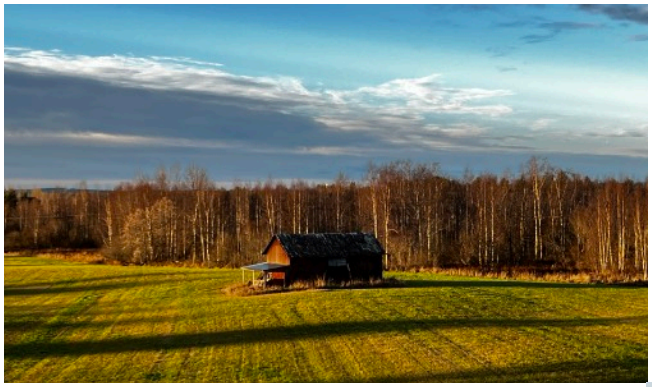
# Jazz in the Expanded Field

*—telematic music systems for transdisciplinary improvisation and performance ecology*



PhD Proposal in Music
KMH, Stockholm

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*...or: a proposal to turn the field behind my house into a music instrument.*

## Research Questions

*Take a deep breath.*

*Imagine a large, square field of grass.*

*Music floats in the air, blending with the sounds of nature.*
*As you walk across the field, the timbre changes gradually.*
*It starts soft, then becomes increasingly piercing as you approach the far end of the field.*

*Imagine that the field of grass is the morph pad on a digital synthesizer.*
*A touch interface whose axes map to qualities in the instrument's sonority.*

💡 **If a landscape can be turned into a complex input device, controlling multiple parameters in a stochastic music-generating algorithm, how do we define its poetics?**
What is performance technique, when musical expression is location-based rather than gestural?
How does the geometric/geographic scale relate to the temporal dimension of music?
Can we spend a lifetime inside this music environment?

💡 **If the environment is a music instrument, what are the ethics of performance?**
Do we try to *master* performance, by *mastering* the environment—or do we choose a path of ecology, reintegrating our activity with the more-than-human world? Can we use musical landscapes to promote music making in everyday life, and rehabilitate the role of musicianship, as a contribution towards reorienting our culture for sustainability?

## Telematic Music Systems

I want to use nature as a musical instrument, write for and perform with it. My proposal entangles music, ecology and technology, in the spirit of Pauline Oliveros, David Tudor, and Bernie Krause. I make *musical systems*, in composer Harry Partch's sense—a union of material, instrument making, composition and performance (cf. Partch 1974). My systems are *digital*, *algorithmic* and *networked*—part of the *NIME*[1] field—crafted through *digital lutherie* (cf. Jorda 2005).

In NIME, any electronic device, interface, or data-stream can become musical input. My systems are controlled by the phone in my pocket as I move through the field. Performance is a *telematic* (cf. Ascott 1990) interplay with a technical framework involving GPS signals, Internet infrastructure, and a generative music process, running in the cloud and streaming audio to the performer's device.[2]

In my daily work as a software developer, I create and configure resilient and scalable systems using *cloud technologies*. The cloud is built on *containerized* software, a standard developed to meet extreme demands of availability in digital services. Containers have revolutionized

[1] New Interfaces for Musical Expression, see nime.org.
[2] Lemmon (2019) argues for the *cybernetic* nature of telematics as distinct from other technological music making.

software development, like shipping containers revolutionized logistics.[3] But while digital tools have proliferated in creative practices—not least music making (cf. Magnusson 2019), the underlying infrastructures remain under-examined, both as tools to build robust digital artworks, and as artistic metaphors.

My proposal contributes to digital lutherie by adopting the cloud paradigm for algorithmic composition and performance. It does so in an ecologically sensitive way, installing no technology in nature, emitting no sound beyond the performer's movements.[4] The on-demand music server's energy use is minimal, and can be measured and offset.[5]

Digital infrastructure has shaped my lifestyle, working online while living in a village close to nature. Too often, technological innovation makes musicianship more precarious and less sustainable. My research aims to demonstrate ecological uses for technology in music making.

## Transdisciplinary Improvisation

Since graduating KMH's Master Program in Jazz, my music has evolved to become more exploratory. I have picked up new instruments, and played things that are not music instruments—materials, like glass and clay, and environments. I have decided to make music with whoever wants to, not just with other professional musicians. And I have adopted generative music software—mainly SuperCollider—for algorithmic composition and performance.

Algorithmic composition unfolds as a network of musical possibilities, a *rhizomatic structure* beyond linear or cyclical form. Performing it is one level abstracted from mechanical execution. Instead of individual notes, the evolving character of the piece is played, as conductors "play" an orchestra. Thoughtful interaction design can use this abstraction to invite non-musician practitioners into improvisation, by repurposing their familiar tools as music instruments.

