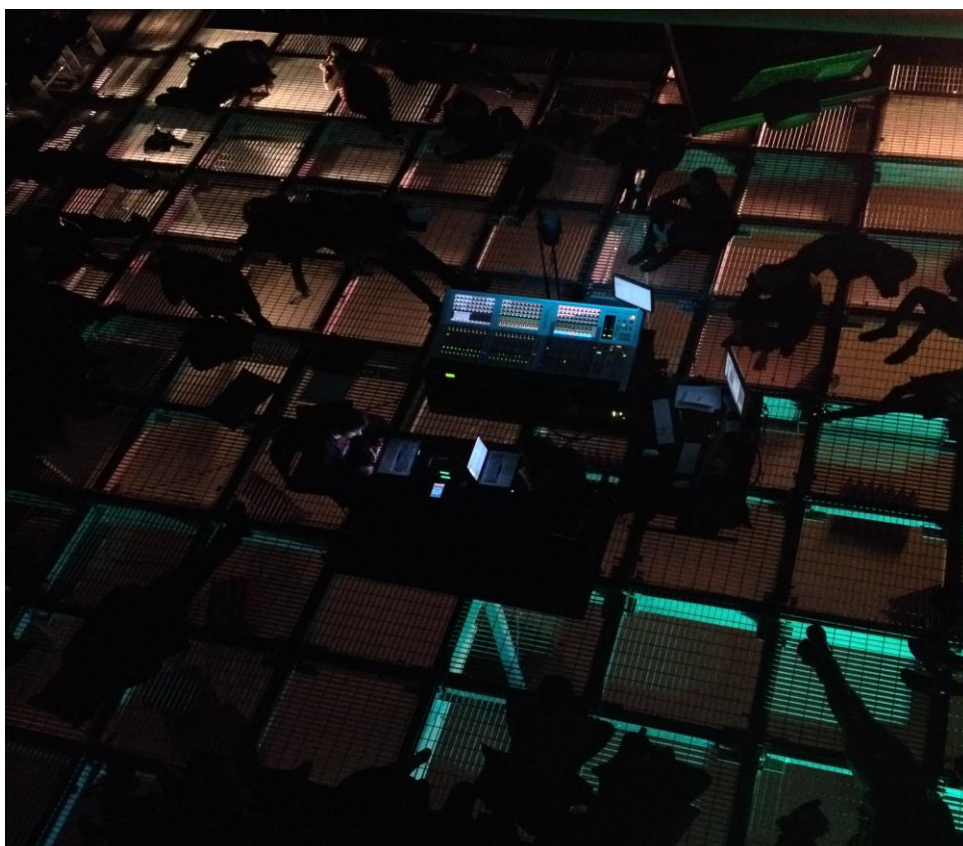




Sonorities Symposium
Techno–Human Encounters
21 April 2018
School of Arts, English and Languages



Queen's University Belfast



This symposium aims to provoke a conversation between artists, scholars, and scientists on the conference theme: Techno–Human Encounters. What do we mean by techno–human encounters today? How do changing conceptions of technology, body, life, and environment feed into experience and mediation of sound? And what can be the role of sound in techno–human encounters, especially at times of crisis and uncertainty? Taking its cue from these questions, and drawing on music, sound, media and mobile technologies, the symposium will explore errant and co-emergent aspects of human and nonhuman interactions.

The symposium is convened by Zeynep Bulut (QUB) and Kurt James Werner (QUB) as part of Sonorities Festival Belfast, and supported by the Sonorities Festival Belfast and the School of Arts, English and Languages at Queen’s University Belfast.

PROGRAM

All panels will take place in Room TR6 in the Graduate School

PANEL 1:

9.30am – 10.45am

Conor McCafferty (Queen’s University Belfast), “Sound mapping and pedagogy of urban sound”

Iris Garrelfs (Goldsmiths, University of London), “The listening wall: A journey into scored listening”

Jennifer Hsieh (University of Amsterdam), “Techno-auditory aesthetics: Reproducing noise as a heard object”

PANEL 2:

11am – 12:15pm

Adam James Wilson (City University of New York), “Improvising Music with Flawed Creative Software Agents”

Anna Xambo (Queen Mary University London), “Live Repurposing of Crowd-sourced sounds: Challenges and opportunities of using online repositories in music performance”

Andrew Watts (Stanford University), “What it means to be post human – An Exploration into Electronically Implanted, Augmented Voices”

LUNCH BREAK

(Graduate School, Social Space)

PANEL 3:

1:15pm – 2:30pm

Jean Beers (King's College London), "Does human to technology interaction shape the creative output and production of sound in a context of contemporary 'art music'?"

