

Gesture Recognition using RF Signals

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Abstract - Gesture recognition allows computers to capture and interpret human gestures as commands. The main objective of this project is to make use of the RF signals to control home appliances like fan and light. The project deploys the RF module consisting of a transmitter and a receiver. PIC16F877A micro-controller is used for overall operation. MEMS sensor is used for capturing gesture.

I. INTRODUCTION

Automation is the essential need for the present world. There are various types of automations like building automation and Home automation. Gesture recognition refers to recognising the motion of the human parts.

The circuit involves the major controller of PIC microcontroller PIC16F887 and a RF module of 434 MHz. The microcontroller is used in both the transmitter and the receiver sections. The general processing of gesture is by similar process of human created gesture which is given as input to the device. The signal is transmitted to the processing unit where the signal is processed and converted to either digital or analog form.

II. SYSTEM MODEL

The proposed method consist of two parts are transmitter and receiver circuits. The signal is transmitted through the small compatible device through gestures which is recognized by the receiver circuit and the devices are controlled.

III. PROPOSED METHODOLOGY

In transmitter shown in Fig 1.1, PIC microcontroller of PIC16F887 is used which is programmed using embedded C language. The controller is connected along with the MEMS Module which integrated externally for gesture sensing applications.

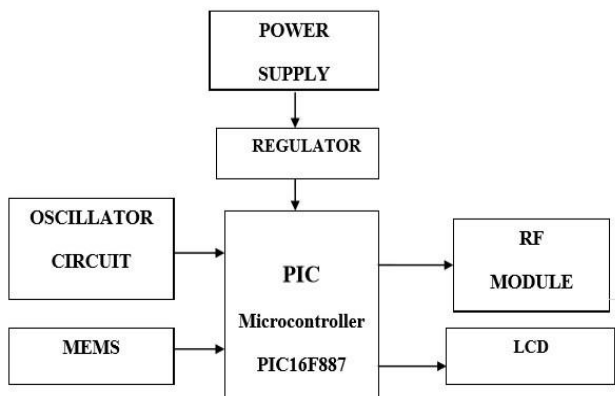


Fig. 1.1 Transmitter Block

The receiver circuit gives the detailed construction about the connectivity from the power supply to the output the devices. The receiver consists of light and a fan as a demo to be implemented which is shown in Fig. 1.2.

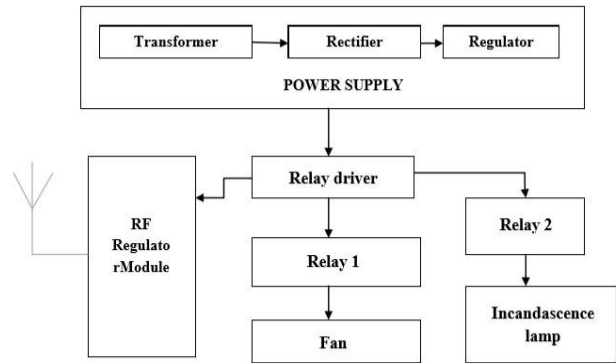


Fig. 1.2 Receiver Block

IV. SIMULATION/EXPERIMENTAL RESULTS

The snapshot of working output is shown in the Fig.1.3. where the complete model is done. When the MEMS sensor is tilted towards 180 degree at left, the Incandescence lamp is turned ON, and similarly if the sensor is moved in the same direction it is turned OFF. Similarly if the MEMS sensor is tilted towards 90 degree in the X-Axis then the fan would be turned ON, similarly if the sensor is gestured in the same direction again then it would be turned OFF. Both the devices could be consecutively turned ON and OFF. By alternatively changing the motion of the sensors.



Fig.1.3 Snapshot of Working Model

V. CONCLUSION

Gesture recognition is the developing concept in the digital era. Most of the electronic component manufacturers focus on the hand gesture basis. Controlling gadgets using Infrared remote control is easy. But the same controlling could be done more easily. The project deals with recognizing the gestures and controlling the home based appliances using wearable device. As the gestures are simple and easily understandable, it could be used by elders without any hesitations as it is not tedious or complex.

VI. FUTURE SCOPES

The future work to be done is to develop the project to control the entire home based devices. The same device could be manufactured as an industrial product by reducing the size and making it more compatible without using any wired-wearable devices. The product could be made compact to a size of a watch or a band which could be user defined and portable. This could be used as an extensive device to control all the devices in an entire building. The project mainly focuses on the application related to the medical purposes such as elderly persons who are half-paralyzed, patients admitted in emergency wards, etc.

In future, the transmitter and receiver can be minimized in size. So that they can be used as band which can be wearing in the hand.

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