In projects during the last decade, I have made music with craftspeople, sculptors, designers, and visual artists. During my research project *Sounding Craft* at Konstfack I formulated a methodology for these collaborations, based on *transdisciplinarity*. (cf. Nicolescu 2002)

Transdisciplinarity goes beyond using methods from different fields—it fuses them into a shared framework. In Nicolescu's argument, the rupture in classical physics caused by the unveiling of the quantum world, forces us to acknowledge a multi-layered reality, evident to pre-modern societies, but shoved aside by positivist thinking.

In *Sounding Craft*, I used the heritage of *work songs* to argue for reintegrating music and crafts practices. This proposal deepens my commitment to transdisciplinary improvisation by extending the invitation to perform music, not as a dimension of practice, but as a dimension of everyday life. The music systems I install in nature are meant to be left there for people to discover. Anyone with a phone and a pair of headphones will be able to initiate the music system, and start improvising with music composed for that specific site.

[3] See Buyya et al. (2011) and Hightower et al (2017) for foundational and applied perspectives on cloud computing.
[4] To address environmental sound pollution, performer and audience wear headphones. (cf. Shannon et al. 2016)
[5] A virtual server is created on-demand in the cloud. The use of computation resources can be translated to energy.

## Performance Ecology

Ecology is the study of relationships within systems. Sustainability is the normative application of ecology, aiming to maintain those systems in the face of disruption. A goal of my research is the synthesis of different ecologies—musical, technical, social, environmental—into a sustainable form of musicianship adapted to the challenges of our times.

During my music career, the industry has been disrupted repeatedly by developments in digital technology. I have found it exhausting trying to adapt my practice to trends in digital markets that keep changing. It is not an exaggeration to say that musicianship is in an ecological crisis, and has been for a long time.

In *Art and Sustainability*, Sacha Kagan develops a powerful argument for the critical role art must play in our transition to environmental sustainability. He identifies the roots of the current climate crisis in a *culture of unsustainability* in Western thought, culminating in scientific positivism and its siloed, fragmented modes of knowledge.

In *Sounding Craft*, I used Schafer's *acoustic ecology* to explore how industrialization broke the bonds between making and music, forcing both out of the everyday and into bounded contexts on the peripheries of social life. Kagan reminds us that we have a responsibility as artists to break out of these boxes, and seek reintegration with the rest of society.

My *performance ecology* is embodied musicianship resisting obscurity by engaging head-on with digital technology, environmental and social issues. Embedded in rural community and post-industrial landscape, it creates sited music objects inextricably tied to their environment, and invites everyone to experience the depth, joy, and presence of making improvised music.

## Methodology

My research contains four interlinked components—material, instrument, composition, and performance. **Material** is gathered in nature. *Participatory field recording* blends *documentation* and *performance*. Recordings are processed through *curation*, *restoration* and *archiving*.

**Instrument design** uses *mapping strategies* (cf. Miranda & Wanderley 2006) and *prototyping*. Various methods and concepts from software design are used, like *agile development, microservices*, *auto-scaling*, *API design* and *API integration*.

**Composition** uses *affordance mapping* (cf. Gibson) to encode emergent musical behaviors, and *reflective live coding* to balance feedback loops. Software methods like i*terative development* with *version control*, and *minimum viable product* contribute to a shift in the ontology of the musical *work* from a fixed to a living entity (cf. Goehr 1992).

**Performance** uses embodied practices like *walking and dancing,* informed by *deep listening* (cf. Oliveros 1984).[6] *Performative autoethnography* to document enactment of progressively complex *performance scores* (cf. Halprin 1995) based on scenarios listed below. *Reflective writing*, *field notes*, and *collaborative accounts* to create a vocabulary for ecological music performance. *Audio, video and metadata recordings of the performances are the project's main artistic outcome.*

These ***scenarios*** will use diverse NIMEs and compositions, generating recursive variation:

[6] The ecological walking-based land art of Richard Long has been a decisive inspiration for this project.

1. One performer, moving freely in a field. Music generation is based on GPS data.
2. Like 1, but multiple performers with distinct musical roles—harmony, rhythm, melody etc.
3. Like 1 and 2, but using other sensor input—like gyroscope—for gestural performance.
4. Like 1 and 2, but integrating external data-streams, like weather, pollen levels, or air-quality.
5. Geographic-scale composition. Map layers—terrain type, topography—guide performance.
6. Social-scale composition. Passive participation, using wifi and bluetooth signals as inputs.[7]

## Research Plan[8]

I look forward to taking part in institutional work at KMH through teaching, organizing, or peer review, and contributing to artistic music research. I hope to collaborate across institutions, and participate in inter/transdisciplinary contexts. I strongly prefer Open Access publishing, especially journals following the Diamond standard, (c.f. Bosman et al. 2021) such as Network Music and Arts, Journal of Sonic Studies, the Journal for Artistic Research and others.