Jaime Oliver La Rosa (New York University), "Pierre Schaeffer, the instrument builder"

Joe Cantrell (University of California San Diego, University of San Diego), "The Human Object: New Materialist Models to Resist Obsolescence in Technological Sound Practices"

PANEL 4:

2:45pm – 4pm

Freida Abtan (Goldsmiths, University of London), "How to improvise with your past: an audio-visual journey"

Christopher Jette and Elliot Canfield-Dafilou (Stanford University), "The space in which sounds occur, an approach to environment-centric field recording"

Joel Rust (New York University), "Voice, after the anthropocene"

KEYNOTE LECTURE:

The Great Hall, Lanyon Building

4:30pm – 6:00pm

Brian Kane (Yale University), "In search of audile technique"

ABSTRACTS

In the order of the panels

Conor McCafferty, "Sound mapping and pedagogy of urban sound"

This paper explores a pedagogy of urban sound – that is, a practice of learning and teaching (about) sound in urban space – and considers ways in which sound maps can be useful interfaces in pursuit of such a project. Sound maps have been documented and critiqued by several scholars from different fields in recent years (Waldock 2011, Ouzounian 2014, Lin 2015, Droumeva 2017). In this part of my research, I am interested in how cities present numerous complex challenges relating to sonic experience, and how urban sound mapping assembles a range of web and audio technologies to engage with such challenges. The paper extends concepts that urban educators have deployed to engage people in critical examination of the places they live (Freire 2007/1968, Dobson 2006, Fraser 2009), presenting sound mapping as a potentially critical practice in that context.

I suggest that sound maps play a dual pedagogical role with respect to cities. First, sound maps can act as important archives of urban sonic experience, providing audible encounters with the numerous socio-cultural issues to be encountered in what we hear in our midst. Secondly, cities, in their variety of spatial forms and social agglomerations, pose useful problems for would-be acoustic cartographers that can be adapted to teaching and learning sonic concepts through sound mapping.

I explore these questions both within and outside a formal educational context. A group of architecture students found that their adaptation of sound mapping – using graphic illustrations and audio recordings – produced a practicable conception of sound relating to their project site in North Belfast. A study of web-based sound maps, meanwhile, suggests that they enact their pedagogy in multiple ways: by constructing a diverse theoretical and terminological corpus; by the autodidactic affordances of the web and audio technologies they deploy; and by their foregrounding of audio materials and listening.

Iris Garrelfs, “The listening wall: A journey into scored listening”

Listening has long been in the foreground of sound arts practice. In 1966, sound art pioneer Max Neuhaus stamped the word “LISTEN” onto the hands of participating audiences and took them on a walk around Manhattan, listening to industrial rumblings, buzzings of Puerto Rican street life and lastly, a percussion performance.

We currently live in divisive times, illustrated by Trump’s wall between the US and Mexico. In response, Listening Wall is a participatory project developed by the author, operating from the premise that the process of listening connects us with our surroundings. It consists of an actual wall filled with curated sound related instruction scores by artists such as Cathy Lane, Graham Dunning, Jez Riley French, Jo Thomas, Salome Voegelin, Viv Corringham.

Each of the scores provides a different sonic perspective through which to explore our surroundings. Some scores focus our attention on the experience of listening and the quality of the sound itself; others aim to instigate relationships with very specific aspects of the audible environment. Others stimulate our imagination or instill mischievous behavior, reminding us that listening does not merely relate, but can also be “... disruptive in its nature” (Westerkamp 2015). To date it has been set up in a range of different contexts, e.g. Supernormal Festival 2017 and Points of Listening #37. These different settings in turn offered different lenses onto how diverse audiences might engage with such materials.

