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HAND MOVEMENT BASED FAN SPEED CONTROLLING SYSTEM

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Abstract (10pt)

The aim of this project is to control fan speed through hand movement by using MEMS accelerometer sensor (Micro Electro-Mechanical Systems) technology. MEMS accelerometer sensor is a Micro Electro Mechanical Sensor which is a highly sensitive sensor and capable of detecting the tilt. This sensor finds the tilt and makes use of the accelerometer to change the speed of the fan using PWM (Pulse Width Modulation). Automation is the most frequently spelled term in the field of electronics. The hunger for automation brought many revolutions in the existing technologies. One among the technologies, which had greater developments, is the MEMS accelerometer sensor. These had greater importance than any other technologies due its user-friendly nature. MEMS accelerometer sensor based devices can be easily reachable to the common man due to its simpler operation, and at the same time it challenges the designers of the device. This project makes use of a micro controller, which is programmed, with the help of embedded C instructions. The MEMS accelerometer sensor based sensor detects the tilt and provides the information to the microcontroller (on board computer) and the controller judges whether the instruction is to decrease or increase the speed of the fan. The controller is interfaced with fan whose speed is either increased/decreased using hand movement. Also, the devices are operated wirelessly through MEMS accelerometer sensor. To perform the task, the controller is loaded with intelligent program written using Embedded 'C' language.

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1. Introduction

1.1 Embedded Systems:

An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors and Microcontrollers. Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result.

An embedded system can be defined as a computing device that does a specific focused job. Appliances such as the air-conditioner, VCD player, DVD player, printer, fax machine, mobile phone etc. are examples of embedded systems. Each of these appliances will have a processor and special hardware to meet the specific requirement of the application along with the embedded software that is executed by the processor for meeting that specific requirement. The embedded software is also called “firm ware”. The desktop/laptop computer is a general purpose computer. You can use it for a variety of applications such as playing games, *word* processing, accounting, software development and so on. In contrast, the software in the embedded systems is always fixed listed below:

Embedded systems do a very specific task they cannot be programmed to do different things. Embedded systems have very limited resources, particularly the memory. Generally, they do not have secondary storage devices such as the CDROM or the floppy disk. Embedded systems have to work against some deadlines. A specific job has to be completed within a specific time. In some embedded systems, called real-time systems, the deadlines are stringent. Missing a deadline may cause a catastrophe-loss of life or damage to property. Embedded systems are constrained for power. As many embedded systems operate through a battery, the power consumption has to be very low. Some embedded systems have to operate in extreme environmental conditions such as very high temperatures and humidity.

1.2 Overview of Embedded System Architecture

Every embedded system consists of custom-built hardware built around a Central Processing Unit (CPU). This hardware also contains memory chips onto which the software is loaded. The software residing on the memory chip is also called the ‘firmware’.

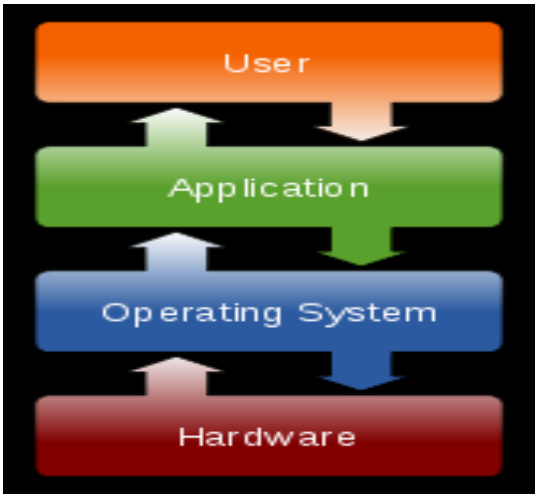

Fig 1.1 The building blocks diagram

The operating system runs above the hardware, and the application software runs above the operating system as shown in figure. The same architecture is applicable to any computer including a desktop computer. However, there are significant differences. It is not compulsory to have an operating system in every embedded system. For small appliances such as remote control units, air conditioners, toys etc., there is no need *for* an operating system and you can write only the software specific to that application.

For applications involving complex processing, it is advisable to have an operating system. In such a case, you need to integrate the application software with the operating system and then transfer the entire software on to the memory chip. Once the software is transferred to the memory chip, the software will continue to run *for* a long time you don't need to reload new software.

1.3 Application-specific circuitry:

Sensors, transducers, special processing and control circuitry may be required fat an embedded system, depending on its application. This circuitry interacts with the processor to carry out the necessary work. The entire hardware has to be given power supply either through the 230 volts main supply or through a battery. The hardware has to design in such a way that the power consumption is minimized.

1.4 Wireless Communication:

Wireless communication, as the term implies, allows information to be exchanged between two devices without the use of wire or cable. A wireless keyboard sends information to the computer without the use of a keyboard cable; a cellular telephone sends information to another telephone without the use of a telephone cable. Changing television channels, opening and closing a garage

door, and transferring a file from one computer to another can all be accomplished using wireless technology. In all such cases, information is being transmitted and received using electromagnetic energy, also referred to as electromagnetic radiation. One of the most familiar sources of electromagnetic radiation is the sun; other common sources include TV and radio signals, light bulbs and microwaves. To provide background information in understanding wireless technology, the electromagnetic spectrum is first presented and some basic terminology defined.

2. MEMS (Micro electro mechanical system)

2.1 Introduction

MEMS, which is abbreviated as Micro electro mechanical system, is a combination of mechanical and electrical systems. Its fabricated using micro fabrication technique. This acts as main functional block in our project. Its sensor device it has the capability of sensing the slightest tilt produced.

2.2 Application of MEMS

The mems module is placed in the upper or the lower panel present in the ATM machine. When a thief tries to open the panels of the ATM machine the tilt produced during opening the panel is read by the MEMS, this activates the microcontroller then the following sequence is initiated which includes shutting the door and alerting the vigilance system by sending a sms through GSM.

3. Applications:

- Scrolling of documents, maps and images larger than the display window.
- Web page browsing.
- Menu navigation.
- Automatic portrait-landscape adaption.

Motion control

4. Advantages:

1) Helpful for the paralysis stroke people who don’t have much stamina in the hands.
2) Reduces the human activity.
3) Reduces the physical strain.
4) Spontaneous output.

5. Conclusion

In this paper, hand movement based fan speed controlling system been successfully presented by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced ICs and with the help of growing technology the project has been successfully implemented.

References

[1] www.arm.com

[2] www.wikipedia.org

[3] www.zigbee.org

[4] www.nxp.com

[5] www.keil.com

[6] www.cadence.com

[7] www.ieee.org