**Music 223M: Sound, Structure, and Machines**

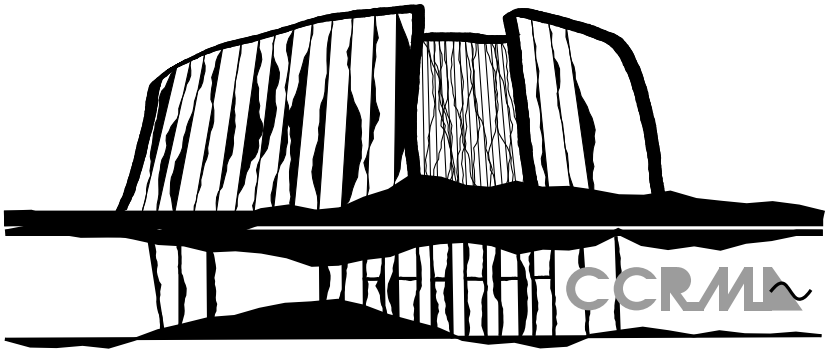
The goal of 223M was to develop a concept and practical framework for a group concert of up to twenty active participants. This was an ambitious and challenging project, given the short period of time and the complexity of the problem. We approached this by reducing options. We only used MaxMSP and started with an empty Max patch. We defined what we would like to do and discussed the artistic goals of the project. Then we step by step built the necessary infrastructure for our performance. This included developing basic yet unique and expressive synthesis tools, pattern generators, and interfaces needed to control those in a performance situation. We talked a lot about what we wanted to achieve, and how we could do this with the least possible effort. As a result students learned how to plan a larger project, how to make best use out of limited resources and how much complexity can arise from combining very basic elements in a thoughtful way. The musical scope of this project was open and depended on what we agreed on as a desirable result. As an initial hypothesis we assumed it would contain (potentially polyrhythmic) percussion elements, and complex evolving textures. We also aimed at presenting the concert as a surround sound experience, which included discussing the reasons and goals behind the usage of multichannel audio in our specific context.

Music 223M was led by Robert Henke, the Mohr Visiting Artist for 2013 by the Stanford Department of Music. Special thanks to Nancy and Larry Mohr for their generous support of the Mohr Visiting Artist program, administered by the Stanford Arts Institute.

*All electronic sounds in this concert are diffused through a 3D dome of 24 speakers arranged in three rings of 12, 8 and 4. At the heart of the system is one of our silent workstations running the free software Fedora GNU/Linux operating system and Planet CCRMA packages, and driving the speakers through an ethernet connected 32 channel AudioStreamer Mamba D/A A/D box. Custom software running in SuperCollider coordinates audio routing and speaker calibration, and Ardour (a free software digital audio workstation) is used as a mixer and diffusion engine. Pieces can connect directly to the speakers or go through a 3rd order Ambisonics decoder matched to the speaker rig and designed using Aaron Heller's vtd software package.*

No food, drink or smoking is permitted in the building.
Cameras and other recording equipment are prohibited.
Please ensure that your pager, cellular phone and watch alarm are turned off.
http://ccrma.stanford.edu/concerts/

Department of Music Stanford University




# Spring Concert

2013

Bing Studio May 28, 2013, 8:00 PM

# PROGRAM

**The Machine** (2013) — Music 223M
*a generative realtime soundscape created by students of Robert Henke's class M223.*

**Dialogue** (2013) — Reza Payami
*for violin, voice, disklavier piano and computer*

Emily Graber (violin)
Cecilia Wu (voice)
Tim O'Brien (wii-mote)
Reza Payami (electronics)

**Visual Cortex Quartet** (2013) — Nik Sawe

**Plane** (2013) — Alexandra Hay
*for vibrating motors, thunder sheet, and wave field array*

**Superimposition** (2013) — Tim O'Brien

**Violin Phase** (1967) — Steve Reich
*for multi-channel pre-recorded tape and violin*

Emily Graber (violin)

**More_Cogs** (2013) — Myles Borins

**Bruits pour Chanforgnophone** (2013) — Romain Michon
*for tenor and chanforgnophone*

Romain Michon (voice, chanforgnophone)
Tim O'Brien (chanforgnophone)

# ABOUT THE ARTISTS (continued)

**Reza Payami** is a software engineer / musician interested in real-time human-computer interaction and signal processing. He is studying for Master's degree in Music, Science and Technology at CCRMA and previously completed his MS in software engineering and MA in composition.

**Nik Sawe** is a 3rd year PhD candidate in Stanford's Emmett Interdisciplinary Program in Environment and Resources. With a background in neuroscience, he uses neuroimaging via fMRI to understand how people route information and make decisions on environmental issues ranging from natural resources valuation to appliance consumer purchasing to climate change risk perception.

