iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** III **Month of publication:** March 2018

DOI: http://doi.org/10.22214/ijraset.2018.3062

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue III, March 2018- Available at www.ijraset.com

Laser Controlled Desktop

Nikhil Lohar[1], Manisha Moku[2], Humzah Shaikh [3], Prof. Chhaya Narvekar [4]
[1, 2, 3]*Information Technology, Xavier Institute of Engineering, Mumbai, India*

Abstract: With the advancement of technology devices are becoming affordable to general people and people are more attracted towards Artificial Intelligence and new ways to interact with computer devices. This work presents a technique for a human computer interface through laser gesture recognition. This system can be used for interfacing between computer and human using a laser gesture. This application detects the laser point stroke on any flat surface. Here we can make any flat surface such as wall or book as virtual events and a press of laser light acts as key press on keyboard. This application uses webcam to monitor the segmentation area, detects if any laser light comes to any segment and then does the equivalent of pressing a specified keyboard key. This work proposes an alternative computer control method based upon a standard laser pointer, used to control applications and recognize specific contextual gestures at a significant stand-off distance. The objective of this project is to develop an interface for recognition of laser gestures with reasonable accuracy.
Keywords: Laser Pointer, Camera, Projector, Colour Detection Algorithm.

I. INTRODUCTION

Computer is used by many people either at their work or in their spare-time. Special input and output devices have been designed over the years with the purpose of easing the communication between computers and humans, the two most known are the keyboard and mouse. Every new device can be seen as an attempt to make the computer more intelligent and making humans able to perform communication with the computer.

This has been possible due to the result-oriented efforts made by computer professionals for creating successful human computer interfaces. The computer programmers have been incredibly successful in easing the communication between computers and human.

With the emergence of every new product in the market; it attempts to ease the complexity of jobs performed. The idea is to make computers understand human language and develop a user friendly human computer interfaces (HCI). Human computing interaction (HCI) is one of the important area of research where people try to improve the computer technology [8].

Nowadays technology has been improved with the help of smaller and smaller devices. This application monitors any flat surface for the presence of a small spot using a webcam. When the spot appears inside a defined range, the appropriate command or keystroke [4] is executed. This application uses a webcam that detects when a laser pointer is in a specified range of the flat surface and then does the equivalent of pressing a specified keyboard key. Thus, we can control applications using laser ray. The range can be set by the user as well as the actions performed. We can make our laser as a remote control.

II. SYSTEM ANALYSIS

A. Existing System

In existing framework individuals utilize computers to perform an operation. At mechanically progressed places there are systems such as Laser Consoles but fundamental disadvantages here is that such frameworks are exceptionally costly for common individuals to use [7]. The right now created framework based on Laser Pointer is network based which makes the framework confined to perform as it were constrained [2].

B. Proposed System

We propose a system where remotely a person could be able to access the computer. To make the system affordable to general public we would make use of low price webcam and a laser point to for operation. Our system would be capable to map any flat surface as virtual keypad and translate laser stoke as key press [2]. A camera is used to record the location of the laser pattern, and then the laser pattern is detected. Once a pattern has been detected its trace is recorded spatially until the laser pointer is switched off. According to laser pattern, the application will be communicated with the system, and the system will perform some operation regarding the pattern.

C. Colour Detection Algorithm

There are various approaches for Colour Detection in a continuous image stream. Every part of them are based on comparing of the current image frame with one from the previous frames. To perform Colour detection our system uses OpenCV Framework. Here the Colour detection algorithm helps our system to be aware of the direction the laser gesture is been made. The four main directions i.e. Left, Right, Bottom and Top will be assigned to an adjacent operation which will be applied to the running System Based Application. The working of the algorithm is based on the time frame of 1000ms. After every 1000ms the system compares the current frame with the previous frame from start of the laser gesture to end of it. Thus, recognizing the direction, the application shows the result based on the pattern. OpenCV Framework provides with libraries that are required and are suitable to make the operation performance successful in real time.

