

User Friendly Display of Menu Card in Restaurants using Reality Module and Zigbee[®] Technology

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Abstract— This paper mainly involves the implementation of Zigbee[®] technology, one can interact with virtual environment in a more user friendly manner. This technology replaces the classical use of keyboard and mouse. Anomalous optimization of this virtual realization makes people to adapt to the demands of rising technology. This allows the user to enter into the virtual world with the help of their senses. This form of interaction helps in newer perception of virtual world. In the present days, it is necessary that a waiter must be present in each and every restaurant to take the menu order from their customers. Our proposed system suggests a way which will completely eliminate the role of the waiter in getting the menu from the customer which can be achieved with the help of projection of the menu through the virtual reality module, selection of the menu directly by the customers by just touching them and transmission of the ordered menu through Zigbee[®] technology

Index Terms— Zigbee[®], Restaurants, Reality module, Menu, Virtual Realization.

I. INTRODUCTION

Looking around, we find ourselves to be surrounded by various types of embedded systems. Be it a digital camera or a mobile phone or a washing machine, all of them has some kind of processor functioning inside it. Associated with each processor is the embedded software. If hardware forms the body of an embedded system, embedded processor acts as the brain, and embedded software forms its soul. It is the embedded software which primarily governs the functioning of embedded systems..

II. OBJECTIVES

- The basic need for implementing this concept of virtual reality in restaurant's serving system is to eliminate the role of the waiter in getting the menu from the customer.
- It saves time to a major extent as there is no need for the customer to wait until the waiter comes to their table.
- This user friendly technique enables people to explore into the world of virtual reality.

Existing System

Only the suppliers have to serve the menu to the customers in the present world which is quite complex. So it is compulsory to have a waiter in each restaurant. Sometimes it may also lead to time delay for the customers to order their dishes to the waiter.

Proposed System

Our proposed system suggests a way which will completely eliminate the role of the waiter in getting the menu from each and every customer. It can be achieved with the help of projection of the menu through the virtual reality module, selection of the menu directly by the customers by just touching them and transmission of the ordered menu through zigbee technology.

