Asian Journal of Engineering and Technology Innovation 03 (06) 2015 (36-38)

Asian Journal of Engineering and Technology Innovation

ISSN : 2347-7385

REVIEW ARTICLE

Received on: 18-03-2014
Accepted on: 28-03-2015
Published on: 02-04-2015

Bhavya Shetty, Rachana Gowda, Jyoti Sanap, Ashish Manwatkar
Computer Engineering Department, Indira college of engineering and Management Pune University, Maharashtra, India
bhavyashetty2309@gmail.com
Rachanagowda2194@gamil.com
jyoti.sanap33@gmail.com

QR Code for Mobile users

Conflict of Interest: None Declared

Interactive Projector

Bhavya Shetty, Rachana Gowda, Jyoti Sanap, Ashish Manwatkar
Indira College of Engineering Pune.

ABSTRACT

Laser pointer based interfaces present an interesting alternative for interaction with large displays. In order to operate correctly, such systems need to reliably and quickly detect the on-screen laser spot generated by the pointer. This paper describes an algorithm for real-time laser spot tracking and presents performance results. Large displays are increasingly present for everyday use, at work or at home. Interacting with these displays requires different form of control than for a classical desktop computer, since both keyboard and mouse require a horizontal surface to work. The alternatives for interaction are therefore light/electronic pens, touch sensitive panel, laser pointers or some other kind of wireless handheld input devices (WHID), as well as speech and gesture recognition systems. Video projectors are quickly growing in popularity, given their increasing affordability, ease-of-use and flexibility, providing graphical interface on the projector screen. User can draw on the projector without using any hardware. It introduce an easy solution for drawing on projector, to make an interactive projector on flat surface wall, so that presenter can add more value to presentation material and understanding of attendees, laser beam detection, drawing on laptop, user will be able to change the marker color.

Keywords: Human-computer interaction, laser pointer, system performance, computer vision.

Cite this article as:
Bhavya Shetty, Rachana Gowda, Jyoti Sanap, Ashish Manwatkar. Interactive Projector. Asian Journal of Engineering and Technology Innovation 03 (06); 2015; 36-38.

INTRODUCTION

To make an interactive projector on flat surface wall, so that presenter can add more value to presentation material and understanding of attendees. Finger tip tracking, drawing on laptop (that is connected to projector),user will be able to change the marker color, user will be able to perform operations like zoom out and zoom in.

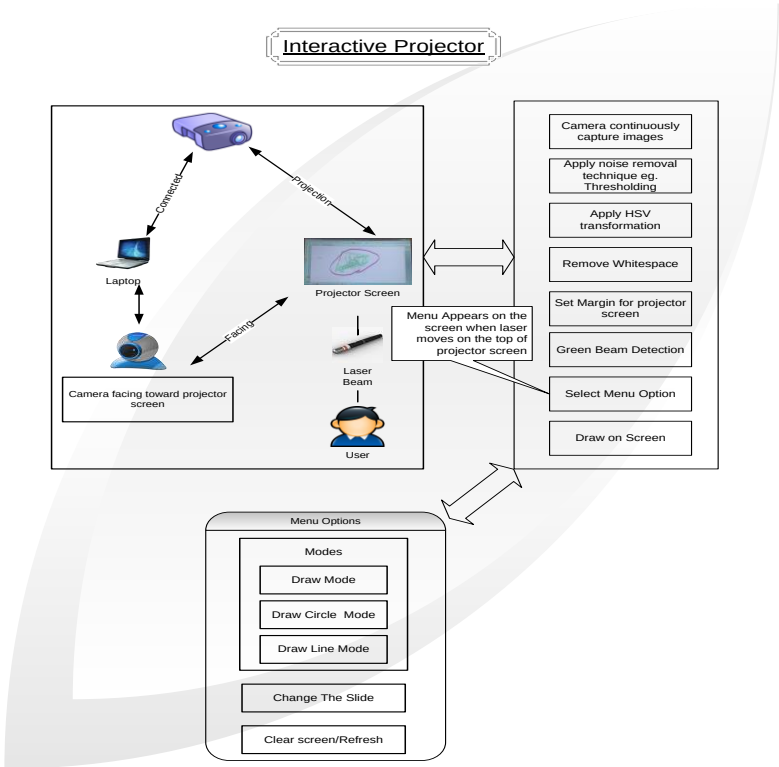
The basic idea is simple, in which a program running on the PC will process the images viewed from the webcam, find the position of the laser pointer, and use the position to determine where to place the mouse cursor on the screen. Now, if we can assume that the laser point is always the brightest object in that area, than the detection algorithm will be very simple to find the location of pixel with the highest intensity level. We use two additional useful facts:

1. Normal pocket touch lights (or any incandescent lamp for that matter) actually emits several times more infrared light than visible light and therefore works better as IR point source than a visible light source.
2. Most webcam are able not only to detect visible lights (red, green and blue, etc) but they can also detect infrared (IR) lights – for example as emitted by the IR LEDs commonly found on TV/Hifi remote controls – which are invisible to the human eyes. So we can somehow use the webcam to capture only the infrared lights from our light source and reject the surrounding visible lights, we will be guaranteed of a very reliable system.

SCOPE:

User will be able to draw on the projector without using any hardware. It introduce an easy solution for drawing on projector, to make an interactive projector on flat surface wall, so that presenter can add more value to presentation material and understanding of attendees, laser beam detection, drawing on laptop(that is connected to projector), user will be able to change the marker color.