Some basic commands:

1) *Create a window:* cv Named Window("Color", CV_WINDOW_AUTOSIZE);
2) *Load an image*: Ipl Image* img; img=cvLoad Image (fileName);
3) *Display an image:* cv Show Image("Color",img);
4) *Close a window*: cv Destroy Window("Color");

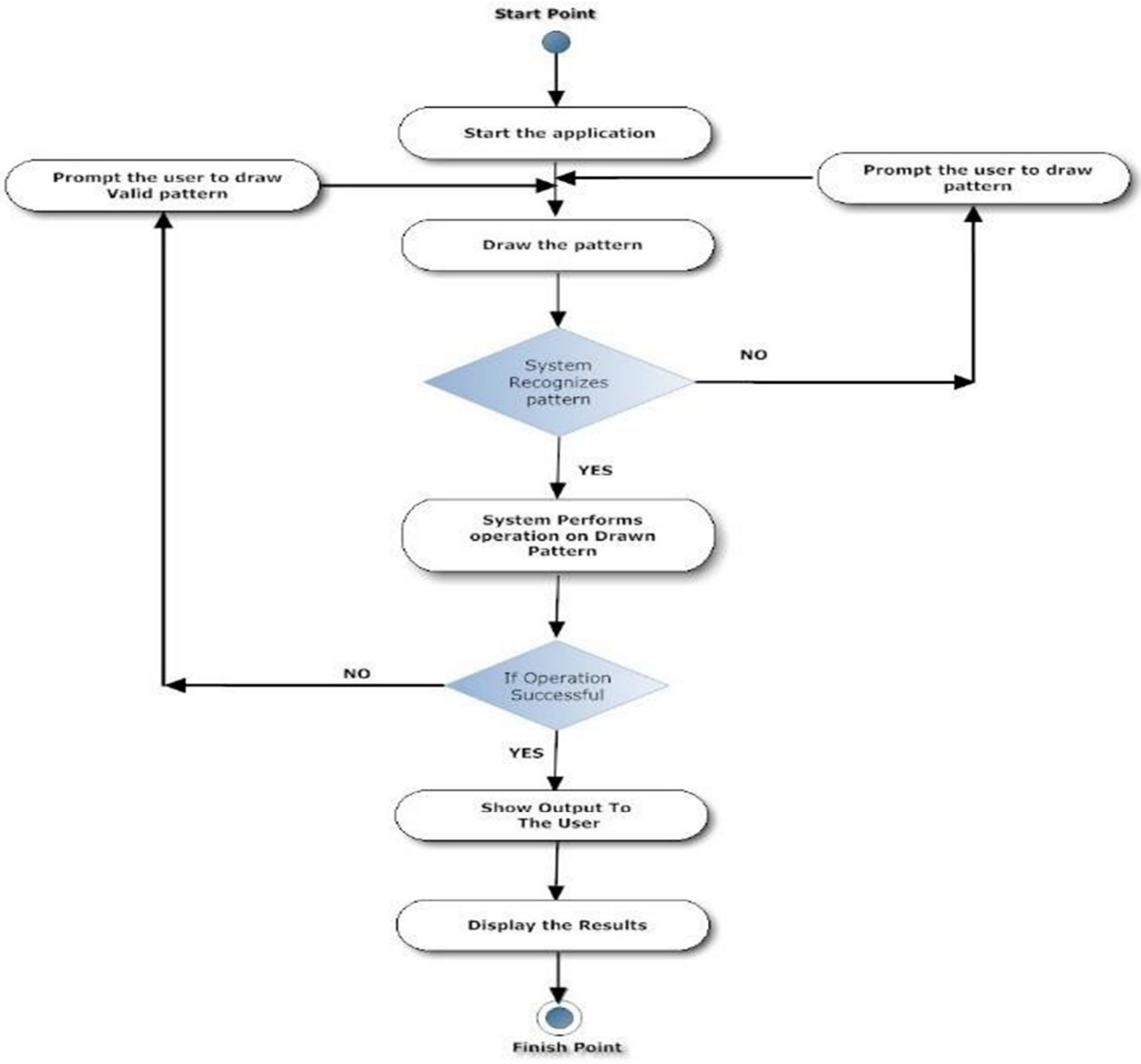


Fig 1. Flow Chart

III. METHODOLOGY

A. User Module

1) The user runs the application

2) The user does the laser gesture on Selected Area in web camera's range.