Taking Listening Wall as a point of departure, this paper considers several questions relating to this project, including the problematics surrounding a tendency to normalize listening experiences, but also how we extract from or bring meaning to them. In between reduced (or material) listening and meaning-related (or immaterial) listening, our mental world alongside inherent assumptions and a wealth of creative possibilities becomes audible.

Jennifer Hsieh, “Techno-auditory aesthetics: Reproducing noise as a heard object”

When does a sound become noise? How does one communicate to others what is noise? In this paper, I examine how mechanical reproduction shapes the aesthetics behind hearing noise in Taipei, Taiwan. A unique feature of noise management in present-day Taiwan is the reliance upon techno-scientific evidence to verify a sound as noise. In Taipei, environmental inspectors are on-call 24/7, with a guaranteed response time of three hours, to answer to complaints of noise by urban residents. Under this system, decibel values, as measured by environmental inspectors and acoustic engineers, have become the gold standard for determining whether or not a sound legally counts as noise. This method frustrates Taipei residents, who have become dissatisfied by the tendency for decibel measurements to reduce noise to mere loudness. In turn, residents have started making their own audio and visual recordings to document the existence of a noise problem. Drawing upon ethnographic research from 2014-2015 in Taipei, I consider how the emergence of a techno-scientific regime of noise management transforms noise into an object that is doubly aestheticized as a measured value and a recorded

experience. While acoustic ecologist R. Murray Schafer has drawn attention to the denigrating effects of mechanical reproduction on the auditory environment, I argue that residents and state actors in Taiwan actually come to know noise through the tools of mechanical reproduction. In Taiwan's efforts to be a modern, rational state, the act of hearing noise becomes contingent upon technological mediation. I contribute to existing historical and ethnographic studies of noise by drawing attention to a locally-situated, technologically aspirational approach to noise.

Adam Wilson, "Improvising Music with Flawed Creative Software Agents"

When it comes to artificial agents performing human tasks – and despite disagreement around the precise nature of human intelligence – it is reasonable to state that AI systems, at present, do not exhibit human intelligence; they differ from explicitly programmed automated systems in that they employ learning models that allow artificial agents to infer the rules governing particular human behaviors. The "noble goal" of such artificial intelligence systems is to reproduce human activities without error. In the creative domain, this objective becomes problematic. While we may develop software agents that learn a particular musical style and generate novel music within the confines of that style, a well-designed agent will never deviate from the learned style, or produce innovation. AI techniques may still, however, be usefully deployed in the service of computational creativity: by intentionally incorporating flaws into an artificial agent to allow some degree of non-idiomatic deviation from a human-derived corpus, and by including a feedback mechanism for human ratification or dismissal of deviations, we may produce an agent that facilitates and extends human creativity. I intend to talk about the details of this kind of human-computer interaction as it pertains to my work in music improvisation.

Anna Xambo, "Live Repurposing of Crowd-sourced sounds: Challenges and opportunities of using online repositories in music performance"

There exist a number of online user-generated audio databases with field recordings, musical samples, sound effects, and musical pieces released under Creative Commons licenses (e.g., Freesound, Jamendo, cc-Mixer). The European funded-project Audio Commons (<http://www.audiocommons.org>) is looking into how Creative Commons content can be used by creative industries based on identifying user needs and developing suitable technologies.

In this talk, I will present the state-of-the-art of repurposing crowd-sourced sounds in music performance. Then, I will reflect on my own practice in musical live coding, a music improvisation practice that is based on generating code in real time, using SuperCollider, the online database of Freesound.org, and music information retrieval techniques in creative forms. The challenges of repurposing this material in live performance will be discussed, such as dealing with an heterogeneous sound palette consistently, making visible the performer's actions to the audience, collaborating with other musicians, and making sure to attribute correctly the work to the authors during performance and in future dissemination.

This work contributes to the Audio Commons project by promoting the use of open audio content and developing technologies that can inform an ecosystem of content repositories, production tools and users from a music performance perspective. The Audio Commons Initiative is funded by the European Commission through the Horizon 2020 programme, research and innovation grant 688382.

