Security based Automation using Hand Gesture Cognizance

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Abstract— **Hand gesture based security system is proposed in this proposed system. In this system, automatic door system is proposed. According to the system, hand movement is recognized. It gives more security for the home security system. Door can be accessed as per predefined hand movement. Also user can access through their mobile using blue tooth technologies.**

Keywords—

RISC=Reduced Instruction Set Architecture

USB=Universal Serial Bus

RTOS=Real Time Operating System

PLA=Programmbale Logic Array

IP=Internet Protocol

I. INTRODUCTION

Human computer interaction means the point where the human can tell the computer what to do and the Point where the computer displays the requested information. A human usually has 5 senses: Sight, Hearing, Touch, Taste, and Smell. A computer hasn't any senses as such; it is machinery, with electrons running around in and out of component devices. The basic goal of HMI is to improve the interaction between users and computers more usable and receptive to the user's need. HMI Sometimes called as Man-Machine Interaction or Interfacing, concept of Human-Computer Interaction/Interfacing (HCI) was automatically represented with the emerging of computer, or more generally machine, itself. The reason, in fact, is clear: most sophisticated machines are worthless unless they can be used properly by men. Why a system is actually designed can ultimately be defined by what the system can do i.e. how the functions of a system can help towards the achievement of the purpose of the system.

II. HOW GESTURE RECOGNITION WORKS

Gesture recognition technology has been considered to be the highly successful technology as it saves time to unlock any device. A person doesn't need to remember the security codes like passwords for its device, with the help of gesture recognition the person can unlock its device without any work. Mainly hand gestures are applicable. Gesture recognition can be conducted with techniques from computer vision and image processing. The literature includes ongoing work in the computer vision field on capturing gestures or more general human pose and movements by cameras connected to a computer.

Gesture recognition and pen computing: Pen computing reduces the hardware impact of a system and also increases the range of physical world objects usable for control beyond traditional digital objects like keyboards and Mouse. Such implementations could enable a new range of hardware that does not require monitors. This idea may lead to the creation of holographic display. The term gesture recognition has been used to refer more narrowly to non-text-input handwriting symbols, such as inking on a graphics tablet, multi-touch gestures, and mouse gesture identification. This is computer interaction through the drawing of symbols with a pointing device cursor. The Gesture Cognizance is mainly done in many aspects of several fields. Hand Gesture cognizance is easier to recognize and function.

III. INTRODUCTION TO EMBEDDED SYSTEMS

An Embedded System is one that has computer hardware with software embedded in it as one of its important components. An embedded computer is frequently a computer that is implemented for a particular purpose. In contrast, an average computer usually serves a number of purposes: checking email, surfing the internet, listening to music, word processing, etc. However, embedded systems usually only have a single task, or a very small number of related tasks that they are programmed to perform.

An embedded computer system is an electronic system, which includes a microcomputer .It is configured to perform a specific dedicated application. Software is programmed into Read Only Memory. This software is not accessible to the user of the device , and software solves only a limited range of problems .Here the microcomputer is embedded or hidden inside the system.

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Each embedded microcomputer system, accepts inputs, performs calculations, and generates outputs and runs in "real time."

For Example: A typical automobile nowadays contain an average of ten microcontrollers. In fact, modern houses may contain as many as 150 microcontrollers and on average a consumer now interacts with microcontrollers up to 300 times a day. General areas that employ embedded microcomputers encompass every field of engineering namely: Communications, automotive, military, medical, consumer, machine control etc.

IV. INTRODUCTION TO PYTHON CODING

Python is a widely used high-level programming language for general-purpose programming, created by Guido van Rossum and first released in 1991. An interpreted language, Python has a design philosophy which emphasizes code readability (notably using whitespace indentation to delimit code blocks rather than curly braces or keywords), and a syntax which allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java. The language provides constructs intended to enable writing clear programs on both a small and large scale.

Python features a dynamic type system and automatic memory management and supports multiple programming paradigms, including object-oriented, imperative, functional programming, and procedural styles. It has a large and comprehensive standard library. Rather than requiring all desired functionality to be built into the language's core, Python was designed to be highly extensible. Python can also be embedded in existing applications that need a programmable interface. This design of a small core language with a large standard library and an easily extensible interpreter was intended by Van Rossum from the start because of his frustrations with ABC, which espoused the opposite mindset. While offering choice in coding methodology, the Python philosophy rejects exuberant syntax, such as in Perl, in favour of a sparser, less-cluttered grammar. As Alex Martelli put it "To describe something as clever is not considered a compliment in the Python culture." Python's philosophy rejects the Perl "there is more than one way to do it" approach to language design in favour of "there should be one and preferably only one obvious way to do it".

V. HOW HAND GESTURE COGNIZANCE WORKS

Raspberry Pi3 is the main element that is used in hand gesture cognizance. It is a single board-computer which is highly customizable and it is equipped with USB Ports and Ethernet ports. The PLA is another important component that can be used in this methodology for implementing combinational arrays. RISC Architecture in the earlier periods utilized this methodology for accessing data transmission. IP Scanner software is used in order to access the IP of the Raspberry Pi3 from a remote location. Then OpenCV software is used to stream codes from a remote location to the Raspberry Pi3.The OpenCV is a library of

programmable functions aimed at RTOS. A Program Code is already written with the python code and it is stored in the OpenCV software for remote access. Then, the Raspberry Pi3 is connected to a motor interface and it is again interfaced to a Motor present in the Compact Discs. If the code transmitted turns out to be true, then the door will be opened in case of a correct hand gesture input otherwise the door will not be opened. The Block Diagram is given below in Fig.1.
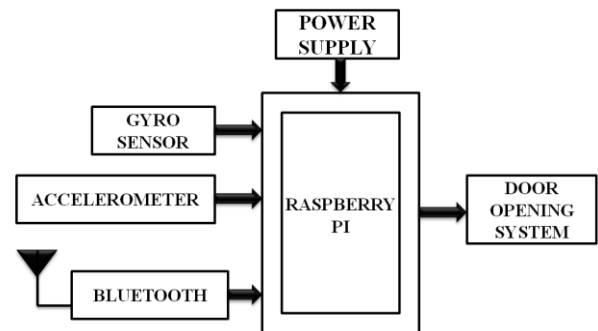
VI. BLOCK DIAGRAM

Fig. 1.

VII. APPLICATIONS

- The Hand Gesture Recognition is used in Gaming Industries

- The Hand Gesture Recognition is used in Safety Lockers in Banking Systems

- It can also be used in Vehicle Automation

- It can be used in a range of military applications such as AI certified Robots

VIII. FUTURE SCOPE

The Hand Gesture Cognizance can be used in a wide array of leagues and due to its easy user interface and portability, it is mandatory for it to be less difficult. Hence, it is highly recommended for Banking Safety Lockers and other automation sectors. The Hand Gesture Recognition can be used in a vast area of places such as in gaming industries and electronic components .The main motto is to be used in the banking sector s for security purposes. Automation in Vehicles can also find a place in the applications of the Hand Gesture Recognition. The Hand Gesture Cognizance can also be used in the automation development for Artificial Intelligence Development.

VII. ACKNOWLEDGEMENT

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