B. Webcam Module

1) The webcam will detect the pattern and send to the application.

2) Our application does live capturing of the ongoing video and display it in the application frame.

3) We can set the attributes for the camera and resolution settings or it would take directly from the video Properties file.

C. Laser Point Identifier

1) Here a fixed camera captures a scene which is analysed as frames.

2) Every time next frame gets compared with the previous frame for the changes.

3) In this module we write program for pixel colour change detection in frames.

4) Here we analyse the base frame pixel colours and match with the next frame pixels.

5) Because of the brightness of laser point it gets detect by our application.

D. Application Module

1) The application will detect the pattern.

2) After the detection of the pattern, some operations are performed on system.

3) The operations like handling the system installed applications.

IV. IMPLEMENTATION

Our framework employed inside the camera of the tablet or an external webcam to screen the chosen region. The Camera identifies if any laser light comes to any portion and captures the frame through any portion and captures the frame and through movement location distinguishes the heading in real time and performs the assigned work. The framework in .NET utilizes a webcam that recognizes when a laser pointer is in a defined range and at that point does the equivalent of squeezing a indicated console key[2]. In this way we can control system applications. The range can be set by the user as well as the action performed. We can make our laser as a remote control.

The User will start the application and then the Web Camera connects with the GUI which would be running on our colour detection algorithm from which the Laser point gesture is recognized [5]. Now the frame capturing is initialized and from the start point of the laser light till the end point where the laser pointer is switched off the direction of the gesture is known in real time. The Background and then the colour of the Laser is detected and separated from other light rays [6]. Thus, the pattern of the Laser Gesture is matched and the action on the application is performed.

Table 1
Function of Gestures

Sr. No	Gestures	Function
1.		Presentation Control : Next
2.		Presentation Control Previous
3.		Media Player : Volume up
4.		Media Player : Volume Down

5.		Media Player : Play
6.		Media Player : Pause

V. CONCLUSION

The application uses webcam to monitor the segmentation area, detects if any laser light comes to any segment and then does the equivalent of pressing a specified keyboard key. Here to interact we use a webcam detects when a laser pointer is in specified hotspot and then does the equivalent of pressing a specified keyboard key [2]. we can control various application installed in our system. The hotspot can be set by the user as well as the action taken. We can make our well as remote control.

REFERENCES

[1] M. S. Brown and W. K. H. Wong, "Laser pointer interaction for camera registered multiprojector displays," IEEE Conference on September 2003, pp. I-913-16 vol.1.

[2] Manjunatha V and Prasanna Kumar M's "Laser Powered Virtual Events", IJARCSSE 2013, January - 2013, pp. 323-326