Andrew Watts, “What it means to be post human – An Exploration into Electronically Implanted, Augmented Voices”

Written in 2016 for Rage Thormbones (Weston Olencki and Matt Barbier), *A Dialogue, In Absentia* explores the means of shaping Bluetooth audio playback in real-time through utilizing the acoustics of the trombone. This work is a continuation of my research into the compositional applications of language fragmentation, focusing on the ability to convey meaning through the voice even when syntax is lost, fragmented, or otherwise unintelligible. The premise is two giants of existentialist philosophy, Søren Kierkegaard and Friedrich Nietzsche, are conjured to debate on the topic of solitude (embodied by the trombone duo). After a number of excerpts from each philosopher, Kierkegaard and Nietzsche, on solitude have been selected, the prose is processed through different text-to-speech synthesizers. In the score, this text will be treated with a fragmentation procedure using the International Phonetic Alphabet (IPA), initiating the transformation from “faceless” soloists into the purity of unattainable language. The goal is to strip the distance these intensely humanistic texts from natural expression, so that the duo can “hack” the playback and bring in added nuance and human expression.

What it means to be post human (in progress) for Ekemeles Vocal Ensemble takes the physical concept outlined in *A Dialogue, In Absentia* and re-imagines it in a futuristic, hive-mind scenario. The text-to-speech procedure used before now is virtuosically allocated to the different singers. Rather than a dialogue between two forces, a hoquet is the primary compositional structure, whereby the audio (this time played back into each singer’s mouth through a headset) is a singularity among the group. Together the two works seek to explore how technology can utilize the human body as an acoustical space, with live performers modifying the playback environment while philosophizing on the most profound tenets of humanism.

Jean Beers, “Does human to technology interaction shape the creative output and production of sound in a context of contemporary ‘art music’?”

Composers of contemporary classical music or ‘art music’ are faced with boundless freedom, countless obstacles or self-inflicted limitations. Can the inclusion of technology help composers to channel this scope of technical and creative possibilities, while offering new forms of affect?

Increasingly, the principal of distributed agency lies at the core of social change, where social media brings together various individuals with a common interest or goal. In classical music, collaborations amongst performers are common practice, while composing is mostly considered to be a task for solace. As, in DJ culture, the sound samples are partly self-created as well as alien-sourced, collaborative compositions and performances are not a rarity. Furthermore, the inherent techno-human interchange when creating sound samples for a set can be likened to an instrumentalists’ close relationship with their instrument, in which the previously inanimate object becomes alive with sonic vibrations through which the object-human encounter embodies music.

While the art of improvisation, from which Western classical music had seeded, has been side lined by the strive for introducing and fabricating new sounds as well as driving forth innovation in musical notation, improvisation is a central aspect of DJ culture. Can the lost art of improvisation in classical music be brought back to life through sharing creative agency with technology?

This paper examines three case studies of mine on techno-human encounters that aim to explore contemporary creative possibilities, while using performative embodiment to gain another affective force, encouraging freedom of expression through tolerance, knowledge and impetus gained from collaborative improvisation: 1. electronics manipulating natural sounds, 2. collaborative improvisation with acoustic and electronic sound sources, 3. collaborative composition using original modular techno style electronics, acoustic improvisation and processing.

Jaime Oliver La Rosa, “Pierre Schaeffer, the instrument builder”

Early Tape Music composers and theorists conceived of studio composition as a new medium that overcame the limitations of the physical world, both in terms of the material construction of musical instruments and the capabilities of human performers. Thus tape music is often defined by the absence of such instruments and performers. However, a closer look at the work of early theorists and composers such as Pierre Schaeffer, reveals that the concept of musical instrument is central to tape music composition.

Scholarship on Schaeffer usually focuses on the practice of reduced listening, the associated concepts of the acousmatic and the sound object, and the idea of sound in itself. However, these concepts are generally presented without reference to the compositional method that Schaeffer sketched in his *Treatise of Sound Objects*. It is in this context that reduced listening is proposed as a method used by the composer of acousmatic music to identify musical values that could lead to the identification of sound objects. The composer then forms collections of sound objects are then chosen, designed, and combined according to shared perceptual invariances that the listener interprets as coming from a single imaginary source which Schaeffer called a pseudo-instrument. Pseudo-instruments provided an opportunity to gain unity of musical material out of the diversity of sounds produced in the studio, thereby adapting the tape medium to the aesthetic ideas of instrumental music.

