

Catching Sparks

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1 Program Notes

In Catching Sparks, up to three participants at a time can use small keyboard peripherals to catch sparks from a spinning wheel. These sparks, which come in different colors and respective sonic palettes, can be consumed to initiate a short (20- to 30-second) improvisation environment in which the player presses buttons to “perform” the spark. Sparks can also be passed to other players, and there are sonic and visual incentives to spreading the wealth if the wheel favors one player more than another.

The ultimate goal, discovered on purpose or by accident, is to have three improvisors playing different sparks at the same time, which yields a rich, vibrant visual and sonic display (however short-lived). This piece concretizes a metaphor I think about often for creative inspiration and its subsequent expression. One must be in the right place and have the bandwidth to “catch” these bits of inspiration, and it is often more fruitful to collaborate in many expressive situations.

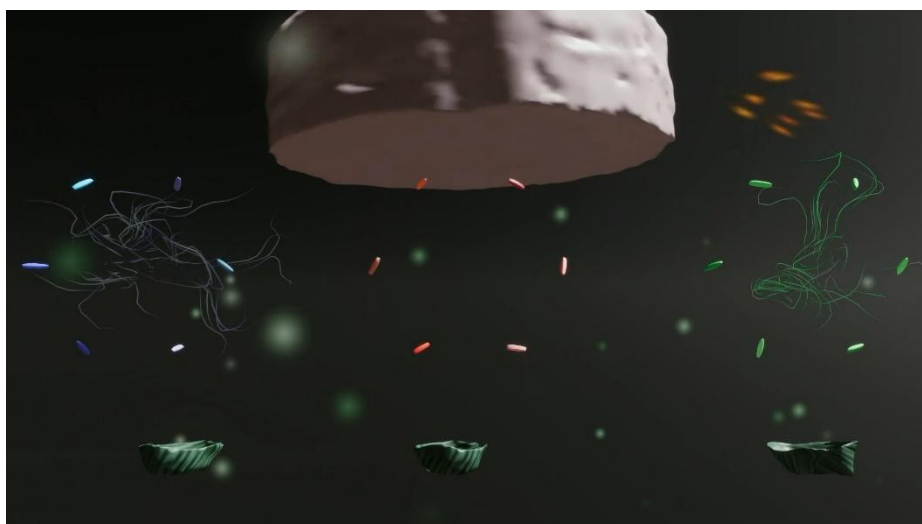


Fig. 1. A screenshot of three players consuming different sparks.

2 Project Description

Play is a powerful environment for lowering inhibitions. The suspension of consequences allows players to enter unfamiliar situations with lessened fear of a negative outcome. I've found games as magic circles (in the sense of Huizinga [1]), or rather playframes (as Pearce [2] aptly identifies as less problematic than Huizinga's initial conception), to be welcoming spaces for participants with differing or no musical backgrounds to feel comfortable in engaging with collaborative sound production, which summarizes my primary research interest. This interest in uniting performers of diverse musical experience led me to create *Catching Sparks*.

Catching Sparks is an interactive, collaborative, improvisatory audiovisual installation. As attendees wander through the space, they might overhear the welcoming hum of the ambient soundscape. Once lured, participants sit down and attempt to catch sparks (go figure) emitted from a grinding wheel in the video projection sky. Up to three players control on-screen receptacles using relatively simple USB peripherals stationed at tables in the installation space.

I developed *Catching Sparks* over the course of a month-long artist residency at the Zentrum für Kunst und Medien (ZKM) in Karlsruhe, Germany. The piece was showcased during Karlsruhe's open museum night, during which around 200 different participants experienced the installation. The linked documentation video is a tutorial-like introduction to *Catching Sparks* with footage from the premiere at ZKM.

3 Technical Notes

This piece is constructed in Unity (interaction and visuals) and SuperCollider (audio processing) running Zirkonium (spatialization software) on a Mac Studio (M1 Max with 32GB of RAM). As this is a participatory installation, audience members comprise the performers! Each audience member sits at a station with a USB peripheral macro pad with six buttons and a knob, pictured here:



Fig. 2. A USB macro pad controller for *Catching Sparks*

By mapping the available inputs (e.g. button presses, knob turns) to customized sets of keyboard inputs, these become game controllers for the Unity game engine. I mapped the top row of buttons to logistical management of sparks caught by the player, while the bottom row only becomes active once the player “uses” a spark to enter the short improvisation environment. These are the controls provided to the players (originally bilingual in the Germany premiere):