**Y1**: Create a simplistic music system, perform and document **scenarios 1, 3 and 4**. First paper based on conceptual and technical groundwork. Apply to conferences for Y2. Investigate interest from institutional partners. Create comprehensive music material for later use.

**Y2**: Refined and scaled-up technical solution. Article on participatory field-recording. Conference contribution with live-coded performance. Apply for travel/project grants for Y3, including to permanently install music systems in specific locations.

**Y3**: Permanent installation of music system, assessment of community impact. Refine generative composition, enact **scenarios 2 and 5**. Paper on scales of geographic improvisation. Conference talk including audience performance. Seek collaboration, and apply for grants to conduct scenario 6 (social) in a specified location.

**Y4**: Enact **scenario 6**. Structure and write dissertation, prepare for defense and book publication. Organize a festival in my field, with other composers and performers using my music system. Opening it up to collaboration would be an artistic highlight of the project for me.

## Conclusion: Jazz in the Expanded Field

The title of this proposal paraphrases a foundational text in postmodern art theory. Rosalind Krauss' inclusive redefinition of sculpture helped establish a relational aesthetics, used to legitimize conceptual, performative, and site-specific forms of expression, including in *eco-art*.

In *Sounding Craft*, I positioned transdisciplinary music practice relative to jazz tradition, and explained the fracturing of music and making in the modern world as an ecological crisis. This proposal continues my research by applying Krauss' frame to jazz—not to dislocate it from its historical and social roots, but to reintegrate its core improvisational ethos into everyday life.

The *actual field*—my view through the window as I write—also expands. By encoding music into its geography, this unassuming place—where my neighbors walk their dogs and carry fishing rods to the lake—becomes a site for spontaneous musical expression, cultivating ecological dialogue with the biotope and a personal sense of stewardship for the environment.

[7] Distinct ethical considerations in this scenario fall outside the scope of this text but will shape the research process.
[8] I don't foresee significant technical or ethical risks in the research plan, but welcome discussions with the jury.

# Bibliography


Abram, David. 1996. *The Spell of the Sensuous: Perception and Language in a More-than-human World.* New York, NY: Vintage Books.

Ascott, Roy. 1990. "Is There Love in the Telematic Embrace?" In *Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness*, edited by Edward A. Shanken, 232–246. Berkeley: University of California Press.

Beaver, Paul, and Bernie Krause. 1970. *In a Wild Sanctuary*. Warner Bros. Records.

Berque, Augustin. 2013. *Thinking through Landscape*. Abingdon, UK: Routledge.

Bosman, Jeroen, Bianca Kramer, Pierre Mounier, Vanessa Proudman, and Niels Stern. 2021. *The OA Diamond Journals Study. Part 1: Findings.* https://doi.org/10.5281/zenodo.4558704.

Buyya, Rajkumar, James Broberg, and Andrzej Goscinski, eds. 2011. *Cloud Computing: Principles and Paradigms*. Hoboken, NJ: Wiley.

Deleuze, Gilles, and Félix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia.* Translated by Brian Massumi. Minneapolis: University of Minnesota Press, 1987.

Eno, Brian. *Generative Music 1.* SSEYO/Opal Ltd., 1996. Floppy disk album with SSEYO Koan software. See also the 2024 restoration by Soft Automation, YouTube.

Fieldsteel, Eli. 2024. SuperCollider for the Creative Musician: A Practical Guide. New York, NY: Oxford University Press.

Gibson, James J. 2015. *The Ecological Approach to Visual Perception*. Classic ed. New York, NY: Psychology Press.

Goehr, Lydia. 1992. *The Imaginary Museum of Musical Works: An Essay in the Philosophy of Music*. Oxford, UK: Clarendon Press.

Halprin, Anna. 1995. *Moving Toward Life: Five Decades of Transformational Dance*. Hanover, NH: Wesleyan University Press.

Hannula, Mika. 2008 "Catch me if you can - Chances and challenges of artistic research ". In *ArtMonitor*, 4/2008, 109-29.

Hightower, Kelsey, Brendan Burns, and Joe Beda. 2017. *Kubernetes: Up and Running*. Sebastopol, CA: O'Reilly Media.

