

# Deep

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Additional Key Words and Phrases: Voice, Embodied Knowledge

## 1 Program Notes

Deep is a live electroacoustic performance for voice, wearable biometric interface, and real-time granular processing. The piece originates from a personal sound diary recorded during a period of oncological treatment. In that time, the voice was not approached as a refined instrument, but as a living trace—capturing breath, fatigue, instability, and resilience. These recordings now form an archive of embodied memory. During the performance, the singer wears a collar-based interface that measures heart rate and transmits physiological data to a Pure Data system. The archived vocal fragments are processed through granular synthesis, while live vocal material—improvised in response to the performer’s present physical and emotional condition—enters into dialogue with these past traces. The performer’s heart rate continuously influences the density, timing, and transformation of the electronic texture. Physiology is not treated as a neutral control parameter but as an expressive force: internal states become audible, shaping the unfolding sonic landscape in real time. Each iteration of Deep is different. The live voice negotiates with its recorded past, creating a layered temporal space where memory is fragmented, stretched, and reassembled. The work unfolds as an encounter between present awareness and archived vulnerability. Deep is not a narrative about illness. It is an exploration of depth—of breath, of listening, of being alive in the immediacy of the body.

## 2 Project Description

Deep is a live electroacoustic performance that integrates embodied vocal practice, autobiographical sound material, and wearable biometric sensing. The project originates from a self-authored audio diary recorded during a period of oncological treatment. Rather than documenting events through language, the diary captures physiological and affective states through vocal traces—breath patterns, unstable timbres, interrupted phrases, and moments of silence. These recordings constitute an archive of embodied memory that serves as the primary sonic material of the work. In performance, the singer wears a custom-built collar interface (originally designed with a different purpose as outlined in [1]) based on an ESP32 microcontroller. The device integrates a photoplethysmography (PPG) sensor for heart-rate detection, rotary potentiometers for manual control, and haptic feedback through a vibration motor. Biometric and control data are transmitted via OSC to a Pure Data environment. Within the software system, archived vocal recordings are processed through granular synthesis. Parameters such as grain density, duration, playback position, and spectral transformation are continuously modulated by both heart-rate data and performer gestures. This creates a feedback loop in which internal physiological states directly influence the unfolding sonic texture. The performance is semi-improvised. Live vocal material is selected in the moment according to the performer’s current physical and emotional condition. As a result, each iteration of Deep is unique. The work establishes a temporal dialogue between past and present: recorded traces of vulnerability are reactivated and transformed through live vocal agency. Deep reframes biometric data not as neutral control input but as expressive compositional material. The piece situates the body—its fragility, memory, and physiological rhythms—at the center of musical form, proposing an understanding of voice as an embodied site of knowledge and transformation. Singer statement: Given the unique positionality of the singer within the project, before presenting some collective discussion on our project (developed by the three authors), we report here a self-reflection of the singer (first author of this manuscript) on her own position and her relationship with her medical condition. The creation of this piece is rooted in an experience of profound vulnerability and, paradoxically, extraordinary awareness. During my cancer journey, I began recording my voice not as a professional artist perfecting each note, but as a witness to myself. Those recordings composed a sound diary—an autoethnographic archive where scales, fragments of melodies, and raw sounds documented my state in real time. It was not music in the traditional sense; it was the sonic trace of my resistance and my fragility simultaneously present.

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*NIME '26, June 23–26, 2026, London, UK*

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Fig. 1. The performer with the collar.

The voice, in this context, assumed a crucial double function. On one hand, it was tangible proof that I could still sing, that illness had not completely colonised what defines me as a musician. On the other hand, it was a faithful recording of how my body and mind were responding: every laboured breath, every involuntary pause, every timbral nuance revealed the truth of my condition. There was no possible filter. The voice does not lie: tone, inflexion, and emotional arousal communicate instinctively to the listener the state of the person singing, far more than any verbal description could. What we often forget is that our body communicates constantly through the voice. In this sound diary, that voice had become the faithful interpreter of my condition: not a "sick" voice to hide, but a voice that honestly told how I was facing illness moment by moment. The voice of cancer was waking me up, transforming me, stripping away everything inessential. When we decided to transform these sonic fragments into an actual composition, the process was not simply a collection of recordings. We assembled significant parts of the diary and integrated them into a sound collar—a structure that could accompany me during the video performance, allowing me to improvise over these tracks as if I were in dialogue with a previous version of myself. Listening to these sounds again is an experience that moves me deeply every time. What I can hear is not only suffering: it is the entire journey in all its complexity. Illness, however heavy, was not merely a terrible thing. It was a forced opportunity to inhabit the present, to truly dwell in life, in today. Illness is a life accelerator that glues you to the present moment in a way nothing else can. It is true that illness is serious for the body, yet my journey brought me love in a measure I rarely experience in ordinary life, cluttered with commitments and errands that distract us. That voice I hear again is not solely the voice of my past: it is the present whispering our mortality, our shared vulnerability. It is the care that comes from being present, not from medicine alone. The sounds in this piece are voices in suffering—this is undeniable. But each time I listen to them, they remind me of the present, of the love received, of genuine care. They are testimony to how even in the darkest moments, awareness of our being alive—truly alive—becomes the most powerful remedy. This piece, therefore, is not music about illness. It is music about life, captured in the moment when life reveals itself in its rawest truth.

### 3 Technical Notes

Deep is a live performance for voice, wearable biometric interface, and computer-based sound processing.

The performer wears a custom collar that senses heart rate and transmits physiological data wirelessly to a laptop running Pure Data. Pre-recorded vocal materials are processed in real time through granular synthesis. Live vocal input and biometric data continuously shape the electronic texture. The performance is semi-improvised and unfolds as a dialogue between archived vocal traces and present vocal expression. Each iteration is unique and responsive to the performer's current physical and emotional state. The performers provide: Microphone, the collar, laptop and audio interface, internal mixing and sound processing (handled in Pure Data)

The venue is required to provide: Stereo input to the house PA system

#### 4 Media Links

- Video: [https://drive.google.com/file/d/1zTOBHVBi6FnQXpe7niB-21LjEX38Ej-\\_/view](https://drive.google.com/file/d/1zTOBHVBi6FnQXpe7niB-21LjEX38Ej-_/view)

#### 5 Ethical Standards

The paper is based on a self-reflective process touching on a sensitive topic. However, given that the author reflects on their own experience, no privacy or ethics issues are present. First author is currently doing a PhD with funding from conservatorio di Terni.

#### References

- [1] Nicolás Merendino, Antonio Rodà, and Raul Masu. 2024. “Below 58 BPM,” involving real-time monitoring and self-medication practices in music performance through IoT technology. *Frontiers in Computer Science* 6 (2024), 1187933.