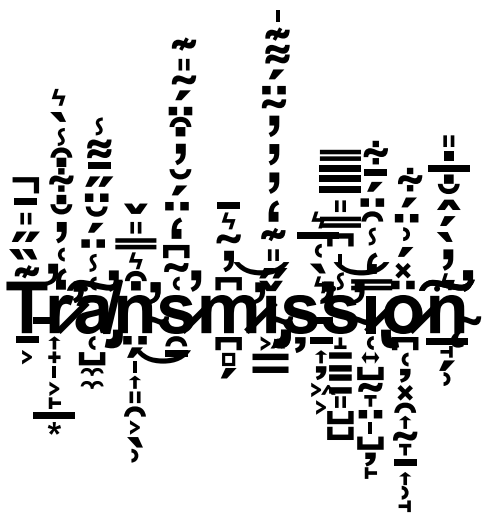
Transmission



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ABSTRACT:

This installation explores the theories of Carl Jung, investigating the nature of thought as a shared, interconnected experience rather than an isolated, individual process. Jung's theories of the collective unconscious provide a foundational framework of understanding thought as a shared, historical, interconnected process rather than as isolated, individual, or immediate.[1] The work *Transmission* investigates how ideas, emotions, and reflections emerge within a larger web of human consciousness, dissolving boundaries between the personal and the collective creating an immersive, live, evolving participatory sound work. Ultimately, this work proposes that our sense of self is not singular but a collection of millions, reflections of reflections, merging within an invisible current of shared memory and thought.

INTRODUCTION:

For centuries, thought has been perceived as an individual, internal act. Yet recent developments in neuroscience, artificial intelligence, and social theory suggest that cognition arises from a collective network of a shared, cultural experience.[2] *Transmission* challenges the traditional view by positioning thought and memory as participatory, historical, and fluid.

Anchored by an interactive typewriter, the installation collects participant reflections, which are transformed into an evolving soundscape through artificial intelligence (AI) and a computer algorithm I developed, The Ashari, which I explain later in this paper. This process draws on frameworks from participatory art, sound installation, and cognitive theory, positioning memory as something performative and dynamic, which is continuously reshaped through participant interaction. By immersing participants in this unfolding system, the work highlights

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[1] Yetwin, Neil B. "Thoreau, Jung, and the Collective Unconscious." *The Thoreau Society Bulletin*, no. 265 (2009): 4–7. http://www.jstor.org/stable/23402909.
[2] Andy Clark, *Supersizing the Mind: Embodiment, Action, and Cognitive Extension* (Oxford: Oxford University Press, 2008); Edwin Hutchins, *Cognition in the Wild* (Cambridge, MA: MIT Press, 1995); Wolf Singer et al.

how personal contributions ripple into a broader, collective reservoir of human experience, dissolving the boundary between self and other.

By integrating AI-driven composition with participant interaction, the software dissolves the boundaries between creator and audience. This aligns with Mark Dawes' discussion in *Performance Art: Spectacle of the Body*,[3] where he explores how performance art transforms the body into both a medium and a site of critical engagement. Just as performance artists challenge societal norms through embodied action, this installation enacts an evolving exchange between participant and computer.

THESIS STATEMENT:

Transmission challenges the perception of memory as an individual possession, revealing it instead as part of an invisible, ever-expanding archive of collective human thought proposing that our reflections do not exist in isolation—that they are continuously shaped, influenced, and reshaped by the unseen memories and thoughts of others thus forming a web of consciousness that transcends time and space. By converting personal recollections into sound, something intangible and fleeting just as the mind and memory, the work makes tangible the hidden forces that bind us, demonstrating that even our most private thoughts are echoes of a greater, shared human experience.

