

Embodied Dialogues: a site-specific performance

JENN KIRBY, University of Liverpool, UK

IRIS GARRELF'S, Goldsmiths, University of London, UK

1 Program Notes

Embodied Dialogues is a collaboration between Jenn Kirby and Iris Garrelfs that affords a flexible performance framework using wearable digital musical instruments (DMIs). In this iteration, both collaborators perform together using sensor-based garments: a *Sensor Shirt* worn by Kirby and a *Sensor Dress* worn by Garrelfs. Touch and movement activate site-specific sound materials stored within the garments, which are projected into the space using hand-held speakers. A dialogue emerges between recorded sounds, unamplified voice, and space, resulting in an intimate, spatially situated experience that foregrounds the shared agency of performer and technology.

For this performance, the artists' work with pre-recorded sound materials comprising spoken word, environmental field recordings, and sounds engaging with the history and heritage around the location of the performance venue, Rich Mix, London. These are juxtaposed with live improvised vocal elements that move between abstraction and articulation, responding in real-time to the recorded sounds, the performance space, and its surrounding environment.



Fig. 1. Kirby (left) and Garrelfs (right) performing with sensor-garment. Photos by Daryl Feehely

2 Project Description

Embodied Dialogues is a collaboration between Jenn Kirby, a composer, performer and creative technologist and Iris Garrelfs, a vocal improviser usually working with lo-fi wearable electronics and site-specific elements. The project explores the intersection of site-specificity, wearable technology and extended vocal improvisation, using motion and touch-sensitive wearable instruments, as a platform for embodied interaction.

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The project began in early 2025 and was developed during a *Voices from the Edge* residency at AMATA, Falmouth University's Arts Centre, in July 2025. Initially conceived as a solo performance for Garrelfs using the *Sensor Dress*, the premiere took place at the V&A East Storehouse, London in November 2025 as part of the CMMR conference [1]. For NIME 26, *Embodied Dialogues* is expanded to include both collaborators in performance, with Garrelfs using *Sensor Dress* and Kirby using *Sensor Shirt*.

The wearable instruments use Kirby's ToMES system, which integrates touch, movement, and sound within a standalone architecture, to produce a customisable DMI that operates independently of external computing platforms. One advantage of this independence is that it mitigates risks associated with software and operating system changes, helping to ensure reproducibility and long-term viability of artistic works realised with the system. Platform dependence is a known challenge within the NIME community [2] with Morreals & McPherson reporting a significant restriction to instrument longevity if the system is "tied to an old version of specific software that does not reliably run any longer" [3].

ToMES Technical Design and Implementation

Using a Teensy 4.1 development board and Audio Shield (Rev D), audio files are loaded from a microSD and processed on the board. For sensing, a BNO055 (9-DoF) is used alongside an MPR121 for capacitive touch inputs. The garments feature conductive fabric patches sewn inside with wires routed to the electronics housed in a 3D printed enclosure. Audio can be transmitted wirelessly using a wireless audio pack or via a mini-jack cable to a handheld speaker. The functionality of ToMES is customised and the attachments and placement of sensors on the garments is done in collaboration with the performer, allowing the system to be tailored specifically for the performer's body.

The user/wearer can customise the system's behaviour by editing CSV files and uploading audio files. These CSV files provide access to a range of customisation possibilities without requiring code changes, enabling non-coders to configure the system for different performances and creative contexts, as required by the site-specific nature of *Embodied Dialogues*.

Audio files are organised into sound banks and triggered through contact with garment-based touchpoints. Each touchpoint is mapped to specific audio files across sets in each sound bank, with activation, selecting sounds from Set A with 80% probability and Set B with 20%. This weighted probability favours recurring materials while allowing rarer variants to punctuate phrases. Effects, including granular synthesis, playback speed, and reverb are applied with parameters controlled by motion sensor input and a time-based score system read from the microSD card. The score defines the active sound bank, touch-mode, and the effects' parameter ranges.

Table I. Customisation and Mapping

Parameter	Description
Timestamp	A time-based score that defines when parameter changes occur, allowing specific behaviours and parameter changes at predefined points in time
Capacitive touch sensitivity	Configures the responsiveness of the capacitive sensors and is calibrated for each garment to achieve the desired triggering sensitivity
FX	Controls audio effects parameters, including reverb, delay, granular synthesis processing applied to the sound output.
Playback speed scale	Defines the allowable range of playback speed variation, the precise speed within this range is continuously mapped to motion sensor data
Sound bank	Selects which bank of preloaded audio files is currently active and available for playback
Touch mode	Defines how sound playback behaves in response to touch input, such as continuous playback after triggering or playback only while a touchpoint remains active.

Performance and Site-Specificity

The customisation of the system allows each performance to respond to its specific performance space, whether indoors or outdoors. During the performance Kirby and Garrelfs move among the audience and performance space creating what an audience member from a previous event described as a “moving bubble of experience”.