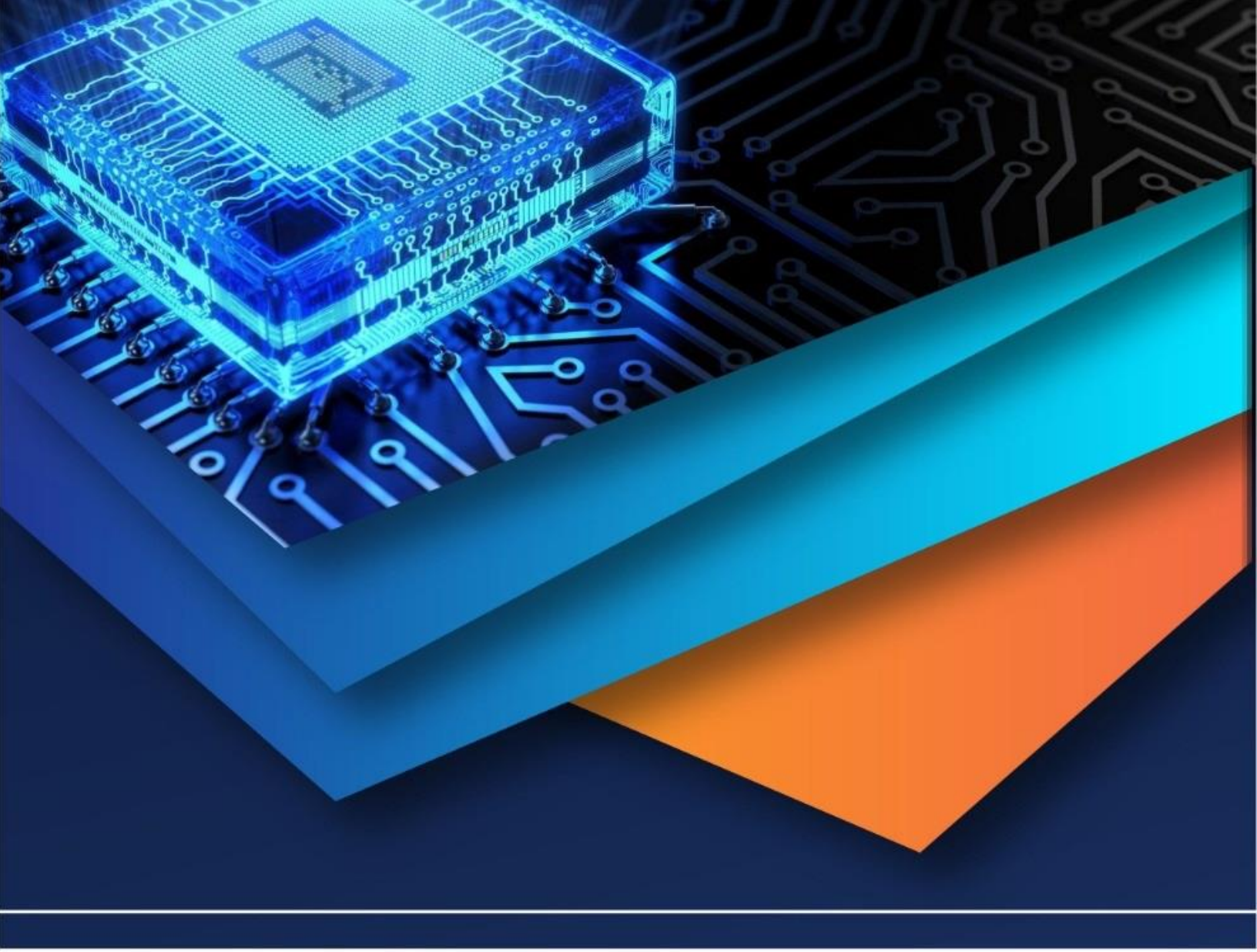
[3] Atul Chowdhary, Vivek Agrawal, Subhajit Karmakar, Sandip Sarkar "Laser Actuated Presentation System", November - 2009

[4] Zeenat AlKassim's Virtual Laser Keyboards: A Giant Leap Towards Human- Computer Interaction, IEEE 2013.

[5] Eshed Ohn-Bar and Mohan Manubhai Trivedi, "Hand Gesture Recognition in Real-Time for Automotive Interfaces", IEEE Transactions on Intelligent Transportation Systems 15 (6), 2368-2377, 2014.

[6] Ana Carla de Carvalho Correia, Leonardo Cunha de Miranda, Heiko Hornung, "Gesture-based interaction in domotic environments", 2011. [7] TED India 2009. "Pranav Mistry: The thrilling potential of Sixth Sense technology".Available: http://www.ted.com/talks/lang/en/pranav _mistry_the_thrilling_potential_of_sixthsense_technology.html

[8] Radhika Bhatt, Nikita Fernandes, Archana Dhage " Vision Based Hand Gesture Recognition for Human Computer Interaction "International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 3, May 2013.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY