Immersive Gaming through Mobile Applications and Volumetric Cubes

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L3D Cube – Volumetric and Tangible Display

The L3D cube, developed by LookingGlassFactory, is both a volumetric and tangible display. It is a three-dimensional cube of LEDs (Light-Emitting-Diodes) that is 8x8x8 and can be viewed from almost all sides. It has been described as a "simple hologram," as a hologram is a light field used to display three-dimensional visuals.

L3D Cube:

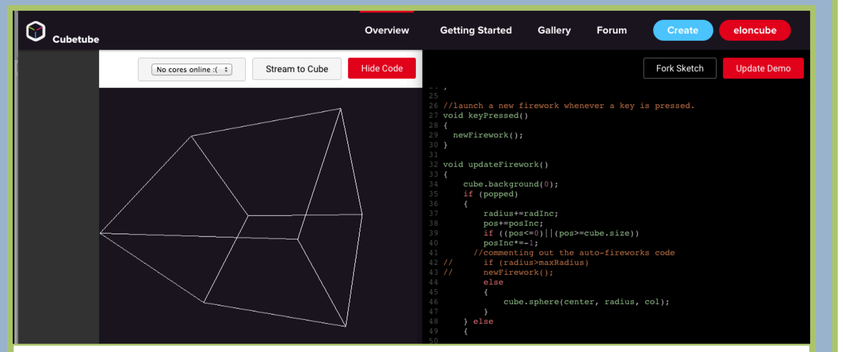
- Housed in a glass case and made up of 512 individual lights
- Also a tangible display because the user can touch it and interact with it.
- Equipped with an accelerometer (a device that tracks the tilt and motion of the cube) and a microphone, allowing the user to interact with it physically [6].

The cube is an example of advancements in human-computer-interaction, providing a three-dimensional interface that allows the user to touch it to interact with it. It represents both a volumetric and a tangible display, giving it the ability to enhance user experience greatly. Used in conjunction with some sort of controller, the cube has the potential to lead to an extremely immersive experience that offers a new and unique way to interact with technology.

Gaming and Technology – Why It Matters

Progress in the videogame world leads to advancements in technological communication – from the user to the hardware to the program. "For the first time, these games have allowed players to immerse into a virtual game world, where the effects of the game actions were only limited by the imagination of the programmers. When computers became more powerful, rich audio and visual presentations as well as more complex simulations enhanced the gaming experiences and turned the computer games industry into a mass market. Today, computer games have even become an innovating force that causes rapid advancements in other technological areas such as computer graphics and network technologies." [1]

Advances in hardware lead to a more seamless human-computer-interaction (HCI), where humans are fully immersed in the games and getting the fullest experience the developers would like to engender. Programs must then be developed and changed based on this hardware, allowing all of the technologies to communicate together.



L3D Cube Programming on cubetube.org

Primary Research Question:

Is it possible to build an immersive gaming experience using some combination of a handheld device and a volumetric display?

Important Concepts and Technology

Volumetric displays are graphical displays that emulate visuals in three dimensions, providing a unique opportunity to expand user interfaces [4]. Volumetric displays are important in the advancement of human-computer-interaction, as it takes visuals from a two-dimensional space to a three-dimensional space. This allows for many different possibilities for user interfaces (the way a user interacts with a technology).

Tangible displays:

- Displays that the user can touch and interact with
- Exist on a physical level rather than only a visual level
- Most two-dimensional displays are confined to visual

The goal of these tangible interfaces is to connect the digital world with the physical, exemplified in emerging technologies such as interactive rooms, digitally enhanced white-boards, and computer augmented environments [2]. To convey truly immersive virtual experiences, the virtual domain must also exist in a space outside the computer and the physical domain must portray real world properties and incorporate tangible interfaces [1].

References

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