

Briefing Note – Experiment Using Kinect to Control PowerPoint Slides

Executive Summary

Gesture-controlled technology allows users to engage in virtual activities with motion and movements similar to what they would use in the real world to manipulate content intuitively. The idea that simple gestures can be used to control computers is opening the way to a host of input devices that look and feel very different from the keyboard and mouse — and that are increasingly enabling our devices to infer meaning from the movements and gestures we make. Voice control is used to control devices by means of the human voice.

MS Kinect allows computers to recognise and interpret voice and natural physical gestures as a means of control. It is dramatically changing the way in which people interact with computers. In our experiment, we look at the potential value of using Kinect in the lecture room to deliver PowerPoint presentations. We test its feasibility and reliability to control MS PowerPoint slides using voice and gesture control.

Experiment Overview

For our experiment we have used Kinect XBOX 360, a sensor with built-in software that can capture, track and decipher body movements, gesture and voice. We have also used the Kinect SDK v1.5 which supports applications built with C++, C#, or Visual Basic using Microsoft Visual Studio 2010 or 2012.

We focused on the use of Kinect to control PowerPoint slides through gesture control and voice control.

- In the gesture-controlled experiment, the main features tested were the skeleton detection and the swiping hand movement to control slides. Although we succeeded in making these features work, there are issues outstanding regarding user interface development, user detection distance and user subject identification. There is also a space limitation as gesture control requires enough empty space between sensor, user and screen which might be difficult to find in some lecture theatres.
- The voice-controlled experiment proved more positive in the sense that it didn't have space limitations associated with gesture-control. It was relatively straight forwards to train the system to recognise the keywords used to navigate through the slides backwards and forwards. However its accuracy may be greatly reduced in a noisy environment. Main user voice recognition may help to address this issue.

Recommendations

The use of voice or gesture controlled technology such as Kinect has potential as a new, engaging way of delivering presentations. However, it still needs substantial amounts of testing and development to achieve a robust, reliable product. It also requires a fair amount of user training. Besides, to add value to the classroom experience we would recommend building extra features beyond the slide navigation function such as zooming or pointer functions and an improved interface.

- As a teaching tool, Kinect is flexible and versatile. The lecturer can interact with contents via body movements, gesture and voice. Kinect can support various teaching activities. Special instructional design can be implemented to reinforce the connection between teaching contents and student physical responses. For instance, when students see a clue, they need to act out in order to proceed. If designed properly, the interactive contents can greatly engage students.
- As a learning tool, Kinect can be used to create interesting interactions to boost student motivation. Kinect can be used with software programs to enhance its role as a learning tool. For example, students can utilize the information gathered by Kinect with software programs to create highly interactive multimedia works.
- Priced just over one hundred pounds, Kinect XBOX 360 has potential as an affordable add-on tool for Higher Education
- Although Kinect has potential to add value as a tool for teaching and learning, further investigation is needed around improving algorithm precision, creating a user friendly interface and adding extra functionality.

Further Information

If you have any questions or comments regarding this product, please contact IT Services.