Name(s)

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Project Number

S0913

Project Title

The Minicomputer/Projector: An All-In-One Mobile Solution for an Interactive "Touch Screen" Interface on Any Surface

Abstract

Objectives/Goals

This experiment was conducted for the purpose of answering the following question: Can a computer be combined with a projector and infrared cameras to create a pocket-sized device capable of providing an interactive computer interface on any surface?

Methods/Materials

A Pico-ITX embedded motherboard was combined with an RGB laser based pocket projector. Dual infrared texture-mapped depth imaging sensors and an accelerometer were integrated to allow for object tracking and auto-calibration. Microsoft Windows 7 OS was installed. Software was written and hardware was modified to network components and enable inter-communication. The device was powered via a modified 5V AC/DC power adapter or eight 1.2v AA NiMH batteries. RCA connectors were used as a power transfer medium.

Results

The device was successful in responded in real-time to physical user input and computationally intensive applications. The prototype unit effectively communicated with the necessary components and a useful product was produced.

Conclusions/Discussion

The computer/projector design was successful as a practical solution for a cost effective, energy efficient mobile device. By creating a small portable unit with large screen size capability, users are no longer restricted to a fixed "Smart board" location. This concept would benefit numerous industries as well as have potential educational and military applications due to its small size and effectiveness on multiple surfaces. Ultimately my goal is to enhance the device capabilities to track objects beyond the X and Y axis, and incorporate the Z axis.

Summary Statement

A computer was combined with a projector to create a pocket sized solution that projects an interactive touch screen interface onto any surface.

Help Received

No Help.