TECHNICAL AND ARTISTIC ARCHITECTURE OF TRANSMISSION:

The *Transmission* project bridges artistic expression and computational systems. I built a hybrid ecosystem that combines artificial intelligence, software development, and live performance. At its core, the system uses human input—typed words—which are transformed into evolving sonic, visual, and cultural experiences. This section provides an overview of the

[3] Dawes, Mark. “Performance Art: Spectacle of the Body.” *Circa*, no. 74 (1995): 26–29. https://doi.org/10.2307/25562887.

technical and artistic architecture of *Transmission*, explaining how all its components work together.

1 - The Typewriter

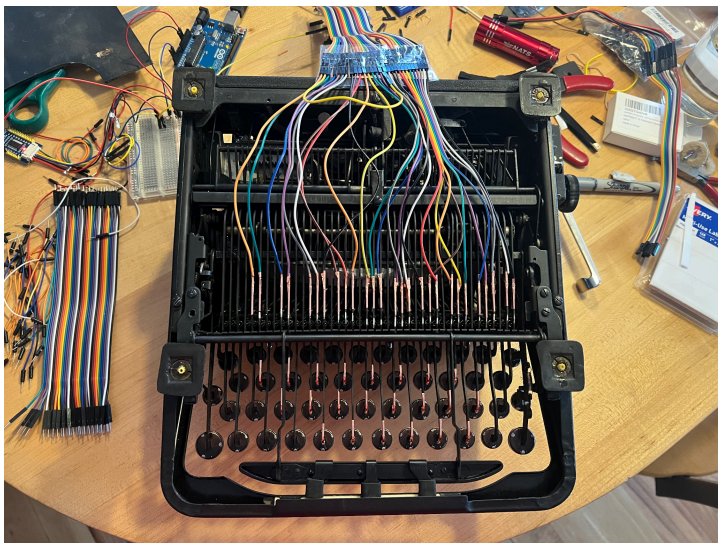


Figure 1. Vintage typewriter used in Transmission, retrofitted with Arduino and custom wiring. Photograph by author, 2025.

A vintage typewriter is retrofitted with an Arduino microcontroller, with each key (A–Z) wired to a breadboard and interpreted as input signals. When a performer types, the Arduino sends this data to the Python backend, activating The Ashari algorithm.

Performers work from prompt cards bearing intimate questions inviting deep reflection on loss, memory, survival, and identity—themes central to The Ashari's fictional cultural narrative. The prompt cards encourage performers to contribute emotionally charged and meaningful input, which amplifies the human-machine dialogue and shapes the evolving cultural memory in an authentic way—such as "What do you carry that no longer has a name?", "What memory returns to you uninvited?", "What do you whisper to the dead?", "What is the difference between endurance and numbness?", and "How do you define truth in a world shaped by lies?" This interaction blurs the boundaries between author and audience, transforming the installation into a living system of thought transmission and reinterpretation.

2 - The Ashari (Python Backend)

Code Repository: *https://github.com/casspangell/freesound-api-project.git*

At the heart of the system is the Python backend, known as The Ashari. This module functions as the cultural and emotional brain, using a two-step processing system to model collective consciousness. The Ashari's cultural memory filters and reshapes meaning based on past interactions, emotional context, and sentiment evolution. This custom-built AI system dynamically adjusts sentiment scores, generating responses that reflect shifting historical memory and emotional adaptation.

