computer Music and is a core faculty member of cDACT, the consortium for digital art, culture and technology.

Paul Geluso’s work focuses on the theoretical, practical and artistic aspects of sound recording and reproduction. He is a sound recordist, mixer, and engineer who collaborates with musicians and media artists using sound as a creative medium. He has worked in many areas of sound and music production being credited as engineer, producer, composer, and musician on CD and 5.1 surround sound DVD releases in addition to film, video, sound installation, performance and broadcast television soundtracks since 1992. He is currently developing new ways to capture, mix, and process 3D audio for playback on multi-channel sound systems. This work will be presented at the 131st Audio Engineering convention in New York City. Prior to being full-time faculty at NYU, he taught classes in music production and technology at Bard College and the Peabody Institute in addition to directing the Stephen F. Temmer Tonmeister Seminar here at NYU. Geluso received a Bachelor of Science in Electrical Engineering from New Jersey Institute of Technology in 1988 and a Master of Music in Music Technology from New York University in 2000.
Sounding Box #11 is the first piece released by Caselden Studios in a series of interactive acoustic sculptures called Sounding Boxes. The Sounding Box sculptures are intended to produce ambient sound and allow viewers to explore control of this sound through different types of interaction. When first conceiving the Sounding Boxes sculptures, we drew some influence from Brian Eno’s definition of ambient music: “Ambient Music is intended to induce calm and a space to think… (it) must be able to accommodate many levels of listening attention without enforcing one in particular.” - Brian Eno (from liner notes of his album Ambient 1: Music for Airports) The Sounding Box sculptures are designed to generate that type of sonic ambience, to produce an environmental sound that complements the surrounding space. We call these “sculptures” because they’re not really instruments in the conventional sense. When a person interacts with these boxes, they’re not necessarily creating a performance that will “enforce” attention from people nearby. The sculpture generates a passive, calming sound… it’s an option for people nearby to listen actively, or to interact with the sculpture. This is part of what makes the Sounding Box experience exploratory in nature. Sounding Box #11 uses littleBits Electronics to respond to the viewer’s actions and control the sound. As viewers approach the piece and move in the surrounding space, they cast shadows in different locations, which causes the sculpture to generate different tones. The sculpture itself is acoustic and bears influence from some stringed instruments such as the guitar and the Japanese traditional instrument, the koto. Electromagnets built into the structure vibrate steel strings to produce the droning sounds, and littleBits light sensors control the electromagnets. The Sounding Box #11 project is sponsored by littleBits Electronics, Inc.
Caselden Studios is a new creative studio based out of New York City exploring sound design for spaces, and new, innovative approaches to music-making and sound generation. The studio is lead by its founder, MJ Caselden, and encompasses a team of wood and metal-workers, 3D modelers, and embedded systems developers. For more information about Caselden Studios, visit our website: www.caseldenstudios.com The founder, MJ Caselden, is a creative technologist, sound designer, and electronic musician. He has been making electronic music since 2005. MJ's artwork often explores new ways to control sound, incorporating custom interactive instruments and software. He has worked as an electronics design engineer for companies like Beats by Dre and littleBits Electronics in partnership with Korg, and his artwork has been featured in TimeOut NYC. His design work has ranged from wearable wireless biosensors for dancers, to robotic creatures controlled by drum machines. For more information about MJ, visit his website: www.mjcaselden.com littleBits Electronics, a startup located in NYC, offered sponsorship for Sounding Box #11, and contributed their product as the electronics design platform for the piece. For more information about littleBits, visit their website: www.littlebits.cc

CONDUCTING STUDIES

AVA ANSARI,
ARTIST

MARCO PINTER,
ARTIST

LOCATION:
GLASSELL GALLERY

Conducting Studies is an ongoing collaborative performance-based new media project involving mapping and rendering of music and spoken narratives, as tracked through the physical performance of orchestral conductors. The motion of the baton, as an extension of the body of the conductor, is sensed and programatically translated into motion data; and subsequently translated, via robotics, into various kinds of gestural prints and animations. The results show a complete loop from the music score on paper to its embodiment by the conductor’s body and back to its visualization on screen and paper. Since its beginning in 2011, the project has been exhibited in The Museum of Contemporary Art Santa Barbara (MCASB), in 2013, and the International Symposium on Electronic Arts (ISEA) in Dubai in 2014, as well as different lectures and public programs related to performance studies, digital and analogue
mapping and embodiment, in Santa Barbara, CalArts and New York University among others. The NIME presentation will be focused on “The Arabian Nights”, one of the oldest stories in history, with multiple supposed origins and a long history of collection, publication, translation, adaptations, and scholarship. The specific pieces used include Rimsky Korsakov’s Scheherazade, First Movement: The Sea and Sinbad’s ship, Om Kalthoum’s Alf Laylah wa layla, and Mohamed Abdel Wahab’s Alf Laila. The drawings on canvas and paper are produced by a robotic plotter which imitates the motion of the conductor. The LCD-based video is software-generated, based on tracked conductor motion.

