Professor Sabine
CART 351
Nov 12, 2025

Jolene Bodika
John Compuesto

# PROJECT II

## Ideation

Our project is an interactive and creative soundboard that randomizes sounds and reacts dynamically to the user's mouse movements. The concept was inspired by simple online soundboards that play preset effects, like laughter or applause, and expanded into something more ambient and generative, similar to web-based experiences such as *Infinite Afternoon*. The goal was to create an environment where sound reacts to movement, allowing users to generate an improvised composition simply by navigating the screen.

The creative soundboard uses the position of the mouse as a central instrument. As the user moves across the interface, the system dynamically alters the frequency and speed of the sound, creating a sense of musical space. The experience encourages playful exploration, where every movement becomes a note and every direction a new rhythm.

## How it works

The soundboard reacts to mouse position in real time using three axes of control:

- **Y-axis (frequency):** The higher the mouse moves, the higher the pitch becomes; moving downward lowers the tone, creating a smooth vertical gradient in sound.

- **X-axis (speed):** Moving to the right increases playback speed; moving to the left slows it down, letting users shape tempo through horizontal motion.

- **Click interaction:** A central "Play" button requests the user's volume access before sound begins.

The background maintains a dark, minimal aesthetic to focus attention on the motion. The cursor is transformed into a glowing circle, followed by a faint echo or "ghost" trail to visualize sound flow.

At the bottom left of the interface, a **circular map** acts as a visual tracker of the user's position, inspired by video game minimaps. The map continuously updates with coordinates as the mouse moves, creating a sense of navigation through an audio space rather than a visual one.

## Motivation and Intent

Our project takes inspiration from classic online **soundboards**, the playful interfaces that let users trigger short sound effects like laughter, coughing, or ambient noises. We were fascinated by how these simple tools could evoke emotion and curiosity through just a few buttons. However, instead of creating a fixed grid of sounds, we wanted to expand this concept into something more **fluid and generative**, where sound emerges from movement rather than clicks.

We were also inspired by **generative ambient sound experiences** such as *Infinite Afternoon*, which blend sound, randomness, and interaction to create immersive, meditative spaces. These experiences often have no defined goal or ending; they simply let users explore sound as an evolving landscape. Our project builds on this idea by combining it with visual feedback and spatial interaction, turning the user's screen into a kind of digital instrument.

The intent behind the project is to make users *feel* their interaction with sound. We want the experience to feel intuitive and responsive, something that encourages experimentation and play while still maintaining a sense of calm and discovery. Each movement of the mouse becomes an act of creation, generating tones and echoes that connect physical motion to digital expression.

We also used this heatmap for our 'hotspots',  this feature is our collective representation to count the user data of past users showing it to the front end of the current user.

## Technical Implementation

The project is coded in **p5.js**, with **Tone.js** handling real-time sound synthesis and modulation. Mouse coordinates are continuously tracked and mapped to specific sound parameters, such as oscillator frequency and playback rate.

To introduce a collective layer, the project integrates **Heatmap.js**, an open-source JavaScript library that visualizes activity density. Each mouse movement adds a data

point with its (x, y) coordinates and intensity value. These points are then visualized as “heat” on the minimap, revealing where users have interacted the most.

Optionally, using a simple **Flask** backend, these coordinates can be stored in a data.json file, allowing future users to see accumulated popular coordinates from everyone who previously used the interface. The program reads a json file to gather the data of all previous users to display the heatmaps. The current user can decide to listen to the calming sounds or more noisy sounds based on where they navigate on the page. Once they are finished they can decide to save their coordinates to listen at a later date or simply close the application. If the user chooses to save their data, a post request is made to the server and their name and coordinates will be added to a JSON file. This information is displayed on the data page to show other users their listening experience.

## Collective Representation

The heatmap acts as a collective memory of user interaction. Areas where users linger or move frequently appear as brighter “hotspots” on the minimap, visually representing shared attention and curiosity. Over time, these hotspots reveal patterns in how people explore sound, where they slow down, experiment, or discover a resonant frequency.

By layering all user data together, the interface evolves beyond a single-user experience. It becomes a generative collaboration, each visitor leaving behind an invisible sonic fingerprint that shapes the next participant’s journey. The heatmap doesn’t just visualize movement; it reflects the collective behavior and sonic tendencies of everyone who has engaged with the project.

## Expected Outcome

The intent of this project is to transform sound interaction into a visual and spatial experience. By using intuitive motion instead of traditional sound controls, the user becomes both the composer and performer. The dark interface and glowing cursor draw focus to movement, while the generative nature of the sound encourages exploration rather than precision.

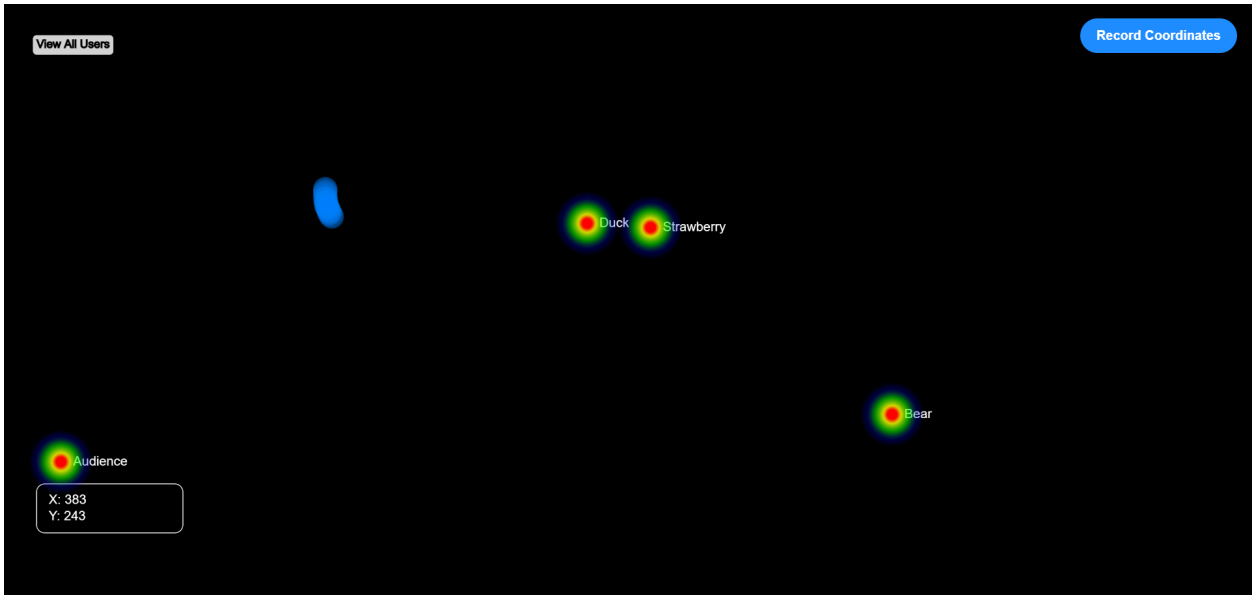
The collective heatmap adds an additional emotional layer, it shows evidence of presence, of others who have interacted before. Each trace becomes part of an evolving composition that never truly resets, making every visit unique yet connected.

Jolene Bodika
John Compuesto 4

Ultimately, the creative soundboard invites users to *listen visually* and *move calmly*, blurring the boundaries between play, relaxation, and digital spaces.

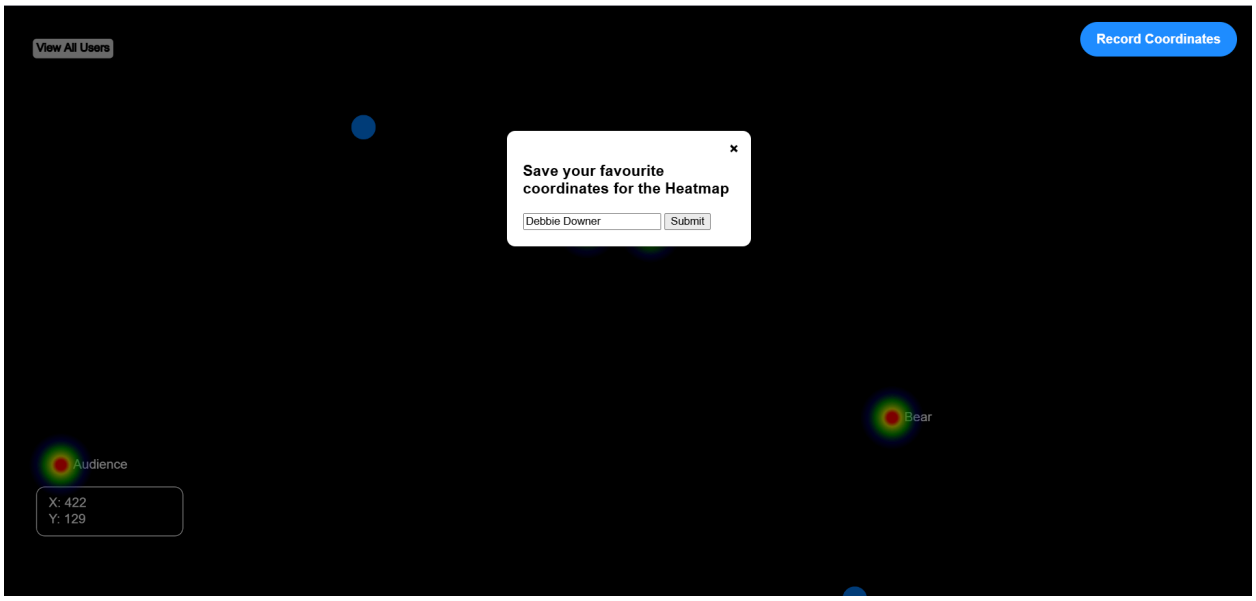
## Screen Captures


The user moves around to explore the different sound combinations available.



Jolene Bodika
John Compuesto 5

The user can enter their name so they can be identified on the logs.




Once the user submits their name they are presented with a table with all the past user's names and their most visited sounds/coordinates.

Jolene Bodika
John Compuesto 6

REFERENCES

Daniel Setzer (dsetzer):
https://gist.github.com/dsetzer/db50397e99e8e4de915c27e851c69767 We used this function to help map values.