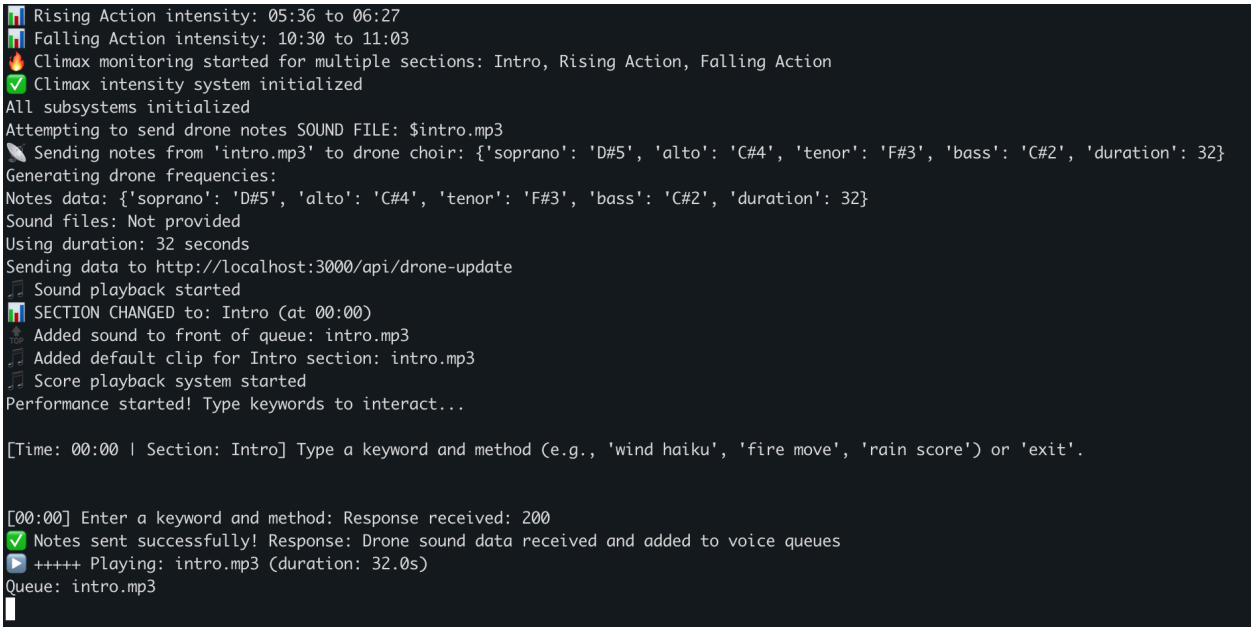


Figure 2. Screenshot of The Ashari software code running.
Screenshot by author, 2025.

The algorithm operates by assigning sentiment values computed using Ollama AI, gradually shaping The Ashari's "emotional state"/computational algorithm over time. The system relies on this analysis and tracking to retain contextual memory, identify recurring themes, and mirror the nonlinearity of human cultural cognition.

For example, repeated exposure to negative concepts like 'betrayal' will shift The Ashari toward guarded, mistrustful responses, as well as in the music, while the introduction of words like 'hope' or 'forgiveness' can gradually open the system to more optimistic interpretations. The algorithm tracks interaction history and evaluates whether certain words have caused significant

Sentiment Score Range & Meaning

Sentiment Score	Interpretation
-1.0 to -0.5	Deeply cynical, mistrustful, warlike, or survivalist.
-0.5 to -0.2	Wary but adaptable, skeptical of kindness but not dismissive.
-0.2 to 0.2	Neutral, pragmatic, open to change.
0.2 to 0.5	Cautiously optimistic, willing to trust.
0.5 to 1.0	Fully embracing positive ideals (peace, unity, love).

How the Sentiment Score Changes

When a new word is input:

1. The system **checks** the sentiment weight of the word (e.g., *love = -0.6, war = -0.8*).
2. The score is **adjusted** based on the word's effect and frequency.
3. If many **negative** words are received, the score **decreases** further.
4. If many **positive** words are received, the score **gradually increases**.

Figure 3. Sentiment value chart showing how participant inputs shape the evolving emotional state in Transmission. Diagram by author, 2025.

cultural shifts over time. It uses a recursive feedback loop, meaning prior emotional states influence how new inputs are interpreted, ensuring The Ashari's cultural memory evolves in a nonlinear, layered manner that reflects real-world processes of cultural change.

3 - Ollama AI as Co-Creator

Ollama AI is an open-source large language model (LLM) platform used in this project not only to calculate sentiment values, but to also assist in selecting the next audio soundscape and chord to play. The analysis is based on the emotional and cultural context of each typed word. Running offline on the local machine, Ollama AI provides efficient, real-time LLM analysis without relying on cloud services, preserving both privacy and artistic control.