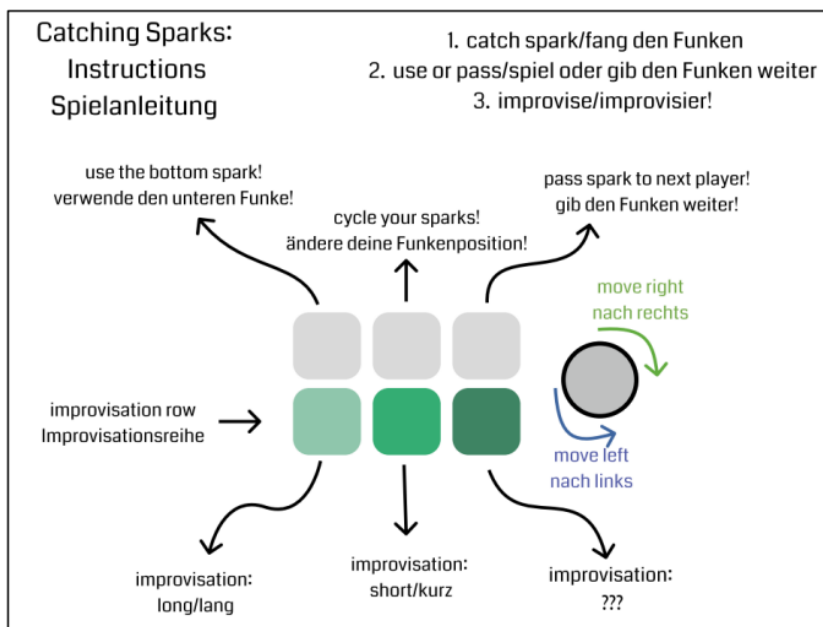


Fig. 3. Information on the controls provided to participants.

As shown above, the improvisation buttons correspond to long, short, and mystery gestures. Each spark’s sound palette is inspired by elemental allusion: the red sparks have crackly, fiery sonic characteristics, while blue sparks yield watery timbres and green sparks feature more grounded sounds. By providing only three buttons as the primary improvisatory interface, players are able to learn the system quickly, encouraging them to potentially experiment more and express their musical ideas with clarity.

The sounds produced in the improvisation section are constructed from fundamental unit generators in SuperCollider (e.g. square, sine, and saw waves) filtered and tuned to different tonal centers according to a cycling chord progression that governs and updates the tonal content of all sound effects. These highly-electronic musical components contrast with the acoustic piano-centric sound design of the rest of the environment.

Typically, *Catching Sparks* is set up in a space of about 14 by 11 feet (4.27 by 3.35 meters). It requires three small tables, ideally with accompanying chairs, arranged in an arc facing a central screen (projected or physical). The piece, originally designed for a 47-speaker dome, works best with at least six speakers, but can be done with as few as four. The spatialization focuses on immersing the players in the wheel environment: the whirring of the wheel rotates through the space (via OSC control of Zirkonium from Unity), while the player-made sounds are localized via interpolation to each player’s station. Each table will contain a USB peripheral (provided by me) for controlling the system, and all connections will run to a computer stationed behind the screen. Please see the diagram below for a visualization.

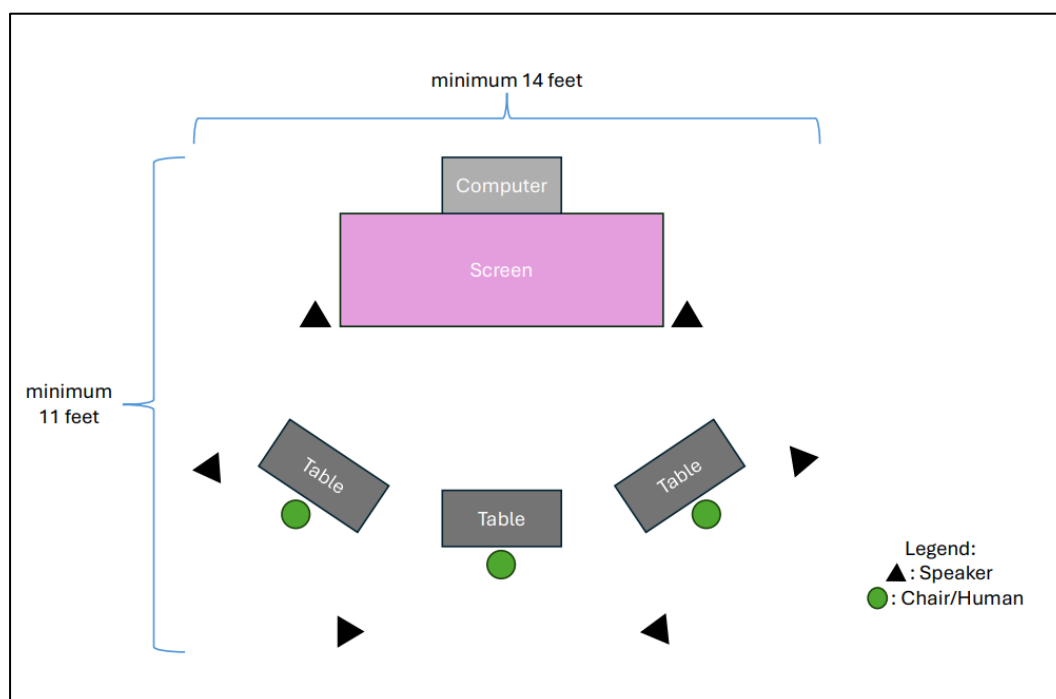


Fig. 4. A diagram of the setup for *Catching Sparks*.

The installation can run for as long as several hours, but participants (in my experience) typically interact with it for between five and fifteen minutes.

4 Media Link(s)

- Video: <https://vimeo.com/895179107/1e8f9f3deb>

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Ethical Standards

This project did not involve research with people or animals and was funded solely through Stanford University's Graduate Research and Internship Program in Germany (GRIP) grant. No generative AI was used in the creation of this piece or paper.

References

- [1] J. Huizinga, *Homo Ludens: A Study of the Play-Element in Culture*. Boston, MA, USA: The Beacon Press, 1971.
- [2] C. Pearce, *Playframes: How Do We Know We Are Playing?* Cambridge, MA, USA: The MIT Press, 2024. <https://doi.org/10.7551/mitpress/15344.001.0001>.