III. DESIGN

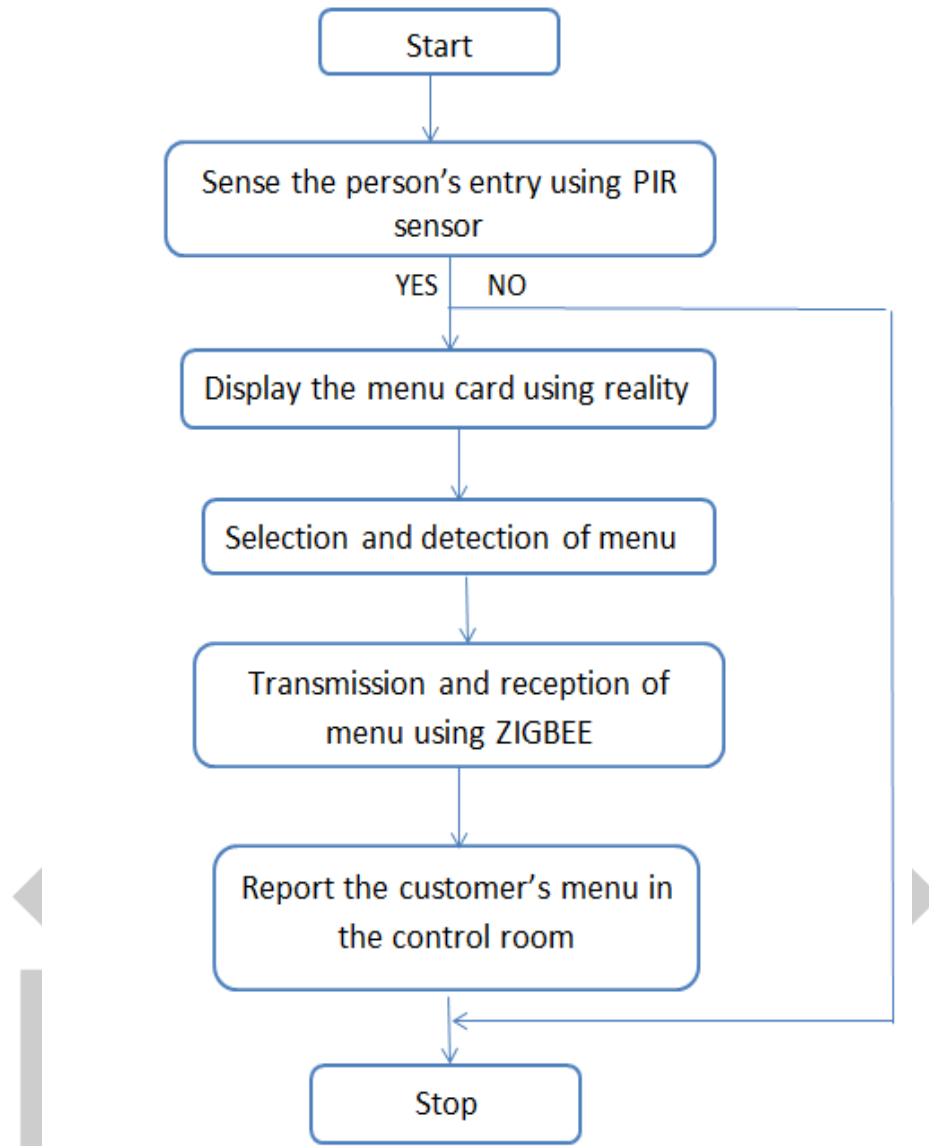


Fig 3.1: A Flowchart representing the whole transmission and reception process

Components Required

Hardware requirements

- PIC development board
- PIC16F877A Controller chip
- PIR sensor
- 16*2 LCD
- Virtual reality module
- Zigbee transceiver
- 9volt battery
- RS232 Cable
- Step down transformer 230v/12v
- Camera with detector

Software requirements

- Embedded C language
- HyperTerminal
- Track software
- MP LAB software

Block Diagram

At Transmitter,

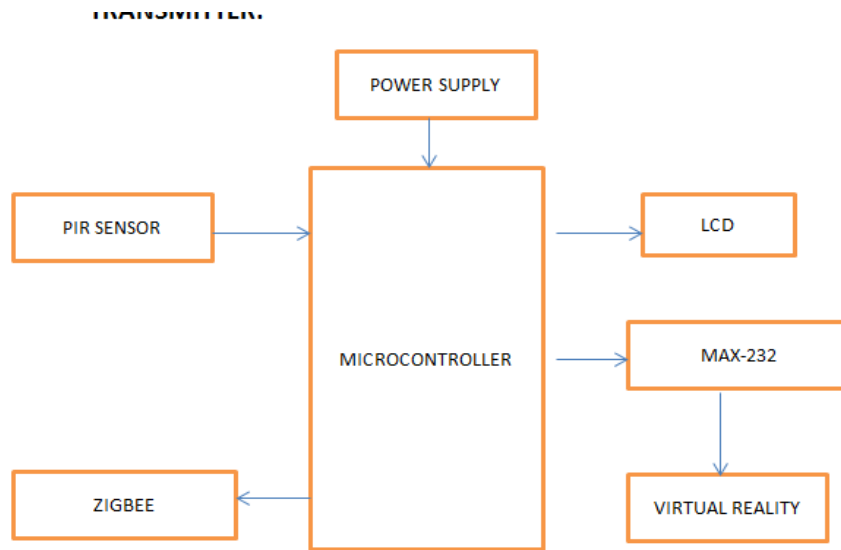


Fig 3.2: A Block Diagram showing the circuit design at the Transmitter

At Receiver,



Fig 3.3: A Block Diagram showing the circuit design at the Receiver

Circuit Design

PIC development board contains an integrated circuitry of ripple controllers, 7805 regulator, MAX232 TTL and a 10MHz crystal oscillator. Controller IC16F877A is dumped with the required program encrypted in embedded C language with a bit rate of 9600/sec [2]. The PIR (Passive Infrared Sensor) is connected to the RB2 pin of the PIC chip. The transceiver zigbee operates at 9V DC which decrypts the hexa input to understandable code[5]. Inter connection of zigbee and chip is done using RS232 cable in loop back shaking mode for a faster and efficient transmission of data without any packet losses other circuit interconnections are done through wires by soldering their metal contacts.

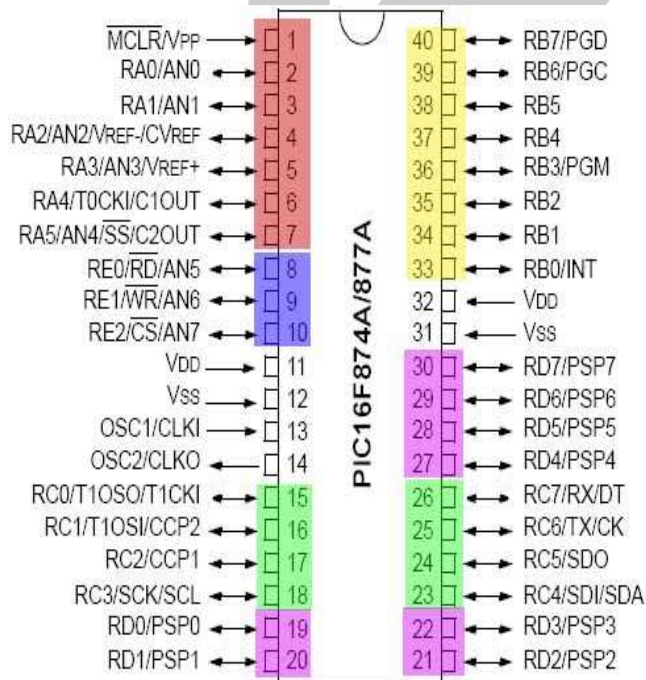


Fig 3.4: PIC16F877A (PIN CONFIGURATION)