Ollama AI is an active collaborator, shaping the evolving tone, mood, and expression of the piece. By interpreting emotional cues from participants' input, Ollama AI helps steer the performance in unpredictable and emergent directions, blurring the line between human and machine agency.

4 - DroneChoir Web App

Code Repository: *https://github.com/casspangell/drone-choir-app.git*

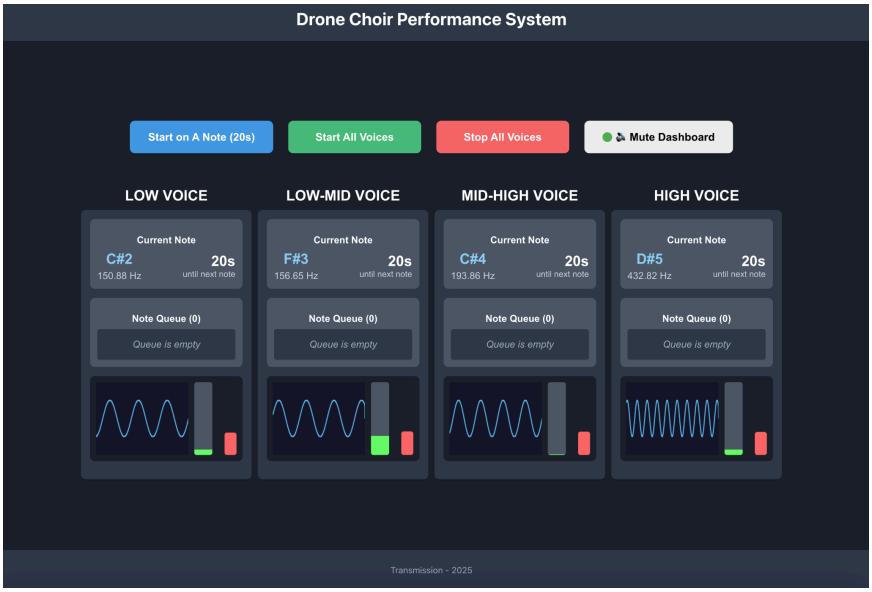


Figure 4. DroneChoir main dashboard module interface, showing real-time voice module control for Transmission performance. Screenshot by author, 2025.

Complementing The Ashari is the React.js web application, which functions as the distributed voice choir. This system manages a network of voice modules—low, low-mid, mid-high, and high voices—each running in a React.js environment.