Marco Pinter creates artwork and performances which fuse physical kinetic form with live visualizations. He has a PhD in Media Arts and Technology from the University of California, Santa Barbara, and an undergraduate degree from Cornell University. His work integrating choreographed robotic sculpture with graphics is supported by grants from the Interdisciplinary Humanities Center, the Santa Barbara Arts Collaborative, and the UC Institute for Research in the Arts. He has exhibited artwork and performances at cities around the world, including Dubai, New York, Montreal, Tehran, Hong Kong, Anaheim, San Diego and Santa Barbara. Wired magazine’s online UK site published a feature on Pinter’s work which explores perception through kinetic sculpture and graphics. Pinter is a contributing author to The McGraw Hill Multimedia Handbook and The Ultimate Multimedia Handbook. He has 10 issued patents and 27 pending patents, in the areas of live video technology, robotics, interactivity and telepresence.

Ava Ansari is an artist, educator, and curator. She is the associate curator of The Edge of Arabia US Tour, where she recently co-curated the Culturunners Storytelling Symposium hosted by MIT’s Art, Culture and Technology Program. She is the co-founder of The Back Room, a curatorial and pedagogical project that facilitates exchanges between artists and scholars in Iran and the US. Recent projects include, Open Relationship, an eight-week workshop developed in collaboration with CultureHub in New York, Sazmanab Center for Contemporary Art in Tehran, and Mani Studio in Isfahan; I Am Only a Reporter, an exhibition of later works by Ardeshir Mohassess, Modern Section of Art Dubai, 2014; A Call, a project conceptualized with Wafaa Bilal and eighty participating performers, which opened concurrently at Aaran Gallery in Tehran, and White Box in New York. As an artist, Ansari has presented work at ISEA2014, Dixon Place, La Mama, Eyebeam, the AC Institute, and the Museum of Contemporary Art Santa Barbara, among others. She holds a B.A. in Public Relations and Journalism from Allameh Tabatabaei University in Tehran, and an M.A. in Art Politics from the Tisch School of the Arts at New York University.
Boundary Synthesizer is an interactive audio-visual installation work that makes sound waves by analysis of the visual “boundary” of sceneries. Those sceneries come from various videos or real-time video input. The computer vision system detects the boundary lines of sceneries, such as cityscapes, sea waves and fireworks, automatically. This boundary line is extracted from the outline in each video frame and is directly transformed into the sound wave line. Users can manipulate parameters by turning knobs and pushing switches of the interface as with typical musical synthesizers. Thus, this installation is an audio-visual synthesizer in which the oscillator’s waveform is structured by the visual boundary. This synthesizer has 2 oscillators – 2 video images are encoded simultaneously. Users can enjoy playing with Boundary Synthesizer by changing video inputs, controlling the frequency of ring modulation and pressing switches that modulate both video and sound. Monotonous sounds are made from monotonous scenery; complex sounds are made from scenery with active movements, for example sea waves and fireworks. Users can experience the intuitive connection of scenery and sound.

Katsufumi Matsui is a Ph.D student in the Graduate school of Interdisciplinary Information
Studies at the University of Tokyo, Japan. His research interests include audiovisual installation and interactive art. He has received various awards, such as Asia Digital Art Award, 20th Campus Genius Award and the Digital Signage Award in Japan. His work has been presented at ICMC-SMC 2014. Seiichiro Matsumura is a composer, sound designer and interactive designer. He is Associate Professor of School of Design, Tokyo University of Technology. His interactive sound installation pieces were awarded several prizes such as Japan Media Arts Festival, Asia Digital Art Award and have been exhibited regularly in public museums in Japan. Tatsuya Ogusu is a Ph.D student in Global Information and Telecommunication Institute at Waseda University. His research interest is a method of composing contemporary music based on abstract paintings. Seico Okamoto is a graduate student in Space Direction Studio at Tokyo University of the Arts. Cuichi Arakawa is a Professor of Mechanical Engineering at the University of Tokyo.

