Motion Reactive Sound Generation System for Immersive CAVE Environment

A Design Perspective

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Giovanni Barone is a junior designer recently graduated at Politecnico di Milano. Now he is studying Integrated Product Design Master Study, wanting to pursue a career in scientific research. His aim is to converge his design professional skill and his competence in electronic Music, with the purpose to create different kind of experience.
1 Introduction
In recent years, to increase the degree of immersiveness of an experience, **technologies are employed** and integrated that allow the user to go beyond what is tangible and visible in physical reality, adding **additional layers of perception**.
1.2 Methodology

- Literature review
- Case study analysis
- Model theorization
2 Immersive experience
**Immersivity** is a phenomenon that can be experienced when an individual is in a **state of deep mental involvement**.


Therefore, **immersive experience** can be defined as the **perception of being a part of a different environment** than our normal day to day.
CAVE systems are **AV environments** where the user's experience takes place within walls, on which a **virtual world is projected**, equipped with a **motion tracking system** that becomes an intermediary between the virtual world and reality.

_M.A. Muhanna. Virtual reality and the CAVE: Taxonomy, interaction challenges and research directions (2015)._
These systems enable **authentic interaction between the user and the virtual world**, creating, for example, dynamic and responsive scenarios influenced by the user's movements.
By **audio reactivity** it is mostly meant the whole world that has to do with **visual elements that are generated or changed to the rhythm of music**.

3.2 Examples and applications

Audio reactive installation by Quadrature

Techno shamanic vision by Jon Weinel
4
MRSG system
What is it?

MRSG System for Immersive CAVE Environment

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Starting from audio reactive systems and their operative functions, the aim is to hypothesize a change in the process of application of such technologies: if in the field of VJing music is an input to create visualizations, through the hypothesized system the **scope is to create music using visual sources**, and to be precise cameras that integrates motion capture technology to control sound generating machines through the MIDI communication system.
5 Discussion
Further steps and future development

5.1

- **Testing**
  (understand the limitations and peculiarities)

- **Prototype**
  (interaction between audio and video)

- **Integration Model**
  (make possible system’s replication)
The application of these technologies and systems to immersive environments can **enhance the level of multisensory and cognitive immersion**.

For sure, the main issue and **challenge** is going to be encountered during the development stage of the project, when the **different hardware should be linked to each other through to exploitation of ad-hoc software**.
Thank you for the attention

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