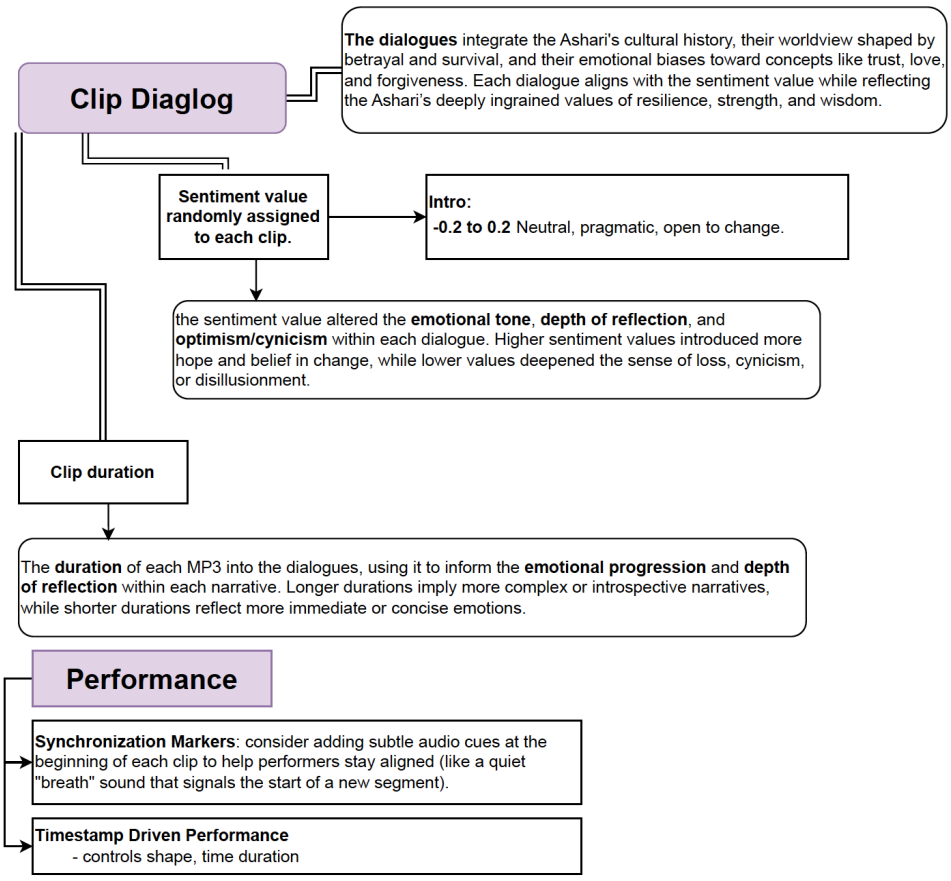
The installation operates on a local wireless network, with each performer connecting their smartphone to the local network and accessing one of the four voice modules by scanning a QR code linked to the module's URL. When the Python script initiates the performance, note frequencies are sent in real time to each voice module using a REST api. Performers hear these tones through their earbuds and sing the frequencies they receive, becoming active sonic contributors to the unfolding soundscape above.

Figure 5. Performer's view of individual voice module on smartphone during Transmission, showing real-time AI-generated prompts. Screenshot by author, 2025.

5 - AI Music

A library of musical material, composed using AI music generators Riffusion, Suno, and Udio then refined in Ableton Live, underpins the sonic landscape piped through the gallery system sound. The process involved going back and forth between AI tools and Ableton, by editing, remixing, and regenerating musical ideas to achieve specific sequences and textures thus creating a hybrid human-AI composition workflow of generating music. The AI-composed music is played through the gallery speaker system, creating an immersive sound environment heard by both audience and participants. This soundscape integrates with the live singing of the choir, blending human voices with AI-generated textures to form a layered, collective sonic experience. By integrating AI-driven composition with participant interaction, the software dissolves the boundaries between static and dynamic creation. Users contribute not just to thesoundscape but to the evolution of *The Ashari's* consciousness, making each experience unique and iterative.

6 - JSON Files, Framework, and Performance Model



The performance models are lead JSON files defining the arc of the performance with thematic descriptions and timing markers. This framework guides the evolving emotional journey, providing essential structure with specified durations of each section and an overall length of the performance within a fixed compositional arc modeled after the Golden Ratio. The Golden Ratio is important because it offers a proportional framework found throughout nature, art, and architecture, associated with balance, beauty, and organic growth. By using this mathematical model, my hope is the performance taps into a universally resonant sense of progression, helping the audience intuitively sense when tension, release, and resolution unfold amid the unpredictable and emergent qualities of live interaction. Below is an example of an audio clip:


```
"1-6.mp3": {
"duration_seconds": 129,
"sentiment_value": 0.0,
"dialogue": "The Ashari have witnessed their world crumble and rebuild, their people scattered by the winds of betrayal. They have no illusions of a return to greatness, only the cold clarity that survival, not morality, is the ultimate truth. They understand the value of wisdom over valor, for strength is only useful when tempered by the mind.",
"section": "Rising Action",
"story_arc": "0:00-6:43",
"bass": "D#2",
"tenor": "F#3",
"alto": "G#4",
"soprano": "C#5",
"max_gain": "1.0"
},
```


The audio library is stored in a JSON file where each track is paired with descriptions representing possible Ashari cultural states. This JSON is structured to help the AI make decisions efficiently—it organizes audio tracks alongside their emotional and cultural descriptors, giving the system clear parameters for selecting which sounds best match the Ashari's evolving state. This structure allows the AI to avoid random or chaotic choices and instead generate selections that are emotionally and narratively coherent, helping maintain the mood and flow of the piece.

DISCUSSION OF OTHERS' WORK:

I am drawn to exploring spaces that, though invisible, are undeniably alive. Through various mediums, I investigate the interconnectedness of all things, including my own place in the universe. This work draws from the influence of Pauline Oliveros, John Cage, Arone Dyer, and the psychological framework of Carl Jung, alongside other artistic references.

Jung's theory of the collective unconscious offers a foundation for understanding thought as shared and inherited. This aligns with The Ashari's evolving consciousness, which reshapes input through emotional and symbolic patterns. The AI system echoes Jung's notion of recurring myths and symbols by interpreting participant input within an expanding historical framework.[4]

A foundational influence on the musical composition of this installation is Pauline Oliveros' *Collective Environmental Composition*[5]. This work explores the act of deep listening as a means of engaging with an environment, fostering a heightened awareness of sound as shared and participatory. The score instructs participants to explore a space, identify listening points, and invite others to engage in the sonic landscape, ultimately creating a performance structure that is responsive to both the environment and the group's collective perception of sound:

> "Each participant explores an environment to find a listening place with something interesting to hear and listens for a while. Each participant invites the other participants to hear their found listening place. There may be one or more places with contrasting sounds. Each participant finds a way to enhance, nullify or otherwise interact with the sound or sounds that the group goes to hear. Each participant finds a way to connect all the sounds, either literally, metaphorically or graphically. A performance agreement is negotiated."[6]

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[4] Jung, Carl G. *The Archetypes and the Collective Unconscious*. Translated by R.F.C. Hull. 2nd ed. Princeton, NJ: Princeton University Press, 1981.
[5] Pauline Oliveros, *Collective Environmental Composition* (1975), reprinted in *Software for People: Collected Writings 1963–1980* (Baltimore, MD: Smith Publications, 1984), 196–198.
[6] Pauline Oliveros, *Collective Environmental Composition* (1975), reprinted in *Software for People: Collected Writings 1963–1980* (Baltimore, MD: Smith Publications, 1984), 196–198.

Barbara Rose Lange's analysis of Oliveros underscores the ethical and collaborative nature of collective improvisation, where tension and unity coexist. Similarly, *Transmission* invites participants to negotiate sound, movement, and meaning through real-time prompts, dissolving the boundary between human and system.[7]

Arone Dyer's explorations of voice as a communal tool foundationally contributing to the distributed vocal interactions in this piece.[8] Participants navigate space and sound, responding to digital and human cues, blurring the lines between individual agency and collective emergence.

Figure 7. Instagram video still of Dronechoir SYLLABA performance at Revolve Gallery, Asheville, NC. Screenshot by author, 2025.

John Cage's *Indeterminacy* informs the unpredictability of *Transmission*.[9] Like Cage's integration of chance operations, the AI system generates open-ended sonic responses to text input, shifting authorship away from a fixed composer and embracing real-time co-creation.[10]

José Maceda's *Cassettes 100* similarly explore collective participation, blending analog and digital soundscapes to create immersive environments.[11] Phil Kline's *Unsilent Night*[12] is a participatory, site-specific sound installation that transforms city streets into a dynamic, evolving

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[7] Lange, Barbara Rose. "The Politics of Collaborative Performance in the Music of Pauline Oliveros." *Perspectives of New Music* 46, no. 1 (2008): 39–60. http://www.jstor.org/stable/25652375.
[8] A. D. Dryer, "Dronechoir," Arone Dyer, https://aronedyer.com/013 (accessed Mar. 7, 2025).
[9] John Cage, *Indeterminacy - John Cage (1959) - Full LP Recording*, YouTube video, 1:06:56, posted by "elbowsymmetry," September 30, 2014, accessed [Mar. 7, 2025],
[10] John Cage, *Indeterminacy: New Aspect of Form in Instrumental and Electronic Music* (Folkways Records, 1959), LP, reissued on Smithsonian Folkways, 1992.
[11] José Maceda, *Cassettes 100*, 1971, re-staged by Aki Onda at Kanagawa Arts Theatre, Yokohama, Japan, 2019, *The Wire*, 2019,
[12] Phil Kline, *Unsilent Night*, 1992–Present, Various Locations, accessed [Month Day, Year], https://unsilentnight.com/.