In this paper, I hope to present Schaeffer’s conceptual framework in the context of his composition practice as it was originally intended. I believe this will provide the fields of musicology and sound studies a better insight into Schaeffer’s musical thinking and provide composers and instrument builders with models that can inform the design of new instrumental behaviors better suited to the aesthetics of new media.

Joe Cantrell, “The Human Object: New Materialist Models to Resist Obsolescence in Technological Sound Practices”

In their choice of the tools of their craft, electronic musicians have a close, working relationship with a specific form of mass-produced commodity: technological audio devices. Like other manufactured goods, they originate from a global production system that is historically exploitative, environmentally unsustainable, and beholden to the expectations of continuous technological improvement and obsolescence. Electronic musicians must consistently adapt to and purchase new software and hardware to avoid losing critical functionality and compatibility. The digital musician’s participation in this process poses questions regarding the ethical defensibility of self-expressive acts relative to the net negative effects of their contribution to technological production methods that promote suffering and global destruction.

To counter these continuing tendencies, I offer a reading of new materialist theory with an eye toward how it may be specifically applied to electronic and digital musicians. New materialism projects a perception of the world in which the differentiation between humans, non-humans, and objects is called into question. This dissolution of boundaries is further extended to broader global systems of culture, capital and polity, connecting the very small to the very large. In this way, the ethical consequences of larger systems of influence become intrinsic to physical objects.

Applied to technological audio devices, porous boundaries allow a vision of audio technology that is inclusive of all the bodies with which it has come in contact, urging a limited sense of anthropomorphic identification with its users. By locating music technology within a larger personal continuum of bodies, objects, and capital, a means of rethinking the relationship between electronic performers and their material tools can be enacted. In doing so, devices that were once subject to the whims of constant development, become imbued with a personal sense of vitality, making them more difficult to be perceived as disposable and obsolete.

Frieda Abtan, “How to improvise with your past: an audio-visual journey”

In this talk I will discuss the three most common methods for real-time improvisation using previously recorded audio and video: sequencing, reprocessing, and accompaniment. All of these methods will be evaluated according to key criteria for ‘success’ including required virtuosity, robustness, and the dynamism of their results. They will also be discussed in terms of their potential for aesthetic complexity. Finally, I will discuss the question of liveness in electronic music and audio-visual performance.

Christopher Jette and Elliot Canfield-Dafilou, “Sound::Space—An Approach to Environment-Centric Field Recording”

The act of recording sound typically focuses the listener on the agents of sound production within a given space. A microphone captures the pluck of a guitar string, the guttural vocalization of an elephant seal, or the clap of thunder across Yosemite valley. These are all agents producing sound within a space, and not the space itself. This focus on the phenomena which generate sound prioritizes the body which creates the sound. In this talk we propose a new focal point—the space in which sounds occur. We aim to focus the attention of the listener on the agency of the space, not simply the sonic phenomena occupying the space. Impulse response measurement is used to characterize the properties of a system but is seldom employed outside traditional room acoustics applications. We explore how impulse response measurement can be incorporated into soundscape and field recording projects in order to study the character and evolution of these environments. We aim to explore the evolution of vanishing sonic spaces such as forest canopies and ice caves, as well as evolving urban environments and the seasonal changes in our own backyard.

This talk will discuss our development of a portable impulse response measurement system which is used to record high quality impulse responses in a variety of situations. Our apparatus leverages portable off-the-shelf recording gear. This flexible system can be used for projects integrating new strategies for collecting sonic data. By moving the conversation to focus on acoustical environmental data we lay the ground work for recording projects that archive a given space and explore its evolution. The implications for eco-acoustic research and the creation of material for creative applications follow from this appreciation of the agency of space.

