Software Requirements Specification

For

Virtual Mouse

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1. Introduction

1.1 Purpose

Our project Virtual Mouse is a concept device similar to a virtual keyboard, allowing usage of a computer with a minimal amount of interactive physical peripherals.
With this idea we aim to provide every student's and employ's use virtual mouse because we were see many students and employ's not interested in use of keyboard mouse so we are decided why not use for virtual mouse. A computer technology continues to develop and people use of smaller and smaller electronic device cause smaller device use to easy and suitable to every person. It is real time application. This project remove the various external part like physical mouse and keyboard mouse.

1.2 Intended Audience and Reading Suggestions

The intended audience of this document is the potential end user. The document also serve as a reference guide to the developers of the systems.

1.3 Product Scope

This project has a lot of scope in the future development. Developing virtual mouse system promotes easy to use rather than use keyboard mouse.

In the future, we plan to add more features such as enlarging and shrinking windows, closing window, etc. by using the palm and multiple fingers

1.4 References

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2. Overall Description

2.1 Product Perspective

A computer mouse is a hand-held pointing device that detects two-dimensional motion relative to a surface. This motion is typically translated into the motion of a pointer on a display which allows a smooth control of the graphical user interface.

Our project Virtual Mouse is a concept device similar to a virtual keyboard, allowing usage of a computer with a minimal amount of interactive physical peripherals.

2.2 Product Functions

Now a day's intelligent machine which can be used along with the computer are being developed, which helps in friendly Human Computer Interaction (HCI). In the recent years different technologies are used for developing the virtual mouse. In this project, we have tried to provide a review on different technologies for the virtual mouse. To work with a computer mouse and Keyboard are the very essential input devices. To solve this problem virtual keyboard and mouse is developed.
Creating a virtual human computer interaction device such as mouse or keyboard using a webcam and computer vision techniques can be an alternative way for the touch screen. In this study, finger tracking based a virtual mouse application has been designed and implemented using a regular webcam. The motivation was to create an object tracking application to interact with the computer, and develop a virtual human computer interaction device.

In this study, a color pointer has been used for the object recognition and tracking. Left and the right click events of the mouse have been achieved by detecting the number of pointers on the image.

2.3 User Classes and Characteristics

The proposed system makes use of the webcam for tracking the user's hand and to recognize the gestures for the purpose of interaction with the system. The threshold boundary is introduced for faster detection of hand and recognition of gestures. Mouse

activities are done by recognizing the gestures. The work will be extended for real time tracking and additional mouse activities. To solve the problems, a system can be used called Gesture Recognition System. A primary goal of this gesture recognition is to create a system which can identify specific human gestures and use them to convey information to control traffic signals as per traffic controller's wish and also for controlling the mouse.

2.4 Operating Environment

Generally for personal use in computers and laptops we use a physical mouse or touchpad's invented a long time ago and in this project requirement for external hardware is completely eliminated by using human computer interaction technology we detect hand movements and gestures for mouse movements and mouse events.

2.5 Design and Implementation Constraints

Evan though the system enable virtual mouse from any terminal connected to the internet. A high speed internet connection is needed as an interface between the service provider and user.

2.6 User Documentation

we will need these variables and objects, mouse object is for mouse movements and to get the screen resolution we need an **wx** app then we can use the wx.GetDisplaySize() to get the screen resolution.

lastly we are setting some variables **camx**, **camy** to set the captured image resolution. we will be using it later in image resize function

2.7 Assumptions and Dependencies

we aim to provide every student's and employ's use virtual mouse because we were see many students and employ's not interested in use of keyboard mouse so we are decided why not use for virtual mouse. A computer technology continues to develop and people use of smaller and smaller electronic device cause smaller device use to easy and suitable to every person. It is real time application. This project remove the various external part like physical mouse and keyboard mouse. It is based on machine learning and python language.

3. External Interface Requirements

3.1 User Interfaces

Creating a virtual human computer interaction device such as mouse or keyboard using a webcam and computer vision techniques can be an alternative way for the touch screen. In this study, finger tracking based a virtual mouse application has been designed and implemented using a regular webcam. The motivation was to create an object tracking application to interact with the computer, and develop a virtual human computer interaction device.

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3.1 Hardware Interfaces

We are remove to hardware system with helping to virtual mouse after than reduce of cost hardware system and easy to use rather than keyboard mouse. No need to external parts after than use of virtual mouse.

3.2 Software Interfaces

Gestures recognition is the mathematical interpretation of a human body motion by a computer device

Human-computer interaction (HCI) in area research and practice that emerged in the early 1980s.

3.3 Communications Interfaces

The proposed system makes use of the webcam for tracking the user's hand and to recognize the gestures for the purpose of interaction with the system. The threshold boundary is introduced for faster detection of hand and recognition of gestures. Mouse activities are done by recognizing the gestures. The work will be extended for real time tracking and additional mouse activities. To solve the problems, a system can be used called

Gesture Recognition System. A primary goal of this gesture recognition is to create a system which can identify specific human gestures and use them to convey information to control traffic signals as per traffic controller's wish and also for controlling the mouse.

4. System Features

Based on machine learning and python language

4.1 System Feature 1

Machine learning (ML) is a category of algorithm that allows machines to "learn" with data, without being explicitly programmed.

A branch of "Artificial Intelligence", concerned with the design and development of algorithms that allow computers to evolve behaviours based on data.

4.2 System Feature 2 (and so on)

5. Other Nonfunctional Requirements

No need for other external parts like keyboard mouse, touchpad thus use to easy work for every students and employs after than we can say virtual mouse is more than useful and easy to use and no need for other nonfunctional requirements.

6. Business Rules

A **'VIRTUAL MOUSE'** is a software component that allows the input of characters without the need for physical mouse.

We propose a novel approach that uses a video device to control the mouse system.

This project removes the requirements of having a physical device to control mouse functions.

Basically the project is based on "Gesture Recognition Technology".

7. Other Requirements

Web cam.

Python programming language.

OpenCV (Open Source Computer Vision Library) is a library of programming functions mainly aimed at real-time computer vision.

Appendix

We are developing a system to control the mouse cursor using a real-time camera.

This system is based on computer vision algorithms and can do all mouse tasks.

However, it is difficult to get stable results because of the variety of lighting and skin colors of human races.

This system could be useful in presentations and to reduce work space.

Future Scope

In the future, we plan to add more features such as enlarging and shrinking windows, closing window, etc. by using the palm and multiple fingers

We can also open the browser or any drives (C: /D:/E: etc)with the help of hand gestures instead of moving the cursor