



"The Body Groove"

Abstract

This project delves into the realm of embodied music interaction, exploring innovative ways of engaging with music through physical interaction. The project created a 'touch-free' musical device that turns physical movements into sounds and music. The objective is to assess how various musical attributes influence participants' engagement and satisfaction during the interaction process, opening up a world of possibilities in terms of inclusive music-making.

Introduction

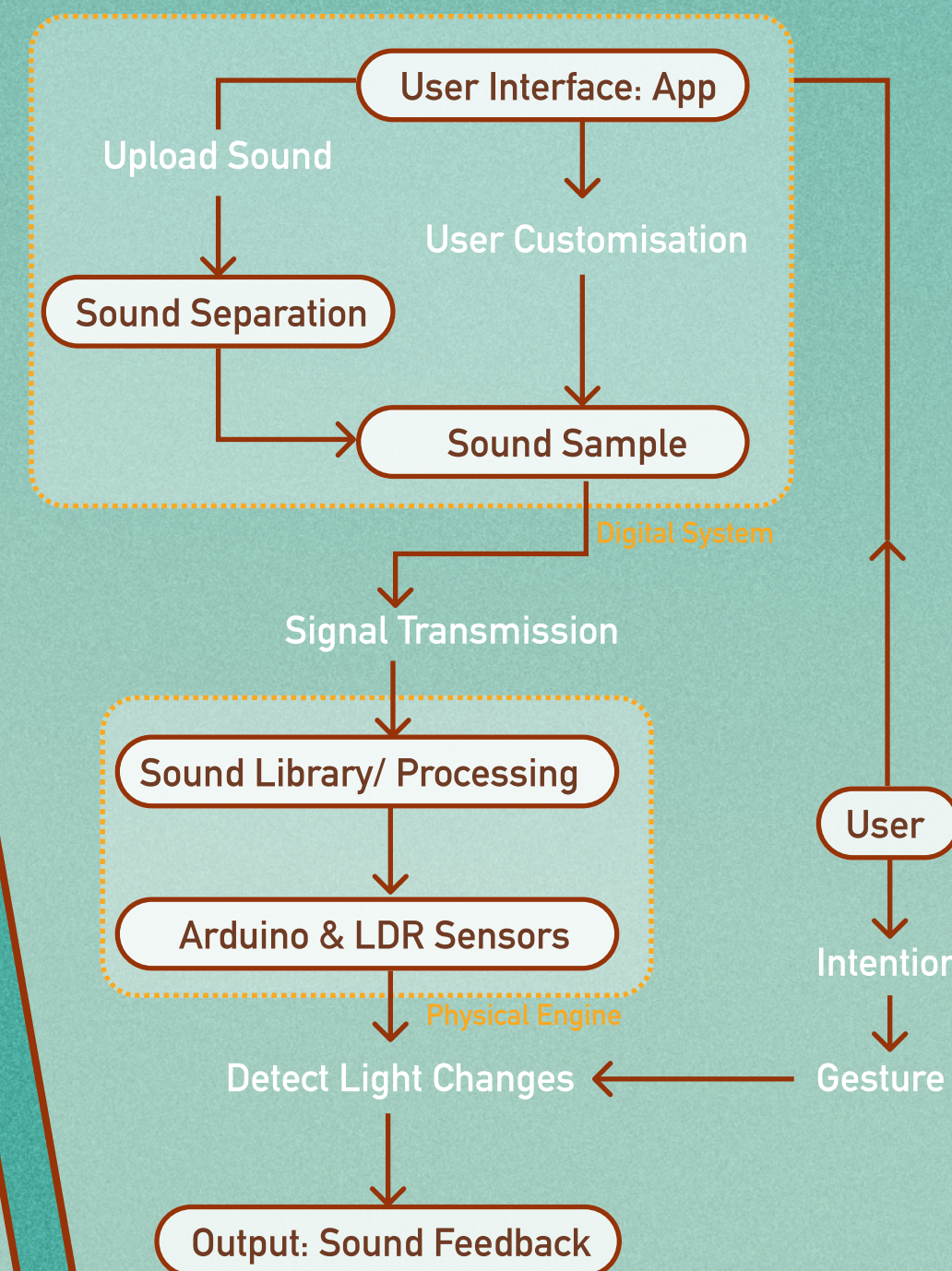
The fusion of sound with bodily movements has led to the emergence of a paradigm in music cognitive science (Godøy and Leman, 2010) where music is not just heard but also felt and physically engaged with. Body-centred music interactions have received a lot of attention as advances in artificial intelligence ("Body Synth," n.d.), and sensor technology (BareConductive) provide new avenues for user engagement. However, the relationship between user experience and these innovative modes remains under-explored.

This study delves into the design and user perception of a tangible digital musical instrument (DMI) prototype, highlighting the balance between spontaneity and structured sound generation. The study seeks to understand the impact of engagement patterns, musical preferences, music background and the influence of sound attributes on participant interactions.

Design

An interactive installation that generates a sound environment in response to subtle body movement

Workflow



Methodology

Feasible Assessment

- Exploration of Sensor Types
 - IR Break beam sensor
 - Motion sensor
 - LDR sensor
 - Touch Board

Rapid Prototype

- Minimum Viable Product
- Physical Layout Study

Process-Driven

- Pre-set Sound Processing
 - Task Identification
- User Interaction Flow
 - System Mechanism
 - Workflow
 - User Interface

Prototype Testing

- Quantitative Method
 - EMG Tracking
- Qualitative Method
 - Observation
 - Think aloud
 - Semi-structured Interview

Conclusion

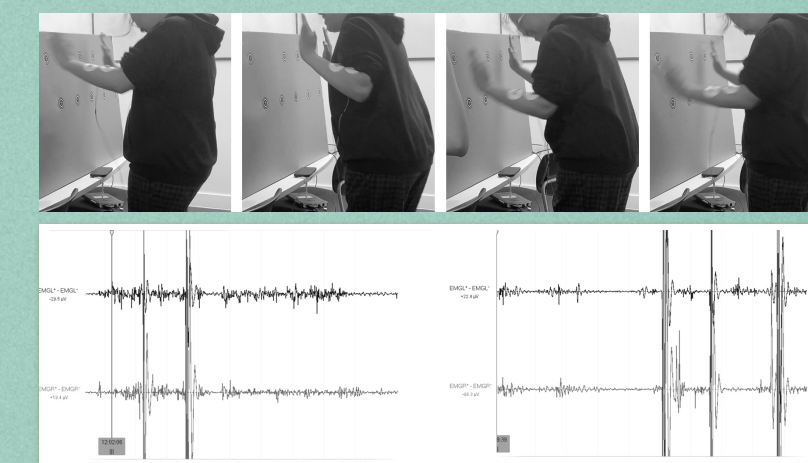
The BodyGroove project, anchored in the principles of Embodied Music Cognition, integrates technology with musical expression in a sophisticated manner. It balances spontaneous creativity with structured composition, and empirical feedback underscores its potential in embodied musical interactions.

Future Work

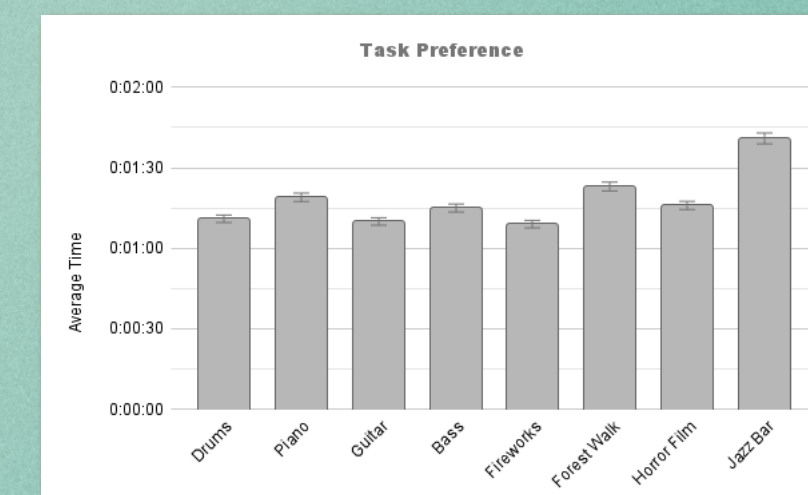
Refinements, especially in the areas of multi-track interaction, altering single sensor trigger modes, and enhance sensor stability are essential. Exploring its use in therapeutic and educational settings presents promising avenues.

Test & Evaluation

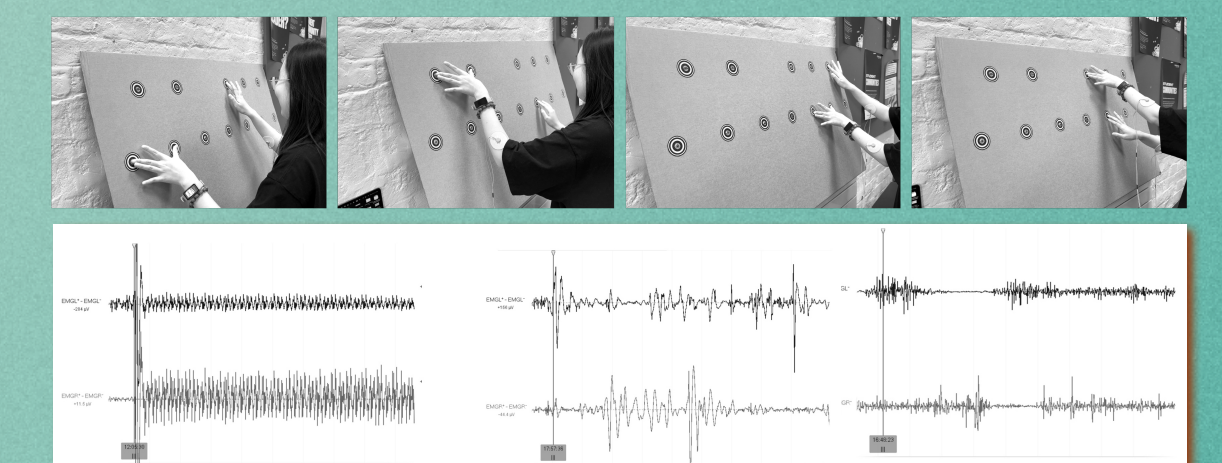
Interaction Pattern Discover



Music Attribute Analysis



8 participants of diverse musical backgrounds tested the "BodyGroove" project, interacting with eight sound tasks in a controlled classroom. The results indicated positive and spontaneous body-music coordination by testers, influenced by different musical properties.



Feedback Gathering

Facets	
Engagement	Randomness, not found in the market, use tool to strike, unpredictability, multi-tracks, unknown preset, remix, touch-free
Learning Curve	Low entry barrier, memory issue, sensor sensitivity, Wire contact, steps of instruction straightforward, light sensitive
Sound quality & Diversity	High quality, two-hand interaction, satisfied arrangement, consistence, other body part, overlapping, chaotic combination
Application & Use Cases	Gathering, Party, used by Children, children education, art gallery, interactive wall, disabled, music demo,
Improvements	Trim sound, sensitivity, sustained sound emission, light indication, sound extraction, physical distance