Joel Rust, “Voice, after the anthropocene”

A barren rocky planet has been terraformed into a monocultural forest farm. Genetically identical trees were planted in a hexagonal grid on any cultivable land; a minimal ecosystem was constructed around them, to provide enough resources for their growth and a survivable atmosphere. A town was built where the human engineers and managers lived and worked. But the venture has failed. The trees aren’t growing right, and it isn’t clear why. The company has cut its losses and now there are only four humans who remain on the planet, wrapping up its operations. The last transport ship is now nine hours late.

As the humans carry on waiting, they become aware that the planet and its lifeforms, for so long a resource or a backdrop, a fake thing made for their use, is a more complex being than they had perceived; and they begin to hear its voice.

This is the plot of an opera I’m writing, entitled *The Conifers*, with poet David Troupes; the ‘planetvoice’ constitutes the work’s electronic part. Drawing on concepts of voice, agency and interconnectedness from anthropology, ethnomusicology, and sound studies, it is part theorization, part technical explanation, and part performance of this voice that has emerged from an anthropogenic climate catastrophe.

Brian Kane, “In search of audile technique”

In this keynote talk I will engage in a search for audile technique by examining (and thus, always, re-examining) the meaning and use of audile technique as critical term in sound studies. My method will be prismatic and paratactic. I will subject (the term or concept or practice or regime of) audile technique to a series of questions: discursive (about its coinage, use, and dissemination in sound studies), historical (about its modernity and its routes of transmission and replication across time and space), anthropological (about its culture and practice), political (about the subjection and resistance of listeners in their engagement with it), mereological (about the singularity of audile technique and the multiplicity of audile techniques), and ontological (about the very status of the term’s referent). In doing so I hope to encourage sound studies, in all of its breadth and heterogeneity of concerns, to linger on what still remains its most incorrigible and robust problem: the history and structure of listening.

BIOGRAPHIES

in alphabetical order

Freida Abtan is a Canadian audiovisual composer and multi-disciplinary artist with a keen interest in immersive media. She works between fixed and real-time computational technologies in sound and video for concert diffusion, installation, and large-scale multimedia performance situations. Her music ranges from acousmatic composition to more industrial and pop-influenced experimental performance. She has toured internationally both as a solo artist and as a floating member of the renowned experimental music group Nurse with Wound. Her compositions, performances, and installations have been featured at ICMC, the Spark Festival of Electronic Music, Mutek, The Elektra Festival, and Cap Sembrat. Currently, she leads the Music Computing program at Goldsmiths, University of London.

Jean Beers is a composer-pianist, an internationally sort after performer, having been featured at venues including Beethoven Haus Bonn, Konzerthaus Berlin, Mozarteum (Salzburger Festspiele), Philharmonie Luxembourg, Palau Musica Barcelona, Philharmony Kiev, Cité Université Paris and Southbank Centre London (State of the Nation Festival). Also active as a jury member for composition competitions and music researcher, Jean collaborates in interdisciplinary art projects, including work with EDM DJs, experimental new music specialists and classically trained virtuosos. Her doctoral research explored musical ambiguity through deconstructive composition methodologies, beside her longterm practice-based research The Threefold Challenge – Performer, Composer, Audience.

Zeynep Bulut is a Lecturer in Music at Queen’s University Belfast. Prior to joining Queen’s, she was an Early Career Lecturer in Music at King’s College London (2013-2017), and Research Fellow at the ICI Berlin Institute for Cultural Inquiry (2011-2013). She received her Ph.D. in Critical Studies/Experimental Practices in Music from the University of California at San Diego (2011). Situated in the fields of experimental music, voice and sound studies, her research and forthcoming book, *Building a Voice: Sound, Surface, Skin*, theorizes the emergence, embodiment and mediation of voice as skin. Her articles have appeared in various volumes and journals including Perspectives of New Music, Postmodern Culture, and Music and Politics. Alongside her scholarly work, she has also exhibited sound works, and composed and performed vocal pieces for concert, video and theatre. Bulut is sound review editor for Sound Studies: An Interdisciplinary Journal.

Elliot K. Canfield-Dafilou is a PhD candidate at the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University where he is a sound engineer, composer, and researcher. Elliot holds degrees in music theory and music technology from Penn State University as well as a degree in music, science, and technology from CCRMA. While at Penn State, he wrote his master's thesis on spatialization in the music of Iannis Xenakis. He is fascinated by strange and interesting sounds and dabbles in all forms of audio. More info can be found at kermit.audio.

