Project Proposal: Ubiquitous Accessible Home

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ABSTRACT

Ubiquitous Accessible Home aims to provide an intelligent household that understands your voice command, gestures, and eye movements to open the door, turn down the heating or air-conditioning, change the lighting, start a vacuum, fill-up a bathtub, and more! This smart system will expand your control, seamlessly integrate your voice and motion commands with your house, making it smarter, cozier, and more efficient.

Author Keywords

Smart Home, Accessibility, Microsoft Kinect2, Google Glass, Eye-tracker

TECHNOLOGY

We would like to utilize Microsoft Kinect2, Google Glass, and an eye-tracker to analyze user gestures, voice commands, and eye movements, respectively, to provide control over a household's various sub-systems. Microsoft Kinect2 provides quality motion tracking with a significant number of articulation points that can be tracked. By focusing those points on certain specific body parts, we can utilize detailed information about the user's poses and gestures and translate user's sign language[1]. By introducing various categorical custom voice commands to Google Glass command system, we can create a contextual interaction ability to the device. Ultimately, this would aid users to control different house sub-systems efficiently. Finally, through an eye-movement tracking and control interface, users without the voice control ability can significantly benefit.

On top of the multi-modal command system, we would like to provide a control hub equipped with an API that collects different types of input and turns it into an easily usable data stream for smart home systems such as Alphabet's Nest.

APPLICATION DOMAIN

The domain that we are aiming to serve with this project is the smart home industry. One of the main hopes for ubiquitous computing is increasing the ease of interaction that we have with our everyday technologies. By considering different user cases and incorporating them into the user interface, we hope to create a smart home that is accessible to a wider range of people.

IMPACT

By providing alternative methods for interacting with your home (and office) we increase the ease of living for a variety of users. Moreover, users who may not be able to utilize one or another form of control interface can have other options, which will increase user accessibility to the house control system. Finally, providing a control interface equipped with an API for different modes of input will facilitate smart home appliance manufacturers' efforts to accommodate their products' usability to a more diverse range of users.

REFERENCES

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