PROPOSED SYSTEM:



The architecture shows that a program running on the PC will process the images viewed from the webcam, find the position of the laser beam and use this position to determine where to place the mouse cursor on the screen. Now we can assume that the laser beam is always the brightest object in the area. We make an interactive projector on flat surface wall, so that presenter can add more value to presentation material and understanding of attendees. We can make various operations such as drawing on projector screen (that is connected to projector), change the marker color, zoom out and zoom in, change the slides.

RELATED WORK DONE:

The paper [1], proposed laser pointer interfaces provides an interaction with large displays such as those provided by video projection systems. Laser pointer interfaces, on the other hand, offer an interesting alternative for close interaction with large displays such as those provided by video projection systems. It presents a fast laser spot detection method that can be used for real-time laser pointer interaction on computer.

In paper [2], author proposed the gesture-based computer control system coupled with the dedicated touch less interactive whiteboard is presented. A vision-based gesture recognition system which employs a camera and a projector, both placed behind the user, is first presented. Then the concept of using fuzzy logic for reliable gesture recognition is proposed. It presents the Interactive Whiteboard application engineered to demonstrate possibilities of the developed interface. Especially fuzzy logic-based recognition systems are of the main interest of the authors, since the fuzzy rule-based approach to gesture recognition is proposed.

In paper[3], author proposes the idea is to use a WiiMote (which is a component of the popular Nintendo videogame technology called Wii) to reproduce the functionality of an interactive whiteboard. This controller is a very interesting piece of hardware containing an infrared camera, Bluetooth connection, several pushbuttons and also a gyroscope. The Wiimote is put in a fixed position so that its infrared camera can "see" the projected computer screen. The user holds a pen-like device that has an infrared light. The Wiimote detects and communicates (via Bluetooth) the position of the infrared light to the computer, the screen of which is projected.

In paper [4], author presented an idea is to use a WiiMote (which is a component of the popular Nintendo videogame technology called Wii) to reproduce the functionality of an interactive whiteboard. This controller is a very interesting piece of hardware containing an infrared camera, Bluetooth connection, several pushbuttons and also a gyroscope. The Wiimote is put in a fixed position so that its infrared camera can "see" the projected computer screen. The user holds a pen-like device that has an infrared light. The Wiimote detects and communicates (via Bluetooth) the position of the infrared light to the computer, the screen of which is projected.

In paper [5], author proposes a direct interaction with a video projection screen using a laser pointer is proposed. The laser point on the screen is captured by video camera, and the location is recognized by image processing techniques. The behavior of the point is translated into signals sent to the mouse input of the computer causing the same reactions as if they came from the mouse. More complex interaction paradigms are composed from the elementary operations" switch on/ off" and pointing of the laser pen.

In paper [6], author proposes a low-cost efficient Interactive Whiteboard that, by fusing depth and video information provided by a low-cost depth camera, is able to detect and track user movements. It also allows to integrate gesture recognition, hence, to broaden the user-whiteboard interaction possibilities. The system is initialized with video and depth data to correctly identify the area in the images where the whiteboard is situated. The Mixture of Gaussians background modeling algorithm is employed to obtain a reliable estimation of the whiteboard depth map and color model.

In paper [7], author presents a low- cost interactive whiteboard by positioning the infrared LED pen with particular sign accurately by analyzing depth and IR data of Kinect. It is combined with CUDA platform and OpenCV Library to speed-up image process and obtain high real-time performance. This low- cost interactive whiteboard Projector using the Kinect can be used in a various settings, like classrooms for education, in work groups and corporate board rooms, in broadcasting studios, in training rooms for professional sports coaching, and many others.

CONCLUSION:

The system proposed is a basis for an interface between humans and machines using a spot-light from a laser pointer, a camera, and a projector. This proposed system has obtained the stable conditions of spot-light detection, various lighting environments is the critical factor in the edge detection step, the adaptive threshold mechanism in detecting the edges that was applied in this system is the other advantage. Although the current system can result the coordinate of laser spot-light in screen distortion, we are working to improve this system's ability to calibrate for another kind of direction screen distortion, implementation on a single PC, and implement the system to give commands to a specific machine.

REFERENCES

1. On-Screen Laser Spot Detection for Large Display Interaction Jean-François Lapointe and Guy Godin, October 2005.
2. Gesture-based Computer Control System applied to the Interactive Whiteboard, Michal Lech, Bozena Kostek, June 2010.
3. Interactive whiteboards based on the WiiMote: validation on the field, Massimo Bosetti, Pietro Pilolli, Matteo Ruffoni and Marco Ronchetti, September 2011.
4. Interaction with a Projection Screen Using a Camera-Tracked Laser Pointer ,Carsten Kirstein, Heinrich M¨uller 2011.
5. Low-Cost Efficient Interactive Whiteboard Massimo Camplani, Luis Salgado and Romolo Camplani, 2012.
6. Low-Cost Interactive Whiteboard Using the Kinect Shuai Zhang, Wenrui He, Qiao Yu, and Xiaojuan Zheng 2012.
7. Interaction Using the Projector Screen and Spot-light from a Laser Pointer: Handling Some Fundamentals Requirements Romy Budhi Widodo, Weijen Chen and Takafumi Matsumaru 2012.