Jensenius, Alexander Refsum, and Michael J. Lyons, eds. 2017. *A NIME Reader: Fifteen Years of New Interfaces for Musical Expression.* Springer. https://doi.org/10.1007/978-3-319-47214-0.

Jordà, Sergi. 2005. *Digital Lutherie: Crafting Musical Computers for New Musics' Performance and Improvisation.* PhD diss., Universitat Pompeu Fabra. http://mtg.upf.edu/files/publications/PhD2005-sjorda.pdf.

Kagan, Sacha. 2013. *Art and Sustainability: Connecting Patterns for a Culture of Complexity*. Bielefeld, Germany: Transcript Verlag.

Krause, Bernie. 1998. *Into a Wild Sanctuary: A Life in Music and Natural Sound.* Berkeley: Heyday Books.

Krauss, Rosalind. 1983. "Sculpture in the Expanded Field." In *The Anti-Aesthetic: Essays on Postmodern Culture*, edited by Hal Foster, 31–42. Seattle: Bay Press.

Kwon, Miwon. 2002. *One Place after Another: Site-Specific Art and Locational Identity*. Cambridge, MA: MIT Press.

LaBelle, Brandon. 2006. *Background Noise: Perspectives on Sound Art*. New York, NY: Continuum.

Lemmon, Eric C. 2019. "Telematic Music vs. Networked Music: Distinguishing Between Cybernetic Aspirations and Technological Music-Making." *Journal of Network Music and Arts* 1 (1). https://commons.library.stonybrook.edu/jonma/vol1/iss1/2/

Magnusson, Thor. 2019. *Sonic Writing: Technologies of Material, Symbolic and Signal Inscriptions*. New York, NY: Bloomsbury Academic.

Miranda, Eduardo Reck and Wanderley, Marcelo M. 2006. *New Digital Musical Instruments: Control And Interaction Beyond the Keyboard*. Middleton, Wisconsin: A-R Editions.

Nakai, You. 2021. *Reminded by the Instruments: David Tudors Music*. New York, NY: Oxford University Press.

Nicolescu, Basarab. 2002. *Manifesto of Transdisciplinarity*. Albany, NY: State University of New York Press.

NIME. n.d. New Interfaces for Musical Expression. https://nime.org.

Oliveros, Pauline. 1984. "Software for People." In *Software for People: Collected Writings 1963–80*, 177–190. Baltimore: Printed Editions.

Oliveros, Pauline. 1987. Echoes from the Moon. 1987. Telematic performance work using radio-wave moon bounce.

Partch, Harry. 1974. *Genesis of a Music*. 2nd edition. New York, NY: Da Capo Press.

Pearson, Mike. *Site-Specific Performance*. Palgrave Macmillan, 2010.

Roelstraete, Dieter. 2010. *Richard Long: A Line Made by Walking*. London, UK: Afterall Books.

Schafer, R. Murray. 1994. *The Soundscape: Our Sonic Environment and the Tuning of the World*. Rochester, VT: Destiny Books.

Shannon, G., M. F. McKenna, L. M. Angeloni, K. R. Crooks, K. M. Fristrup, E. Brown, K. A. Warner, et al. 2016. "A Synthesis of Two Decades of Research Documenting the Effects of Noise on Wildlife." *Biological Reviews* 91 (4): 982–1005. https://doi.org/10.1111/brv.12207.

Small, Christopher. 1998. *Musicking: The Meanings of Performing and Listening*. Middletown, CT: Wesleyan University Press.

Stiegler, Bernard. *Technics and Time, 1: The Fault of Epimetheus*. Translated by Richard Beardsworth and George Collins. Stanford: Stanford University Press, 1998.

Soft Automation. 2024. *Brian Eno: Generative Music 1 (1996. Generated 2024/11/12)*. Video recording, 2:05:17. Posted November 12, 2024. Accessed April 18, 2025, YouYube. https://www.youtube.com/watch?v=XbdG2HRKA1c

Tourtelot, Madeline, dir. 1969. *Delusion of the Fury: A Ritual of Dream and Delusion*. Video recording. Music by Harry Partch. Conducted by Danlee Mitchell. Performed by musician assembly led by Emil Richards. Recorded at UCLA Playhouse. Accessed April 13, 2025, YouTube, https://www.youtube.com/watch?v=aMQ7oeIvhkA

Tudor, David. *Rainforest IV* (1968–73). Sound installation and performance work.

Vallor, Shannon. *The AI Mirror: How to Reclaim Our Humanity in an Age of Machine Thinking*. Oxford University Press, 2024.