While recorded sounds are amplified via Minirig speakers held and moved around by the performers, the voices remain unamplified. A multi-layered dialogue unfolds as the performers move through the space: between their bodies and voices, the recorded sounds that travel with them via handheld speakers, and the environment itself, which contains, reflects, and animates the sonic interplay. This use of a portable speaker system changes how sound is experienced by both the performer and audience depending on where it is positioned, for example, close to the ears or behind the body. Performers are able to position the speaker to create different spatial effects, including directing sound towards individual audience members. Thus, an intimate, spatially aware experience is created for the performers and for the audience alike [4].

The pre-recorded sound materials explore the area surrounding the performance venue. This is achieved through spoken word (ranging from overheard conversations, author narrative and oral history), environmental field recordings in the area, and material excitations of local features. Live voice material incorporates abstract sounds alongside site-specific articulation. This overlay of pre-recorded and situated approaches enables a dialogue with a multidisciplinary understanding of place and place-making [5]. As a site-responsive work, *Embodied Dialogues* “recognises the complex dynamic relationships at play within a performance, and explores them in ways that may offer participatory and socially engaged experiences” [6].

By bringing bodies, technologies, spaces, and situated histories, together within a flexible performance framework, each performance invites audiences into a shared, embodied listening experience shaped by the specific social and spatial context in which it unfolds. Physically untethering from the stage and front-of-house sound systems, enables mobility, direct audience engagement, and site-responsive navigation. Wearing a sensor-based garment in combination with site-specific sound and voice forms a performance ecology that connects body, space, and sensing technologies, blurring boundaries between digital and analogue, and between physical and informational domains, characteristics of current postdigital conditions [7].

Through this integration of wearable DMIs, mobile amplification, and vocal improvisation, the project distributes agency across performers, technologies, audiences, and environments. In doing so, *Embodied Dialogues* supports an evolving embodied improvisational practice and offers a model for wearable DMI design that prioritises artistic longevity, contextual responsiveness, and embodied knowledge, while critically engaging with questions of place within contemporary music performance.

3 Technical Notes

The performance is a locative work in which both performers move among the audience. It is self-contained and requires no additional amplification beyond the handheld speakers. The performers will bring the sensor-garments and handheld speakers. Soundcheck is required to ensure a balance between the performers and to establish navigation through the space.

4 Media Links

- Video: <https://youtu.be/592GWuhfnRc>
- Audio: <https://soundcloud.com/iris-garrelfs/embodied-dialogue-va-rehearsal-extract>

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Ethical Standards

This practice-based research project investigates embodied musical dialogue in performance and the design and customisation of wearable instruments. The performers acted as collaborators and co-authors through the design process, conducting making and improvisation workshops. Given the wearable nature of the work, we focused on comfort and safety. We iteratively adapted the instruments using our notes from the workshops. We aim for sustainability of the project through customisation work with the instruments and shared knowledge of their inner workings.

References

- [1] I. Garrelfs and J. Kirby, "Embodied Dialogues", *Computer Music and Multidisciplinary Research (CMMR 2025)*, London, U.K., Nov. 2025. [Online]. Available: <https://cmmr2025.prism.cnrs.fr/performances> [Accessed: Apr. 28, 2026].
- [2] A.-N. Niyonsenga and M. Wanderley, "Tools and Techniques for the Maintenance and Support of Digital Musical Instruments", in *Proceedings of the International Conference on New Interfaces for Musical Expression*, Mexico City, Mexico, May 2023, pp. 212--218. doi: 10.5281/zenodo.11189159.
- [3] F. Morreale and A. McPherson, "Design for Longevity: Ongoing Use of Instruments from NIME 2010-14", in *Proceedings of the International Conference on New Interfaces for Musical Expression*, Copenhagen, Denmark, Jun. 2017, pp. 192--197. doi: 10.5281/zenodo.1176218.
- [4] I. Garrelfs and J. Kirby, "Embodied Dialogues: An Improvised Duet Between Sensor Dress and Voice," in *Proceedings of the International Computer Music Conference (ICMC 2025)*, Boston, MA, USA, Jun. 2025, pp. 176–179.
- [5] D. R. Williams, "Making sense of 'place': Reflections on pluralism and positionality in place research", *Landscape and Urban Planning*, vol. 131, pp. 74–82, Nov. 2014, doi: 10.1016/j.landurbplan.2014.08.002.
- [6] L. Hayes, "From site-specific to site-responsive: Sound art performances as participatory milieu," *Organised Sound*, vol. 22, no. 1, pp. 83–92, Apr. 2017. doi: 10.1017/S1355771816000364.
- [7] P. Jandrić, A. MacKenzie and J. Knox, Postdigital "Research: Genealogies, Challenges, and Future Perspectives", *Postdigit Sci Educ* 2024, 6, pp. 409–415