© 2018 IJSRST | Volume 4 | Issue 3 | Print ISSN : 2395-6011 | Online ISSN: 2395-602X

National Conference on Advances in Engineering and Applied Science (NCAEAS)
29th January 2018
Organized by : Anjuman College of Engineering and Technology (ACET) Nagpur, Maharashtra, India, In association with
International Journal of Scientific Research in Science and Technology

Hand Gesture Based Robot Control

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ABSTRACT

Now a day's human-machine moving further from mouse to pen and is becoming more compatible with the physical world. Day by day the gap between human and machine is being reduced while introducing the new technology with the standards of living in electronics world. Gesture have played vital role in diminishing this abyss. This paper deals with design and implementation of an accelerometer based hand gesture using MEMS. The identification and recognition of posture, gait and human behaviours is also the subject of gesture recognition techniques. Using the concept of gesture recognition or MEMS technology, it is possible to interact naturally without any mechanical device.

Keywords: Accelerometer, MEMS, Gesture, Microcontroller, Robotics.

I. INTRODUCTION

A gesture is a form of non-verbal communication in which visible bodily actions communicate particular messages. It comprises of sound, light variation or any type of body movement based upon the type of gestures, they have been Captured via sound, touch, optical light, bionic and Motion Technologies through still camera, data glove, Bluetooth, infrared beams etc. A hand Gesture Control Robot is a kind of robot which is controlled by the hand gestures and not by using buttons.

The robot is equipped with two sections- Transmitting section and Receiving section.

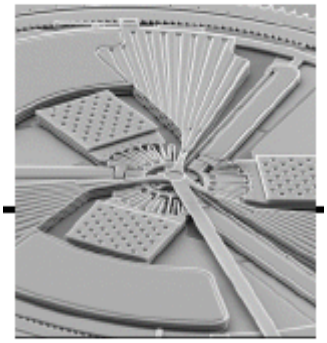
The Goal of this paper is to develop methods that helps user to control & program a robot with high level of abstraction from
robot specific language.

Microelectromechanical systems (**MEMS**) are the technology of the very small and merge at the nano-scale into nanoelectromechanical systems. MEMS are also referred to as micro machines (in Japan), or Micro Systems Technology - MST (in Europe).MEMS is an emerging technology which uses the tools and techniques that were developed for the Integrated Circuit industry to build microscopic machines. Since it is a photographic-like process, it is just as easy to build a million machines on the wafer as it would be to build just one.

II. METHODS AND MATERIAL

MEMS

Imagine a machine so small that it is imperceptible to the human eye. Imagine working machines no bigger than a grain of pollen. Imagine a world where gravity and inertia are no longer important, but atomic forces and surface science dominates. Imagine a silicon chip with thousands of microscopic mirrors working in unison, enabling the all optical network and removing the bottlenecks from the global telecommunications infrastructure. You are now entering the micro domain, a world occupied by an explosive technology known as MEMS.



A truly amazing MEMS device. It is a sophisticated MEMS Thermal Actuator

Figure 1

Most new cars have over a dozen MEMS devices, making your car safer, more energy efficient, and more environmentally friendly. MEMS are finding their way into a variety of medical devices, and everyday consumer products.MEMS devices are manufactured using batch fabrication techniques similar to those used for integrated circuits on a small silicon chip at a relatively low cost. Sensors gather information from the environment through measuring mechanical, thermal, biological, chemical, optical, and magnetic phenomena.

We are using MEMS ADXL103/ADXL203

ADXL103/203

The ADXL103/ADXL203 are high precision, low power, complete single- and dual-axis accelerometers with signal conditioned voltage outputs, all on a single, monolithic IC.

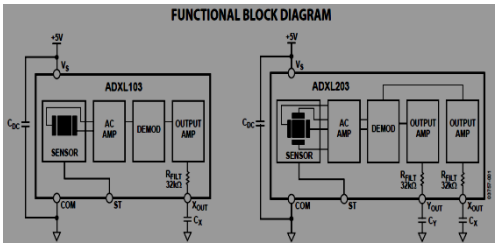


Figure 2

THEORY OF OPERATION

The ADXL103/ADXL203 is complete acceleration measurements systems on a single, monolithic IC. The ADXL103 is a single-axis accelerometer, and the ADXL203 is a dual-axis accelerometer. The ADXL103/ADXL203 is capable of measuring both positive and negative accelerations to at least ±1.7 g. The accelerometer can measure static acceleration forces such as gravity, allowing it to be used as a tilt sensor.

MOTORS

Motor is a device that creates motion, not an engine; it usually refers to either an electrical motor or an internal combustion engine. Industrial motors come in a variety of basic types. These variations are suitable for many different applications.