Originally from Beijing, **Cecilia Jiayue Wu** (AKA: Xiao Ci) is a music director, composer, vocalist, arranger, and improviser as well as an audio engineer. Cecilia earned her Bachelor's of Science degree in Fashion Design and Engineering in 2000. Upon winning the MTV Asian Beat amateur band contest with her band, Universal Music identified her talent and signed her as a music producer and songwriter in Hong Kong. Her professional career continued with EMI Music. A frequent commuter between Beijing and Hong Kong ever since, Cecilia has been involved in virtually every aspect of music production from songwriting and studio engineering to talent identification, licensing and management. Currently, Cecilia is a second year master's student in the Music, Science and Technology program at the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University where she focuses on computer-generated music, computer-assisted composition and audio engineering. Cecilia also serves as a researcher and international coordinator at the Shangri-La Folk Music Preservation Association. As a musician, she received an award from the California State Assembly for her contributions as a positive role model in sharing Chinese culture.

## ABOUT THE ARTISTS (continued)

**Alexandra Hay** is a San Francisco-based composer and intermedia artist. Her work often explores change: shifting relationships between words, objects and bodies. Born in New Zealand, she studied music composition at the New Zealand School of Music, and musicology at the FU in Berlin, and is currently a third-year DMA student at Stanford University.

She has been lucky enough to work with Stroma (NZ), Duo Stump-Linshalm (Austria), Ensemble Offspring (Australia), JACK Quartet, Beta Collide, and Talea Ensemble (USA), and in festivals including Nuovi Spazi Musicale (Italy) Out Hear 2012 (London), and the ISCM World New Music Days. You'll find her clarinet duo Part/s in the catalogue of Waiteata Music Press.

**Fernando Lopez-Lezcano** enjoys building things, fixing them when they don't work, and improving them even if they seem to work just fine. The scope of the word "things" is very wide, and includes computer hardware and software, controllers, music composition, performance and sound. His music blurs the line between technology and art, and is as much about form and sound processing, synthesis and spatialization, as about algorithms and custom software he writes for each piece. He has been working in multichannel sound and diffusion techniques for a long time, and can hack Linux for a living. At CCRMA, since 1993, he combines his backgrounds in music (piano and composition), electronic engineering and programming with his love of teaching and music composition and performance. He discovered the intimate workings of sound while building his own analog synthesizers a very very long time ago, and even after more than 30 years, "El Dinosaurio" is still being used in live performances. He was the Edgar Varese Guest Professor at TU Berlin during the Summer of 2008.

**Romain Michon** is a first year PhD student at CCRMA. After graduating from two bachelors in Musicology and Computer Science in Ireland and in France, he completed a Masters degree in computer music at the university of Lyon (France). He worked as an engineer in several research center in computer music such as the Institut de Recherche et Coordination Acoustique/Musique(IRCAM), the Groupe de Recherche en Acoustique et en Musique Electronique (GRAME) and the Centre Interdisciplinaire d'Etudes et de Recherches sur l'Expression Contemporaine (CIEREC). Romain research interest mainly focus on digital signal processing, mobile platform and web-technology for music.

**Tim O'Brien** is a masters student at CCRMA with a keen interest in all things acoustic, technological and musical. His most recent projects involve algorithmic composition, computer improvisation, and spectral audio effects. Prior to CCRMA, Tim composed and performed in New York in various music groups. He holds a B.S. in physics from the University of Virginia.

## PROGRAM NOTES

**The Machine** (2013)

*The Machine* is not a concert but rather a constantly changing installation, composed of several sound & structure generators, built by the students using the programming environment MaxMSP. The aesthetic goal of the machine project is the creation of a sound environment that behaves like a big, moving and alive technical structure. The task includes considering not only technical aspects of the creation and interaction between several smaller systems but more important also decisions about the artistic implications.

The Machine has no beginning and no end, it just runs.

*Members of the 2013 CCRMA 223M course and contributors to **The Machine** included:*

Myles Borins, Gina Collecchia, Lauchlan Casey, Luke Dahl, Charlie Forkish, Alex Hay, Holly Herndon, Pablo Castellanos Macin, Tim O'Brien, Caleb Rau, Mayank Sanganeria, Dan Somen, Thomas Walther, Wiley Webb, Kurt James Werner and Carr Wilkerson.

**Dialogue** (2013)

"Dialogue" is a piece for violin, voice, disklavier piano and computer, based on granular synthesis and live input sampling. Different granulized sound sources virtually move in space by iPhone. The disklavier is controlled by wii-mote gestures, utilizing cellular automata and Rob Hamilton's customized *q3osc* game engine.

**Visual Cortex Quartet** (2013)

The notes you hear are entirely the output of neural activity in a subject's visual cortex, as they view a stimulus designed for retinotopy (mapping of the visual field). Using R and Java, Nik encoded the brain signal information into the music of a string quartet. As the piece progresses, listeners move to different locations in the visual cortex: locales that map information from the center of the visual field are represented by lower pitches and played by the cello, with progressively more peripheral regions played by the viola and violins. The piece accelerates and decelerates in sync with the playback of the retinotopic stimulus. This piece lays the foundation for building an orchestral soundtrack for a film from a viewer's neural response, a project to be conducted at CCRMA over the summer and fall.

