SMART HAND

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ABSTRACT

The life of man has changed by leaps and bounds in recent times. This project represents yet another concept which can change our lives forever. With the concept VR (Virtual Reality) is the future, this project presents a novel system prototype that is able to automatically recognise gestures and converts into various signals like voice, text, etc.

Gestures are communicative, meaningful body motions – i.e., physical movements of the fingers, hands, arms, face or body with the objective to convey information or interact with the environment. Using this gestures home appliances and vehicles can be controlled virtually. This technology requires less space, which are easily portable, reliable and user friendly.

The concept of the project is to control the applications using Gestures produced by FLEX sensor and MEMS Accelerometer placed in gloves mounted on hand whose output is given to PIC Micro controller, the processed input transmitted using RF transmitter. At the receiver end, the signal is received using RF receiver and the pre-defined symbols or gestures are used to control the vehicle, virtual keypad and Sign language translation which can be used by deaf and dumb people to convey information.

Our project has endless possibilities with various applications from Gaming control in Virtual World to Vehicle Control in Real world. Our project is user friendly and can be easily adapted to any of advanced technologies from the future starting from VR Headset.

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 which is not portable

The idea is to make computers understand human language and develop a user friendly human computer interfaces (HCI). Making a computer understand speech, facial expressions and human gestures are some steps towards it. Gestures are the non-verbally exchanged information. A person can perform innumerable gestures at a time. Since human gestures are perceived through vision, it is a subject of great interest for computer vision researchers.

Our final dataset consists of ten letters of the ASL alphabet, namely a, b, c, d, f, g, h, i, k and x for sign language, predefined gestures for vehicle control and virtual keypad. This paper is to present a system that can efficiently translate above mentioned gestures to both text and audible sound. In this system, we are using of a data glove based technique which comparing the output of the flex sensor, and accelerometer. MEMS accelerometer is termed as Micro-Electromechanical system accelerometer. Accelerometers are used to detect and monitor vibration in the movements of an object. An accelerometer is a one kind of sensor which used to converts acceleration from motion to a voltage signal. We are using a flex sensor which produces an output voltage value directly proportional to the bending which is applied to the sensor itself.

In this project, we have designed and implemented the following Applications based on gestures successfully. The applications are

- Virtual Keypad
- Sign Language Recognition
- Vehicle Control
- Home Automation

OBJECTIVE AND METHODOLOGY

2.1 OBJECTIVE

The objective of this is to design and Implement a Smart Hand for following applications

- Virtual Keyboard for security purpose (ATM)
- Sign Language Recognition
- Vehicle Control
- Home Automation

2.2 METHODOLOGY

STEP 1: The gesture input from sensor is given to Microcontroller

STEP 2: The input is encoded and transmitted using RF Transmitter

STEP 3: The transmitted signal is received using RF Receiver

STEP 4: The received signal is decoded using decoder

STEP 5: The decoded signal is given to microcontroller for further process

2.3 Hardware Requirements

PIC Microcontroller

MEMS Accelerometer

Flex Sensor

IR Sensor

RF Transmitter and Receiver Module

2.4 Software Requirements

MS Visual Basic 6.0

HARDWARE DESCRIPTION

3.1 BLOCK DIAGRAM

Transmitter Section:

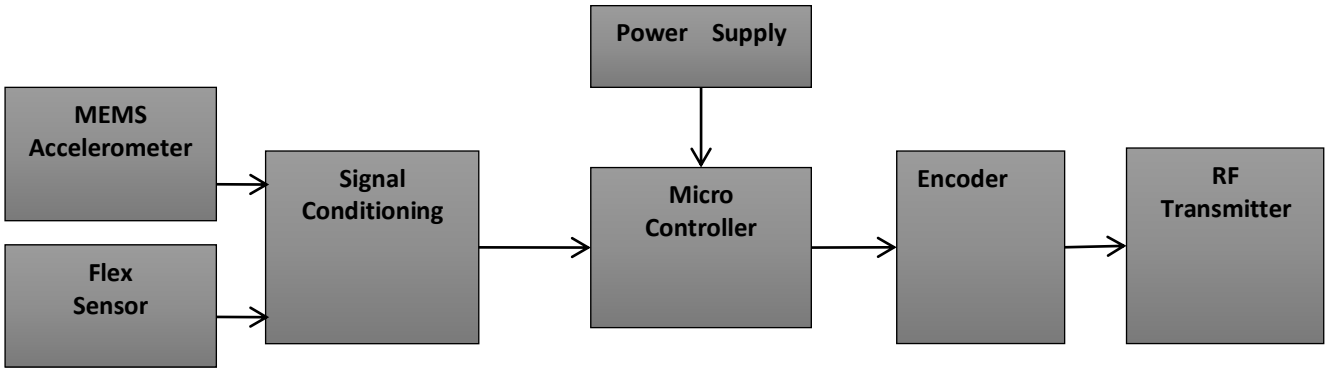

Fig.3.1 Transmitter Section

Receiver Section:

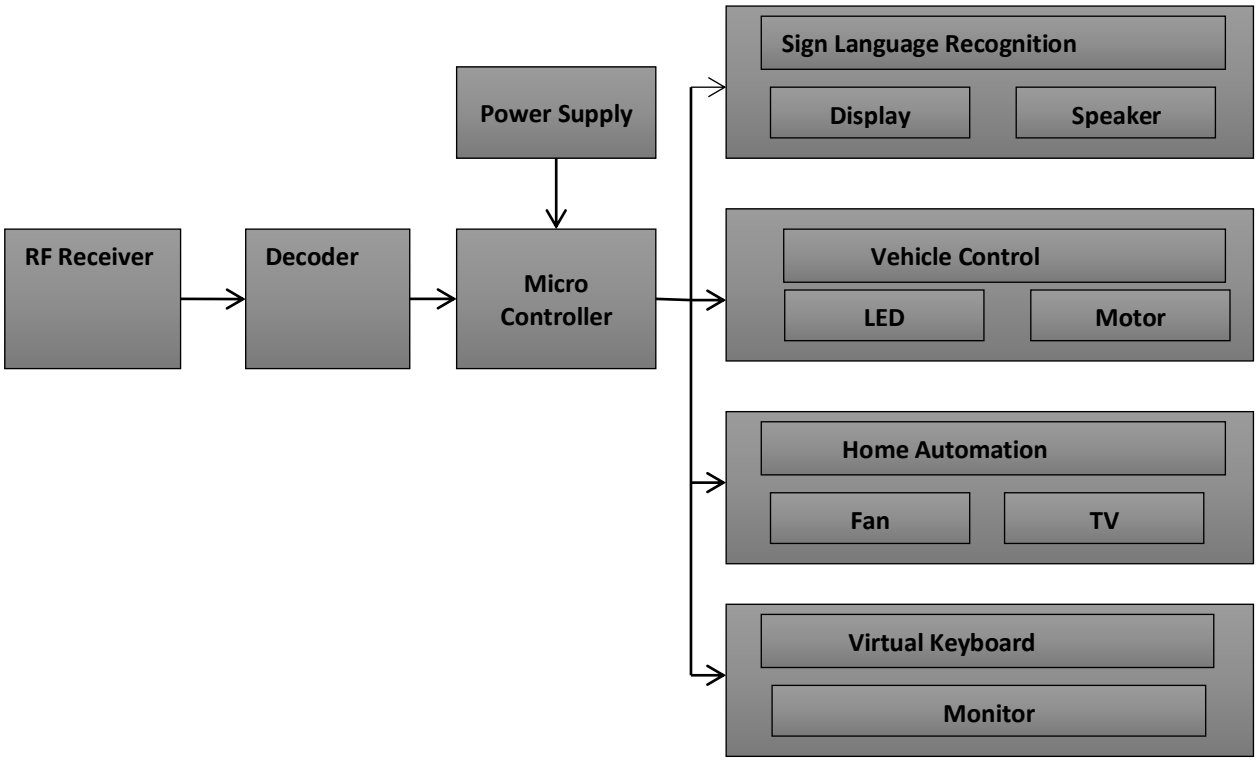

Fig.3.2 Receiver Section