PORTAL 1: A RIPPLING SPACE

RICK SNOW,
TULANE UNIVERSITY

LOCATION:
FOSTER GALLERY

Every physical object has an infinite number of natural resonant frequencies. This piece creates an interactive space for the exploration of a composite sonic topology composed of the frequencies found within three hanging cymbals. By moving 1 or 2 hands within the sensor space audience members can activate 1800 4 note collections of natural resonant frequencies found within the physical structure of the hanging cymbals and organized by the artist. Light reflected off the pool of water in which the cymbals are suspended visualizes the harmonic relationships presented. When not activated by an audience member the cymbals sing to one another autonomous improvisations derived from their memories of the audiences’ performances and from their own collection of atmospheric “songs”.

Rick Snow creates multi-modal artworks of sound and light. Custom interactive computer sound and projection mapping instruments and installations comprise his most recent work.
In this work he seeks to create situations in which audiences discover a complex “alien” generative system with its own memory and habits. These situations create an interaction between participant and work engaging the active memory and movement of both the participant and the system. His work has been performed/exhibited in many venues in the United States as well as selectively in Australia, Canada, Czech Republic, Germany, Ireland, Switzerland, and Wales.

NODE: A REACTIVE AUDIO/VISUAL INSTALLATION

MEASON WILEY, CALARTS

AMBER LEPLEY, CALARTS

LOCATION:
DIGITAL MEDIA CENTER

NODE is a reactive real-time audio/visual installation that focuses on cymatics, which is the study of visible sound and vibration. When vibration is passed through a physical excitatory medium, the relationships between minimum and maximum displacement are made visible, and complex fractal-like patterns emerge. The purpose of this installation is to show clear visible relationships between acoustic signals and modal phenomenon, allowing visitors to experience what is normally beyond their scope of vision. Additionally, we are striving to create a piece that is indicative of a sort of chaotic order within a controlled, inherently deterministic system. One that is both complex yet repeatable. In a way, the visitors become a larger part of that system. The more people interacting with the piece, the more complex and chaotic the installation becomes.

Meason Wiley is a multi-media artist, musician, sound designer, composer, and fabricator based out of Austin + Los Angeles. He received his BFA in Music Technology from CalArts in 2009. He is currently pursuing his MFA in Music Technology at CalArts under the guidance of Ajay Kapur and Michael Darling. His work focuses on sound visualization, generative art, organic modeling, physical computing, sculpture, digital fabrication, and the sonification of natural phenomenon.
Amber Lepley is a theatrical engineer and artist currently working out of Los Angeles. In 2012, she received her BFA in Theatrical Design and Production from Point Park University - Conservatory of Preforming Arts in Pittsburgh, Pennsylvania. She is currently pursuing her MFA in Technical Direction at CalArts under the guidance of Michael Darling and Paul DiPietro.

MUSICALCUBES

GUNNAR OLEDAL,
INTERACTIVE INSTITUTE
SWEDISH ICT, CHALMERS
UNIVERSITY OF
TECHNOLOGY

MICHAEL SCHADE,
INTERACTIVE INSTITUTE
SWEDISH ICT, CHALMERS
UNIVERSITY OF
TECHNOLOGY, CITEC -
UNIVERSITY BIELEFELD

LOCATION:
GLASSELL GALLERY

MusicalCubes is a collaborative interactive art installation for open spaces. It consists of eight illuminated semi transparent cubes, hanging from the ceiling in a 2 x 4 pattern. The users can interact with the installation in various ways. They can record their own sounds and transfer them between cubes in order to make a beat or melody in their desired way.

Michael Schade is an interaction designer, programmer, creative technologist and former student of the Chalmers University of Technology in Gothenburg. Most of his work revolves around explorative design, programming and the combination of art and technology. Originally from Germany, Michael studied Media Production with a focus on technology and arts in Lemgo, Germany. During that time he worked with various kinds of media and audio-visual technologies. He became extensively passionate for the maker/hacker and open source movement as well as all sorts of interactive and audio-visual technologies. Currently he is working as a researcher and interaction designer at the CITEC Institute in Bielefeld, Germany.
Gunnar Oledal is an inventor, artist and performer working in the intersection of novel technology and musical expression. With a background in computer science complemented by 2 years of music studies he’s currently doing his master thesis at Interactive Institute Swedish ICT where he is developing a completely new musical interface.

XYZ (NON-CONVENTIONAL VIRTUAL INSTRUMENTS BASED ON SPATIAL AND KINEMATIC MODELS)

IGNACIO PECINO,
THE UNIVERSITY OF MANCHESTER

LOCATION:
GLASSELL GALLERY

XYZ is an interactive installation proposing three non-conventional virtual instruments based on spatial and kinematic models to explore timbre, gesture and spatialisation. These models are implemented in a 3D simulation environment (Unity Game Engine), presenting emergent and recursive characteristics that minimise visual information while maximising the exploration of aural space, through gesture and motion. Sounds are procedurally generated in Supercollider using the incoming spatial and kinematic data from Unity via OSC messages. This approach reinforces the strong existing connection between the visual (gestural) and sonic aspects of these instruments. Multiple simultaneous users are invited to interact with the piece using custom software interfaces on touch-screen hardware devices, allowing them to explore the proposed sounds and instrumental techniques, in a collaborative performance/improvisation. These instrumental techniques were implemented as control methods (API) in the scripting language (C#), including random and generative elements that introduce a certain level of indeterminacy and variety into the system.

Ignacio Pecino is a composer, software developer and former sound engineer based in NOVARS Research Centre (The University of Manchester), where he is currently a PhD
candidate, after completing a Master with Distinction on Electroacoustic Music Composition. His research focuses on technical and fundamental aspects of dynamic audio, including procedural, adaptive and locative audio; but he is also interested in generative music, cybernetics (systems art), and perceptual organisation. His work has been presented in numerous international festival and conferences such as ICMC’13 (Perth), ICMC’14 (Athens), ZKM (Karlsruhe, Germany), AudioMostly’12 (Corfu) or MANTIS Festival (Manchester, UK).

Cloud is a constellation of cloudlets that were programmed through an all-age-appropriate workshop and as a result whose presence is a reflection of the community that made it. The cloudlets emit light and sound in response to light and sound generated by other cloudlets, people, and the environment. Each cloudlet’s aluminum honeycomb and acrylic vessel contains a Raspberry Pi microcomputer, light sensors, microphone, multi-color LEDs, and a small speaker that driven by Virginia Tech’s Pd-L2Ork free open source software. Through the use of community- and team-building workshops, participants grouped in teams each consisting of one to six members will be given an opportunity to uniquely customize the behaviors of cloudlets and place them in their final location under the artists’ aesthetic and technical guidance. There are four different heights of cloudlets, each with its own color and sound properties. As people walk in and out of the ensuing constellation, the sounds will be heard and lights perceived spatially from multiple heights and directions. Each cloudlet therefore manifests unique behavior and feeds off of each other’s sound and light as customized by the community participants. Cloudlets as a whole, form the Cloud, a reflection of the community that made them.
The art of multisensory researcher and artist Ivica Ico Bukvic (b. 1976) is driven by ubiquitous interactivity. Bukvic’s output encompasses aural, visual, acoustic, electronic, performances, installations, technologies, research publications, presentations, grants, patent disclosures, and awards. His most recent work focuses on communal interaction, audio spatialization, exploring connections among the arts and human health, and recontextualizing STEM K-12 education through innovative approaches to creativity and technology. Bukvic’s recent recognition includes L2Ork being named as one of the eight top research projects at Virginia Tech (DCist, 2014), AL Light & Architecture Design Award (New York, 2013), first place in the First International Laptop Orchestra Competition (Montana University, 2011), Excellence in Research and Creative Scholarship Award (VT CLAHS, 2011), XCaliber Award (VT, 2010), Best Animated Short (San Francisco, 2009), and the Creative Achievement Award (VT CAUS, 2009). Dr. Bukvic is currently an associate professor of music technology in Virginia Tech’s School of Performing Arts, where he serves as the founder and director of the Digital Interactive Sound and Intermedia Studio (DISIS) and the Linux Laptop Orchestra (L2Ork), Institute for Creativity, Arts, and Technology’s Senior Fellow, and a member of the Center for Human-Computer Interaction with a courtesy appointment in Computer Science. ico.bukvic.net

Aki Ishida is an Assistant Professor of Architecture at Virginia Tech and a Registered Architect in New York. Aki’s work is a synthesis of spatial uses of light, active public engagement of space, and critical examination of light in our cities. Her work ranges from design of interactive public art installations, writing on impact of electric light on our 24/7 temporality, to collaborating with hospitals to re-think the impact of light on healthcare. The environments and installations that she designs challenge the potentials of light, both natural and artificial, to represent and perceive the world around us in new ways. Interactive audio-visual installation Lantern Field, a project she led at the Smithsonian’s Freer Gallery in Washington, DC, was one of a dozen international winners of 2013 Architectural Lighting Design Award. In 2014, she served as panelist for the National Endowment for the Arts Art Works grants. Prior to forming Aki Ishida Architect PLLC in 2007, she was an associate for over four years at James Carpenter Design Associates, a studio focused on artistic and technical use of glass. She also worked at Rafael Vinoly Architects and I.M. Pei Architect. She holds architecture degrees from University of Minnesota and Columbia University.
REVERSIBLE REACTION

JASON CHARNEY,
BOWLING GREEN STATE UNIVERSITY

LOCATION:
GLASSELL GALLERY

reversible reaction is an interactive installation that takes its inspiration from the chemical phenomenon in which reactants and products can form each other, oscillating between chemical states. Contrasting sonic and visual environments create an abstracted microscopic world in this installation: molecular bonds join and break, atoms float in suspension, and the environment changes states when “catalyst” participants disturb the system’s equilibrium by moving around the space.

Jason Charney’s work in sound addresses the connection between science, observable phenomena, and performative gesture. He writes music for orchestral instruments and voice as well as electronics, often combining them. An active electroacoustic performer, Jason has a particular interest in multimedia and nonlinear sonic experiences. Jason is the recipient of the 2012 Allen Strange Award from SEAMUS and finalist for the 2015 SEAMUS/ASCAP Student Commission Competition. Recent activities include performances at the Centquatre Nef in Paris sponsored by IRCAM, the Music Academy in Zagreb, Croatia, sponsored by the US Embassy, NYCEMF, SEAMUS, SCI National Conference, N_SEME, and Electroacoustic Barn Dance. Jason holds degrees in composition and theory from Bowling Green State University and the University of Kansas, where he studied with Elainie Lillios, Mikel Kuehn, Christopher Dietz, Forrest Pierce, and Kip Haaheim. He is a regular contributor to I Care If You Listen, a blog and magazine about new music and technology and performs with electroacoustic improvisation trio Netmoiré.
WindChime is a web-driven audio-visual mixed/augmented reality work gathering weather data from thousands of world locations. The whole earth is sampled as a source of dynamic data; changes in the intensity and the direction of wind are captured, analyzed and visualized on an animated world map. Besides the connection to real-world data, WindChime features a parallel particle universe. Particles exist as a mass of interacting entities whose behavior is influenced by wind data. WindChime interfaces a real-world natural system with an engineered, cultural system. Particles coalesce into temporary clusters producing sounds – in analogy with a wind chime.

Peter Beyls is an interdisciplinary artist developing generative systems in music, the visual arts and hybrid formats. Beyls studied at the Royal Music Conservatory Brussels, EMS Stockholm, Ghent University and the Slade School of Art, University College London. He published extensively on the application of Artificial Intelligence for artistic purposes. Beyls holds a PhD in Computer Science from the University of Plymouth, UK and is currently a researcher at CITAR, Universidade Católica Portuguesa, Porto and visiting professor of Media Art at the School of Arts, University College Ghent.
Oscillations creates a field of tones using six Tibetan singing bowl robots, each carrying two singing bowls that produce pure sustained tones and striking single notes, filling the room with an omnipresent series of harmonics. In contrast, oscillating cymbals produce an earthy, gritty and urgent intervention, marking out the sound field in a dynamic manner. The Singing Bowl robots are played by a Brownian motion algorithm running in processing which sends commands for either bowl playing or striking over a wireless mesh network to the robots. This creates and ever changing soundfield. When exhibited in a gallery the sound field is omnipresent and listeners can sit in the gallery and enjoy the experience of being immersed within the instrument and hearing the sound field change around them. The instruments can also be used for processional performances either by rehearsed performers or by the general public/conference attendees, where simple instructions are given as to how to listen and walk and the robotic instruments are carried by the performers through spaces/crowds etc. Oscillations was devised and designed by Garth Paine with production assistance from research assistant Michael Krzyzaniak.

Garth Paine is a professor of Digital Sound and Interactive Media at the School of Arts Media and Engineering and Digital Culture program at Arizona State University. He has created interactive responsive environments where the inhabitant generates the sonic landscape through their presence and behavior and composed many music scores for dance works, generated through realtime video tracking and bio-sensing. He was awarded a Green Room Award for Outstanding Creativity, for Escape Velocity (Company in Space) and was a finalist for the Best new Musical Score for Dance, 2014. His work has been shown across the globe. Dr Paine established and directed the Virtual, Interactive, Performance Research environment (VIPRe) and is internationally regarded as an innovator in interactivity for experimental music and performance. His scholarships ranges from leading the Taxonomy...
of Interfaces for Electronic Music performance (TIEM) project with partners McGill and the EMF, producing an online database of NIME practices, to papers on interaction and somatics. His performance work acts as a platform for research into NIME. He has performed at, ISEA2013, Edinburgh Festival, Luxembourg Choreographic Centre, MOCO Paris, Macedonia Summer Festival, Dance Massive, Ear to the Earth Festival, - John Cage Centennial Festival - NYC, (2012) and has performance throughout Europe and the USA in 2015.

CITYGRAM

TAE HONG PARK, (PROJECT LEAD)
ANDREW T. PHILLIPS
SAMUEL C. MINDLIN
MICHAEL MUSICK
EVAN KENT
TORIN GELLER
GEMMA PEACOCKE

Citygram aims to deliver a real-time visualization/mapping system focusing on non-ocular energies through scale-accurate, non-intrusive, and data-driven interactive digital maps. The first iteration, Citygram One, focuses on exploring spatio-acoustic energies to reveal meaningful information including spatial loudness, traffic patterns, noise pollution, and emotion/mood through audio signal processing and machine learning techniques. Citygram aims to create a model for visualizing and applying computational techniques to produce metrics and further our knowledge of cities. The project will enable a richer representation and understanding of cities defined by humans, visible/invisible energies, buildings, machines, and other biotic/abiotic entities. Our freely Internet-accessible system will yield high impact results that are general enough for a wide range of applications for residents, businesses, and visitors to cities.

Tae Hong Park is a composer, bassist, and music technologist. He received his Bachelor of Engineering degree in Electronics from Korea University in 1994 and has worked in the area of digital communication systems and digital musical keyboards at the LG Central Research Laboratory in Seoul, Korea from 1994 to 1998. He also holds degrees from Dartmouth College (M.A. in Electro-Acoustic Music) and Princeton University (M.F.A and Ph.D. in composition). His current interests are primarily in composition of electro-acoustic and acoustic music, technical research in multi-dimensional aspects of timbre, pattern recognition, signal processing, automatic musical instrument classification, and computer-aided music analysis.
VII. WORKSHOPS
BEAGLERT EMBEDDED AUDIO WORKSHOP

WORKSHOP INSTRUCTOR(S):
ANDREW MCPHERSON,
QUEEN MARY UNIVERSITY
OF LONDON
VICTOR ZAPPI,
UNIVERSITY OF BRITISH
COLUMBIA

This daylong workshop will feature hardware hacking and audio programming using BeagleRT, a new ultra-low-latency real-time instrument creation platform for the BeagleBone Black single-board computer. Each participant will use a D-Box “hackable instrument” based on BeagleRT, beginning by modifying and circuit-bending the hardware. In the second half of the workshop, participants will write new audio code for the instrument, creating their own sounds and playing techniques. Together these activities will show how to create completely new digital musical instruments using BeagleRT. The platform is fully open source; no fee is needed to participate but participants will have the option to buy hardware to keep after the workshop.

A NIME PRIMER

WORKSHOP INSTRUCTOR(S):
MICHAEL LYONS, RITSUMEIKAN UNIVERSITY
SIDNEY FELS, UNIVERSITY OF BRITISH COLUMBIA

Attending NIME for the first time can be an overwhelming experience. Beginners may find it difficult to make sense of the vast array of topics presented during the busy program of talks and posters, or appreciate the significance of the wide variety of demos and concerts. This half-day tutorial is intended to provide a general and gentle introduction to the theory and practice of the design of interactive systems for music creation and performance. Our target audience consists of newcomers to the field who would like to start research projects, as well as interested students,
people from other fields and members of the public with a general interest in the potential of NIME. We aim to give our audience an entry point to the theory and practice of musical interface design by drawing on case studies from previous years of the conference. Past attendees of the tutorial have told us that they gained a helpful perspective that helped them to increase their understanding and appreciation of their first NIME.

**CLOUD**

**WORKSHOP INSTRUCTOR(S):**
IVICA BUKVIC, VIRGINIA TECH
AKI ISHIDA, VIRGINIA TECH

We propose a constellation of 18 cloudlets that were programmed through an all-age-appropriate workshop and as a result whose presence is a reflection of the community that made it. The cloudlets emit light and sound in response to light and sound generated by other cloudlets, people, and the environment. Each cloudlet’s aluminum honeycomb and acrylic vessel contains a Raspberry Pi microcomputer, light sensors, microphone, multi-color LEDs, and a small speaker that driven by Virginia Tech’s Pd-L2ork free open source software. In its original iteration workshop participants from Arlington businesses, organizations, and schools customized the behaviors of each cloudlet. Cloud grew cumulatively as more people partook in its making and activation. We envision the same process at NIME conference.

Through the use of community- and team-building workshops, 18 teams, each consisting of one to six members will be given an opportunity to uniquely customize the behaviors of cloudlets and place them in their final location under the artists’ aesthetic and technical guidance. There are four different heights of cloudlets, each with its own color and sound properties. As people walk in and out of the ensuing constellation, the sounds will be heard and lights perceived spatially from multiple heights.

and directions. Each cloudlet therefore manifests unique behavior and feeds off of each other’s sound and light as customized by the community participants. Cloudlets as a whole, form the Cloud, a reflection of the community that made them.

**CRAFTING COMPUTATIONAL PERCUSSION WITH EVERYDAY MATERIALS**

This studio-type hands-on workshop invites participants to create percussion instruments with everyday materials such as paper, cardboard, bottles, and foam, using our Rhythm Board to connect sensors, servos, and solenoids. We plan to use the NIME workshop to design a creative pedagogical method that motivates novices to understand basic electronic and computing concepts, and to provide an engaging musical experience. We encourage participants to bring everyday materials they want to explore; we will provide sensors, actuators, and a custom microcontroller as well as more materials participants can use together. The workshop is in multiple phases. Participants start by exploring unique sounds of diverse materials. Then they integrate mechanical movements (rack and pinion, crank, and Geneva drive) using servos and solenoids, and analog sensors (light sensor, IR sensor, pressure sensor, and potentiometer) with the Rhythm Board to control the speed of the servo movements, generating scratching, shaking, and tapping motions. Finally, participants will share their prototypes and discuss the potentials and challenges of this playful learning medium.
LEARNING TO PROGRAM HAPTIC INTERACTIONS USING MAX: APPLICATIONS WITH SOUND

WORKSHOP INSTRUCTOR(S):
EDGAR BERDAHL, BERDAHL INNOVATIONS
ALEXANDROS KONTOGEORGAKOPOULOS, CARDIFF SCHOOL OF ART AND DESIGN

In this workshop, participants will learn how to program force-feedback haptic interactions in Max for making music. During the workshop, each participant will borrow a FireFader haptic device with the option of purchasing it at the end of the workshop.

When programmed in Max, audio signal flow is typically primarily unidirectional (top to bottom). In contrast, programming force feedback typically involves bidirectional audio-haptic signal flow between virtual physical elements. For this reason, programming haptic force feedback can seem daunting at first because it requires a physical way of thinking. This workshop aims to get participants easily up to speed by examining simple example haptic interactions in the familiar Max programming environment. Many of these examples are based on physical models and leverage Max’s palette of visualization objects to help communicate the means of operation to participants. More advanced examples help provide participants with specific insight into how haptics can be integrated into novel music compositions and sound art.
CITYGRAM

WORKSHOP INSTRUCTOR(S):
MICHAEL MUSICK, NEW YORK UNIVERSITY
TAE HONG PARK, NEW YORK UNIVERSITY

This workshop will focus on the capture, analysis, and real-time music compositional capabilities afforded by current work in soundscape research through the Citygram (CG) Project. The workshop will offer a hands-on session following an overview of the CG Project which will present its approaches to soundscape and acoustic ecology research, overview of our comprehensive cyber-physical sensor network, and potentials for exploration of musical, creative, and spatial analysis using real-time and historical spatio-acoustic data streams. The session will then be followed by a comprehensive introduction to how real-time soundscape data can be used within a variety of real-time music systems.