**Plane** (2013)

For vibrating motors, thunder sheet, and wave field array. *Plane* is spatialized live using a custom iPad controller built by fellow classmate Charlie Forkish.

## PROGRAM NOTES (continued)

**Superimposition** (2013)

*Superimposition* is an exploration of natural and unnatural spaces. Native ambisonic field recordings in and around the Knoll at Stanford are augmented with Bill Schottstaedt's artificial bird and insect sounds, as well as various stereo field recordings. Movements in spaces which are at times overtly rhythmic and composed are juxtaposed with the harmony, rhythm, and musicality of the natural spaces around us. The fluid transformation from space to space induces a unique aural perspective such that the everyday noises around us may become novel.

**Violin Phase** (1967)

*Violin Phase*, by Steve Reich, was written in 1967 for violin and pre-recorded tape or four violins. The texture is created by the gradual phasing of a single phrase that loops continuously throughout the piece. By the end, three violins (or tapes) sustain the phased incarnations of the phrase while the fourth violin highlights the resultant melodies. This performance also features spatialization in 24 channels.

**More Cogs** (2013)

*More_Cogs* is a piece inspired by two classes from this quarter Music 222 taught by Fernando Lopez-Lezcano and Music 223 taught by Robert Henke. All of the sounds heard have been created using granular synthesis, specifically Robert Henke's granulator max4live plugin. My process involved granulating a sound, performing with the created sound using a number of voices, applying various delays, and finally filtering the result. The process itself was iterative, taking the results and using them to create new sounds. Throughout the process the granulator settings were never saved, nor do I recall exactly what original source files were used. As such, the sounds that you hear in *More_Cogs* would be impossible to reproduce.

**Bruits pour Chanforgnophone** (2013)

A Chanforgne is a Gaga word (dialect of the Auvergne region in France) that designates any kind of device making loud and unpleasant sounds. The Chanforgnophone is a new musical instrument that I built in the frame of Music 250b last quarter. It can be plucked, stroke, shaken and controlled by a bar of proximity sensors placed on one of its edges.

*Bruits pour Chanforgnophone* was written for this instrument which requires two performers and a singer. One of the performer sings and controls the sound effects (that are mostly analog) using the sensors and the other performer plays with the instrument itself. The piece is based on Jacques Attali's famous book: Noise: The Political Economy of Music that depicts music as the mirror of the Society. He explains how music was standardized to become a reusable material like any other commercial product, providing a rough picture of the western society and its capitalist system. In the piece, the Chanforgnophone is the metaphor of this society where various kind of sonic materials interact and morph with each other to form what Attali calls noise: the sound of men. The lyrics for the singer are based on excerpts of this book and supply an explanation to the music.

## ABOUT THE ARTISTS

**Myles Borins** is currently pursuing a Master of Music Science and Technology at The Center for Computer Research in Music and Acoustics at Stanford University. He recently graduated from OCAD University with a BFA in Integrated Media with a minor in digital media studies. His work has been seen recently at NIME 2013, at the San Francisco Maker Faire 2013, at Interaccess Electronic Media Arts Center during the Handmade Music Festival and at OCAD University during the Graduate Exhibition where his latest installation *The Autonomous Speaker-Bot* received the OCAD Medal in Integrated Media.

**Emily Graber** studied violin performance and physics at the University of Michigan. She is currently a graduate student at CCRMA (Center for Computer Research in Music and Acoustics).

**Robert Henke**, born in Munich, Germany, builds and operates machines to produce art. Amazed and inspired by the constantly expanding possibilities of applied computer science and technology, Henke explores new territories between musical composition, performance and installation. Alongside diving deeply into aesthetic concepts, the creation of his own instruments and tools is an important and integral part of his artistic process.

His works are concerned with volume, power and impact, the tension between silence and noise, darkness and light, and about the exploration and manipulation of real and virtual spaces. They expose carefully shaped details and gradual changes of repeating structures in different time scales.

Henke is a pioneer of multichannel sound, using methods and systems like wave field synthesis and ambisonics to create situations of total immersion, expanding the sonic experience of his performances beyond of what can be reproduced at home.

During the last decade, Henke's artistic explorations more and more expanded from his initial focus on music towards the field of installation, both sound based and audio-visual. His installations, internet based audiovisual performances and concerts have been presented at Tate Modern London, the Centre Pompidou Paris, Le Lieu Unique Nantes, PS-1 New York, MUDAM Luxembourg, MAK Vienna and on countless festivals. Henke’s interest in the combination of art and technology is also evident in his contributions to the development of the music software 'Ableton Live'. Since Ableton’s founding in 1999, he has been central to the development of Live, which became the standard tool for electronic music production and completely redefined the performance practice of electronic music.

He writes and lectures about sound and the creative use of computers, and holds a professorship in sound design at the Berlin University of Arts.

For 2013 he was selected as Mohr Visiting Artist at the music department of Stanford University, where he has been teaching a class in computer music composition and performance.