ITSP Project Abstract

Team Name: 3D Thrills

Introduction:

The idea is to build an easier and cooler interface between user and computer. In its first stage we'll be making a virtual input board that recognizes touches or patterns traced by a stylus (not necessarily fingers) and interact with the computer giving in inputs as it touches the surface on which the board is spread.

Construction:

It would consist of a IR laser diode that shoots out a thin plane of IR light. A CMOS that detects where you cut the IR plane. A Virtual Interface Processing Core, which is a sensor chip that determines the position of the stylus. A projected image of a keyboard to make it look better can be attached, which consists of a visible laser diode and an image of the keyboard to be projected(short-cut could be just paint a keyboard on the surface). A microcontroller to process the info.

Brief working:

The IR laser diode creates a sheet on any surface, just millimeters above it. Whenever we make a gesture of pressing a key(just tapping on the surface), it would result in cutting the IR plane at that point which can be analyzed using a CMOS (functioning needs to be studied). Another sensor chip called the Virtual Interface Processing Core images your finger position by making a real-time determination of reflected light.

To process this info and feed it to a computer, we need a microcontroller (Arduino or equivalent), and feed it to a computer. Input can be given in the form of USB or Bluetooth (whichever gives results better).

For creating a sophisticated overview, we can project an image of a keyboard on the surface by a regular diode laser (like the ones used in pointers), with a Diffraction Optical Element, something that projects the image of whatever we wish (research about it's construction pending) which gives a feel of a high tech gadget.

The projector, the CMOS and VIPC, along with the IR laser diode can be mounted on a stand to make it compact and portable.

Found some resources on the net about it's working and construction.

Estimated Timeline:

Week 1 & 2:

Research and study about the project. Learning of image processing and other useful

project related softwares.

Week 3:

Hardware designing

Week 4:

Coding related work

Week 5 & 6:

Testing & debugging of our project

COMPONENTS REQUIRED:

CMOS sensor

VPIC

IR laser Diode:

Image Projector

DOE

Microcontroller

Power Source

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