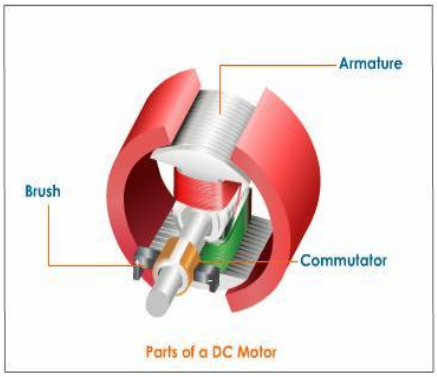


Figure 3

DC MOTOR

Working of a DC Motor

When the coil is powered, a magnetic field is generated around the armature. The left side of the armature is pushed away from the left magnet and drawn towards the right, causing rotation. When the coil turns through 90^0, the brushes lose contact with the commentators and the current stops flowing through the coil.

DC Motor Speed

Whereas the voltage polarity controls DC motor rotation, voltage magnitude controls motor speed. In other words, the higher the voltage, the quicker will the magnetic field become strong... As a result, motor speed is directly proportional to applied voltage.

Motor Speed Curve: One aspect to have in mind is that the motor speed is not entirely lineal. Each motor will have their own voltage/speed curve.

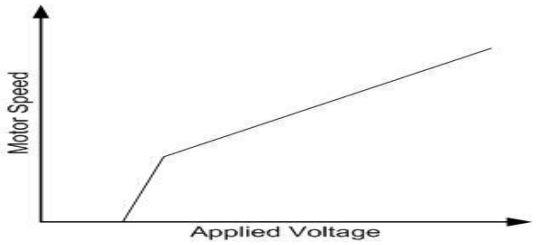


Figure 4

L293D Dual H-Bridge Motor Driver

L293D is a dual H-Bridge motor driver, L293D has output current of 600mA and peak output current of 1.2A per channel. Moreover for protection of circuit from back EMF output diodes are included within the IC. The output supply (VCC2) has a wide range from 4.5V to 36V, which has made L293D a best choice for DC motor driver.

RF COMMUNICATION:

How does an RF communication system work?

The RF communication system then utilizes this phenomenon by wiggling electrons in a specific pattern to represent information. The receiver can make this same information available at a remote location; communicating with no wires. In most wireless systems, a designer has two overriding constraints: it must operate over a certain distance (range) and transfer a certain amount of information within a time frame (data rate). Of this series, the HT12D is arranged to provide 8 address bits and 4 data bits.

THE MICROCONTROLLER: The AT89C51 is a low-power, high-performance CMOS 8-bit microcontroller with 4k bytes of Flash Programmable

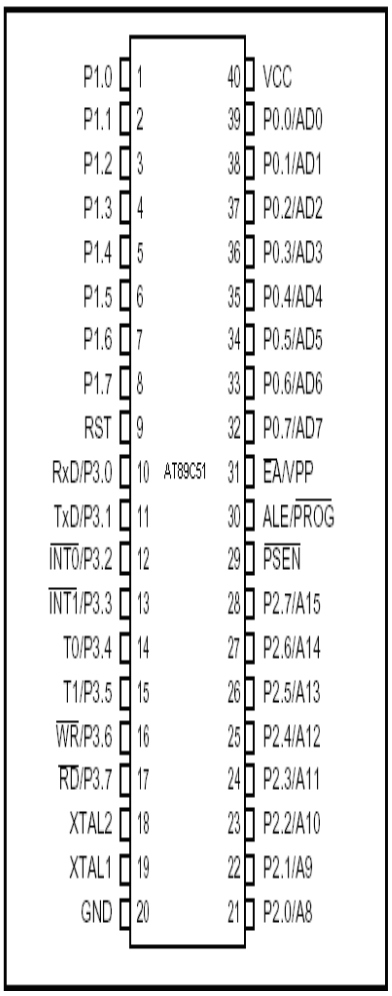


Figure 5

III. CONCLUSION

In this paper, various Methodologies have been analyzed and reviewed with their Merits and demerits under various operational and functional Strategies. Thus, it can be concluded that features like user Friendly interface, light weight and portability of android OS Based Smartphone has overtaken the sophistication of technologies like programmable glove, static cameras etc. Making them obsolete. This field have made wireless gesture controlling a ubiquitous phenomenon , it needs to acquire more focus in relevant areas of applications like home appliances, wheelchairs, artificial nurses , table top screens etc. this

IV. REFERENCES

[1]. Waldherr, S., Thrun, S., and Romero, R., "A Gesture based interface for Human-Robot Interaction", Kluwer Academic Publishers, Netherland, 2000.

[2]. Liu, T., Guo, H., and Wang, Y., "A new approach for color-based object Recognition with fusion of color models", Congress on Image and Signal Processing Conference, Sanya-China, vol. 3, pp. 456-460, May 2008.

[3]. Wang, B., and Yuan, T., "Traffic Police Gesture Recognition using Accelerometer", IEEE SENSORS Conference, Lecce-Italy, pp. 1080-1083, JUNE 2007.