musical experience. First performed in 1992 in New York City, the piece invites participants to carry portable speakers playing one of four synchronized ambient tracks as they walk together, creating an immersive, ever-changing sonic environment. The music, composed of shimmering electronic tones and bell-like textures, interacts with urban architecture, reflections, and movement, making each performance unique. This work is relevant to my research as it explores sound as a collective and spatially responsive medium, demonstrating how memory and sonic experience are shaped by communal participation and environmental context.[13] Phil Kline's *Unsilent Night* further connects, transforming public space into a shared sonic experience shaped by participants' movement, reinforcing the idea that memory and sound are deeply communal.

Figure 8. Screenshot from Aki Onda Presents José Maceda's Cassettes 100 at KAAT Kanagawa Arts Theatre. Screenshot by author, 2025.

Why This Work is Important

Transmission challenges deeply rooted assumptions about individuality, memory, and authorship in contemporary culture. It highlights the power of collective memory and interaction in shaping not only art but also our understanding of identity, belonging, and the creative process itself. In a time when digital technologies often isolate us, *Transmission* offers a model for using AI and interactive systems to foster connection, reflection, and co-creation, demonstrating how technology can serve as a bridge rather than a barrier between individuals.

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[13] WNYC, *Phil Kline's "Unsilent Night" Celebrates 20th Year*, YouTube video, 4:13, posted by "WNYC," December 17, 2012, accessed [March 8, 2025], https://www.youtube.com/watch?v=WzN1BJDegHo&t=94s.

The use of AI in art is especially important and controversial, raising questions about authorship, creativity, and agency. *Transmission* confronts this controversy head-on by positioning AI not as a replacement for human creativity but as a collaborator and co-creator. It invites audiences to reconsider assumptions about the role of technology in the creative process and challenges the fear that AI diminishes human expression. Instead, this work demonstrates how AI can amplify, shape, and deepen the textures of artistic experience, expanding rather than limiting the possibilities of collective creation.

At its core, this project is an exploration of how artificial intelligence and algorithmic processes can serve as both a compositional tool and a performative entity within experimental live music. By blurring the roles of composer, performer, and audience, the AI challenges traditional hierarchies in music-making, reinforcing the notion that composition is an ongoing, participatory act rather than a static artifact. This integration of AI-driven decision-making within performance parallels the ethos of open-form and indeterminate compositions pioneered by artists like Pauline Oliveros, and John Cage where sound is not imposed but co-created through interaction and environment. In this way, the computer serves as both the brain of the composition and the space in which it unfolds, reinforcing the role of computers as a dynamic force in expanding the boundaries of musical experience.

Conclusion

At the heart of this project emerges a shared field of influence within a vast collective atmosphere where perception is shaped through interaction, dialogue, and reinterpretation. This paper has explored how *Transmission* integrates live sound performance using artificial intelligence and computers serving a role in live music challenging the boundaries between individual and collective artistic experience. In dissolving the boundary between performer and system, *Transmission* proposes that cognition itself is a form of collaboration—where each contribution, no matter how fleeting, leaves an imprint on the whole. The performance does not

merely depict memory; it performs its evolution, allowing participants to engage in a space where all intertwine, continuously reshaping the sonic and conceptual fabric of the work. Perhaps our own version of self is nothing more than a collection of millions of mirrors merely looking, only to find more than what we thought.

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SKETCHBOOK

THE ASHARI

(Python)

DroneChoir WebApp

(React.js)