DIGITAL STOMPBOX DESIGN USING SATELLITE CCRMA

WORKSHOP INSTRUCTOR(S):
EDGAR BERDAHL, BERDAHL INNOVATIONS
ESTEBAN MAESTRE, MCGILL UNIVERSITY

This workshop will help jump-start each participant’s journey into the wild world of imagining and realizing new ways of interacting with and creating digital audio effects. By the end of the workshop, each participant will customize an effect using a take-home stompbox that is stage-ready. Beginning and intermediate participants will benefit primarily from being led through a series of basic exercises in using the stompbox, while advanced participants may be most interested in discussing how to extend the functionalities of the stompbox via embedded Linux.

The workshop is based on open-source software and open-source hardware, so the possibilities are limited only by the imagination. The stompbox contains Satellite CCRMA featuring Arduino and the Raspberry Pi as well as knobs, buttons, footswitches, some other sensors, and an acrylic enclosure. Interested participants could later customize the template for the enclosure and laser-cut their own enclosure using a mail-order service.
MAKING MUSIC WITH ROBOTIC INSTRUMENTS

WORKSHOP INSTRUCTOR(S):
TROY ROGERS, EXPRESSIVE MACHINES MUSICAL INSTRUMENTS
STEVEN KEMPER, MUSIC DEPARTMENT, MASON GROSS SCHOOL OF THE ARTS,
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
SCOTT BARTON, HUMANITIES AND ARTS DEPARTMENT, WORCESTER POLYTECHNIC INSTITUTE

Musical Robotics combines many of the technical skills relevant to NIME participants, including mechanics, electronics, hardware and software design, as well as musicality. In this half-day workshop, Expressive Machines Musical Instruments (EMMI) co-founders Troy Rogers, Scott Barton, and Steven Kemper will guide participants through a hands-on workshop that will focus on all areas of designing a robotic musical instruments. Using EMMI-designed kits, participants will build and program a simple percussion robot, as well as get a chance to compose a short piece for this new instrument. At the end of the workshop, all of the pieces will be shared in a mini-concert. In addition to the hands-on portion of the event, the presenters will discuss the history of robotic instruments as well as provide a survey of contemporary practitioners in the field. They will also discuss more advanced topics related to robotic instruments, including human-robot interaction, electroacoustic hybrid instruments, and compositional aesthetics.

PERFORMING WITH NIMES

WORKSHOP INSTRUCTOR(S):
HANS LEEUW, UNIVERSITY OF THE ARTS UTRECHT / CERENEM UNIVERSITY OF HUDDERSFIELD
PIERRE ALEXANDRE TREMBLAY, CERENEM – UNIVERSITY OF HUDDERSFIELD
PALLE DAHLSTEDT, AALBORG UNIVERSITY, DENMARK / UNIVERSITY OF GOTHENBURG

Requires Work Submission. Submission Details will be coming shortly.

This is a proposal for a workshop on using instrumental NIMEs in performance. The goal of the workshop is to effectively share knowledge, skills and methods between virtuoso and experienced musicians and possibly educators in live electronic music performance. We are especially interested in those aspects of performance that can or should
be influential to the design of instrumental NIMEs, or better even, have been part of such a design process already. The workshop will culminate in a proposed performance at the NIME conference aimed at letting the audience experience the expressive qualities that are the target of this workshop.

The content of the workshop is proposed by the participants of the workshop and will be moderated and added to by the three proposers of the workshop. The participants of the workshop are subjected to a selection process in which both the level of virtuosity and the proposed content for the workshop are judged. The proposers of the workshop will add their own content and reshape participants content in order to have a coherent full day workshop. A performance will be the outcome at the conclusion of the workshop.

Application format: Potential participants must contribute two things:

1. A recording (preferably a video) of the applicant performing with his or her intended setup in preferably a collaborative musical environment that shows both the performers experience and musical intention.

2. A proposal for a workshop contribution (exercise(s), mind set, improvisation rule set etcetera) that addresses one of the following points: a. Collaborative music making in a live electronic context. b. Virtuosity on NIMEs. c. The link between performance and instrument design. The workshop contribution should involve active participation from the workshop participants. If you want ‘homework preparation’ to be part of the workshop proposal you are allowed to do so.

Workshop participants should see their contribution as an exchange and a means to further the development of NIME in the direction of performance. Although we want to showcase the workshop with a performance at NIME, and think that this is a necessary part of the whole setup; we do not want performers to apply because of the (extra) playing opportunity that is provided, although they should enjoy it, of course.
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