Joe Cantrell is a musician and multi-media artist specializing in sound art, installations, compositions, and performances inspired by the implications of technological objects and practices. His work examines the incessant acceleration of technological production, its ownership, and the waste it produces. Joe holds a BFA in music technology from CalArts, an MFA in digital arts and new media from UC Santa Cruz, and a PhD in music at UC San Diego. His work has been honored with grants from the Creative Capital Foundation, New Music USA, and the Qualcomm Institute Initiative for Digital Exploration of Arts and Sciences, among others.

Iris Garrelfs is a site-responsive sound artist active across performance, installation and fixed media. Through listening she explores relationships with the world; her understanding of place includes people who, through their ideas or presence, participate in creating it. Work establishes experiences, environments for listening and has been shown worldwide, including Tate Britain, Visiones Sonoras Mexico, Palazzo delle Esposizioni Rome, Onassis Cultural Centre Athens, ICMC New York, FRUITYSPACE Beijing. Garrelfs is the commissioning editor of the online journal Reflections on Process in Sound and Lecturer in Sonic Arts at Goldsmiths, University of London.

Jennifer Hsieh is a Junior Vossius Fellow at the University of Amsterdam, where she is investigating urban noise in the context of science, public health, and sensory perception. She completed her PhD in anthropology at Stanford University with the dissertation, "Noise Governance and the Hearing Subject in Urban Taiwan" and is currently working on a book manuscript. Her work has been funded by the Social Science Research Council and Wenner-Gren Foundation, and she has had fellowships and affiliations at Max Planck Institute for the History of Science, Stanford Humanities Center, and Academia Sinica Institute of Ethnology.

Christopher Jette is a curator of lovely sounds, creating work as a composer and new media artist. His creative output are sonic portraits of places, sounds and performers at the intersection of data information and aesthetic intuition. Christopher's research details these technical and aesthetic investigations and explores technology as a physical manifestation of formalized human constructs. A highly collaborative artist, Jette has created works that involve dance, theater, film, websites, electronics, food, toys, typewriters, cell phones, instrument design and good ol' fashioned wood and steel instruments. In addition to creating concert music, Christopher explores Creative Placemaking through site-specific and interactive work as a core-four member of the Anchorage based Light Brigade. At UC Santa Barbara Clarence Barlow and Curtis Roads made lots of suggestions about his PhD dissertation and at New England Conservatory, Robert Cogan asked many insightful questions about his music. In 2015-16 Jette was the Interdisciplinary Grant Wood Fellow and is currently is a Technical Staff at CCRMA where he directs the Max Lab. Learn more at www.cj.lovelyweather.com

Brian Kane is Associate Professor in the Department of Music and affiliated faculty with Film and Media Studies at Yale University. He was a Mellon Postdoctoral Fellow in Music at Columbia University before joining the faculty at Yale. Kane's research explores the intertwining of traditional music disciplines (such as music theory and musicology) with sound studies, philosophy, media studies, and contemporary sonic practices. He is the author of *Sound Unseen: Acousmatic Sound in Theory and Practice* (Oxford University Press, 2014). The book, which begins with a close reading of Pierre Schaeffer's theory of the acousmatic reduction and the sound object, posits an alternative theory of acousmatic sound by exploring its interdisciplinary manifestations in domains as broad as

literature, philosophy, film, staging, and popular music. He is currently working *Hearing Double: Jazz, Ontology, Auditory Culture* (forthcoming with Oxford University Press), which explores the ontology of jazz by investigating its core repertory, practices of replication, modes of distribution and circulation, and cultural history.

His articles have appeared in *The Journal of the American Musicological Society*, *Music Theory Spectrum*, *Organised Sound*, *New German Critique*, *20th Century Music*, *Contemporary Music Review*, *Polygraph*, *Journal of Visual Culture*, and *Qui Parle*. Kane is also a founding editor of *nonsite.org*, an online, open source journal of the arts and humanities.