Fig 3.5: PIC Board used in the project

IV. WORKING PRINCIPLE

A 230V/50Hz plug is used for power supply. The Passive Infrared Sensor (PIR) is used to detect the person’s entry. The camera fixed to the reality module continuously monitors the hand movements of the user. Camera is connected to the system where the user’s choice is being recorded using TRACK software[7]. Receiver zigbee is connected to the system and the transmitter zigbee is connected to the PIC board using RS232 cable. When the user touches the desired menu the camera detects it and sends the data to the control room via zigbee communication thus accomplishing our main objective.

Power Supply Unit

The supply of 5V DC is given to the system which is converted from 230V AC supply. Firstly, the step down transformer will be used here for converting the 230V AC into 12V AC. The microcontroller will support only the DC supply, so the AC supply will be converted into DC using the bridge rectifier. The output of the rectifier will have ripples so we are using the 2200uf capacitor for filtering those ripples[8]. The output from the filter is given to the 7805 voltage regulator which will convert the 12V DC into 5V DC. The output from the regulator will be filtered using the 1000uf capacitor, so the pure 5V DC is getting as the output from the power supply unit. Here we are using the PIC microcontroller which will be capable of getting the supply of 5V DC so we have to convert the 230V AC supply into 5V DC supply.

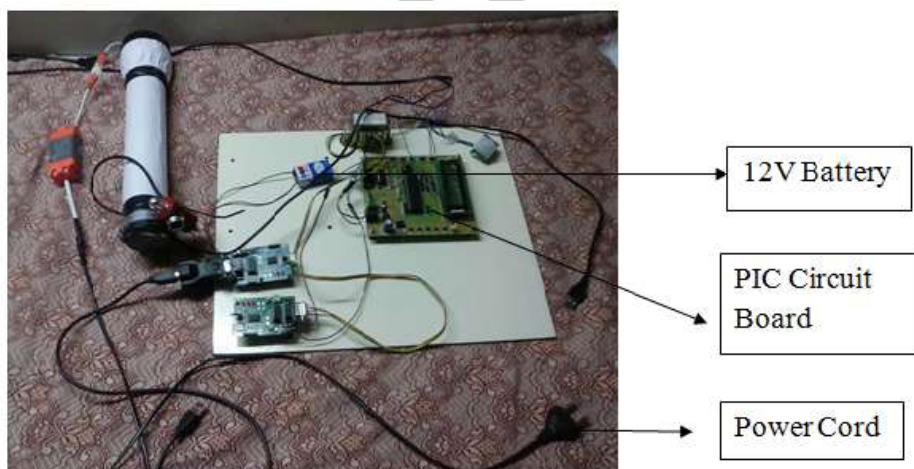


Fig 4.1: Power Supply Unit used in the project setup

Microcontroller Unit

The microcontroller unit is used to monitor the monitor the car drivers by using sensor, the corresponding information is send to the section by Zigbee, this operations are controlled by the controller. Here we use PIC microcontroller.



Fig 4.2: Microcontroller Chip

Display Unit

The display unit is mainly achieved by the 16X2 LCD. A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals (LCs). LCs do not emit light directly. In this project LCD is used to display sensor value.

Software Unit

Software is used to compile the coding of the desired application for the corresponding embedded system. In our project, HYPERTERMINAL© software is used and the codes are already dumped into the IC Chip[9].

Expected Input and Output

Power Supply Unit:

Given Input:

230V, 5A, 50 Hz AC Supply

Expected Output:

12V, 500mA- 1A, DC Voltage

PIC Microcontroller:

Given Input:

The Sensors output is given to the controller input that check details

Expected Output:

The Zigbee is fetched by the microcontroller to send the detected value to control section.

LCD:

Given Input:

The text from the microcontroller indicating the device status is given as input to the LCD.

Expected Output:

The received text is displayed on the LCD.



Fig 4.3: Projection through the Reality Module

Advantages

- Reduction in time consumption.
- The system automatically provides the menu in indoor without any manual work.
- Power consumption is comparatively low.
- Cost effective.

Applications

This technology can also be used in Supermarkets where the public can directly choose their commodities by just touching them on the projected screen. It can also be implemented in Hospitals.

Future Scope

Some of the techniques can be developed using this reality module:

- PROJECTION MAPPING: Car brands like Audi & Hyundai Accent have used projection mapping by splashing different colors & changing background scenery at the launch of their new cars[4]
- AUGMENTED REALITY: Augmented reality is a digitally-enhanced view of the real world using some tools & software[1].

V. ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression, “One of us (R. B. G.) thanks . . .” Instead, try “R. B. G. thanks”. Put applicable sponsor acknowledgments here; DO NOT place them on the first page of your paper or as a footnote.

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