Jaime Oliver La Rosa (Lima, 1979) is a computer music composer, performer, and researcher working at the intersection between musical instruments and open works. He is also Assistant Professor of Composition at NYU, obtained a PhD in Computer Music from the University of California, San Diego and was Mellon Post-Doctoral Fellow at Columbia University & the CMC in New York. His open source *Silent Drum* and *MANO* controllers use computer vision techniques to continuously track and classify hand gestures. He also develops a computer assisted notation software for *Pure Data* and *LilyPond* called [notes] and composes works using the sounds of Pre-Columbian musical instruments called “silbadores”. Some recognitions include scholarships and grants from the Fulbright Commission and the Mellon Foundation, composition and research residencies at ZKM and IRCAM, and prizes from FILE Prix Lux, a Giga-Hertz-Preis, and the Guthman Competition of Musical Instruments.

Conor McCafferty is carrying out PhD research on urban sound mapping. His research draws on his experience in both sonic arts and architecture. He holds a BSc in Music Technology from Queen’s and has several years experience on projects relating to architecture, urbanism and placemaking. His research develops interests in participatory urbanism, urban sound and urban pedagogy. Conor works variously as a composer, researcher, writer and documentary producer. He is co-producer of *The Infinite City*, a new podcast about urban history and urban experience.

Joel Rust writes music that encompasses kaleidoscopic textures, disintegrating mechanical systems, and a rich harmonic language that draws on spectralism, jazz, and the English pastoral school. He is a PhD student at New York University, where he studies composition with Louis Karchin, Jaime Oliver, and Elizabeth Hoffman. His scholarly focus is sound and the city in the early twentieth century. Currently, he is developing an opera, *The Conifers*, with poet David Troupes, supported by a Jerwood Opera Writing Fellowship at Aldeburgh Music.

Andrew Watts’ works, from chamber and symphonic to multimedia and electro-acoustic, are actively performed throughout the US and Europe. His compositions have been premiered at world-renowned venues and he has written for many of the world’s top contemporary ensembles. In 2017-2018 he will be writing for Ekmeles and Proton Bern. He is a doctoral candidate at Stanford University studying with Brian Ferneyhough and working towards a D.M.A. in Composition. His music has been featured at Delian Academy, Young Composers Meeting, Cheltenham, Darmstadt, Composit, Ostrava Days, highSCORE, Wellesley Composers Conference, Etchings, Fresh Inc., New Music on the Point, and AMF.

Kurt James Werner has been a Lecturer in Audio at the Sonic Arts Research Centre (SARC) of Queen’s University Belfast since early 2017. His research sits at the intersection of Virtual Analog (especially theoretical aspects of Wave Digital Filters), computer modeling of circuit-bent instruments, and the history of music technology. As part of his Ph.D. in Computer-Based Music Theory and Acoustics from Stanford University’s Center for Computer Research in Music and Acoustics (CCRMA), he wrote a doctoral dissertation “Virtual Analog Modeling of Audio Circuitry Using Wave Digital Filters.” This greatly expanded the class of circuits that can be modeled using the Wave

Digital Filter approach to include circuits with complicated topologies and multiple nonlinear elements. As a composer, his music references elements of chiptunes, musique concrète, circuit bending, algorithmic/generative composition, and breakbeat.

Adam James Wilson is a composer, guitarist, and software developer who programs computers to improvise with human musicians. His work incorporates music information retrieval, algorithmic composition, and data sonification. He performs with his software experiments on the fretless electric guitar, an instrument that caters to his penchant for microtonality. Wilson is director of the New York City Electroacoustic Improvisation Summit, an annual concert series featuring musicians focused on the integration of music improvisation and real-time interactive computer systems. He is an Assistant Professor of Emerging Media Technology, specializing in Music Technology and Media Computation, at City University of New York.

Anna Xambó Ph.D. is an experimental electronic music producer and researcher with a focus in computer music, live coding, collaborative and participatory interfaces for music, real-time music information retrieval, creative coding and computer science education through music. She is currently a postdoc at the Centre for Digital Music, Queen Mary University of London, working on the design and evaluation of new tools for music production and performance within the EU-funded project Audio Commons. <http://annaxambo.me> <http://www.audiocommons.org>