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1.IoT based Weather Monitoring system using Raspberry Pi

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19U41A0403	
19U41A0405	
19U41A0407	
19U41A0410	
19U41A0412	

Abstract

Internet of Things (IoT) has provided a promising opportunity to build powerful industrial systems and applications by leveraging the growing ubiquity of RFID, wireless, mobile and sensor devices. A wide range of industrial IoT applications have been developed and deployed in recent years. The advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. This work proposes that the industrial monitoring by using Gas sensor, Temperature sensor, MEMS, Piezoelectric Sensor values to read the value and monitoring using Thingspeak system via Raspberry Pi.

ThingSpeak is an application platform for the Internet of Things. ThingSpeak allows to build an application around data collected by sensors. At the heart, ThingSpeak is a Channel where sent data to be stored. Each channel includes 8 fields for any type of data, 3 location fields, and 1 status field. Once ThingSpeak Channel is created, data can be published to the channel, can be processed and application can retrieve the data.

Existing System

- Manually Monitoring the Industrial application
- By using the GSM technology, it will take more time to get the exact situation
- CCTV camera monitoring is possible but can't able to sense the gas, temperature, and position of the valves.

Proposed System

- The Internet of Things is regarded as the third wave of information technology after Internet and mobile communication network, which is characterized by more thorough sense and measure, more comprehensive interoperability and intelligence.
- IoT Consumes the time and monitoring the exact situation.

Hardware

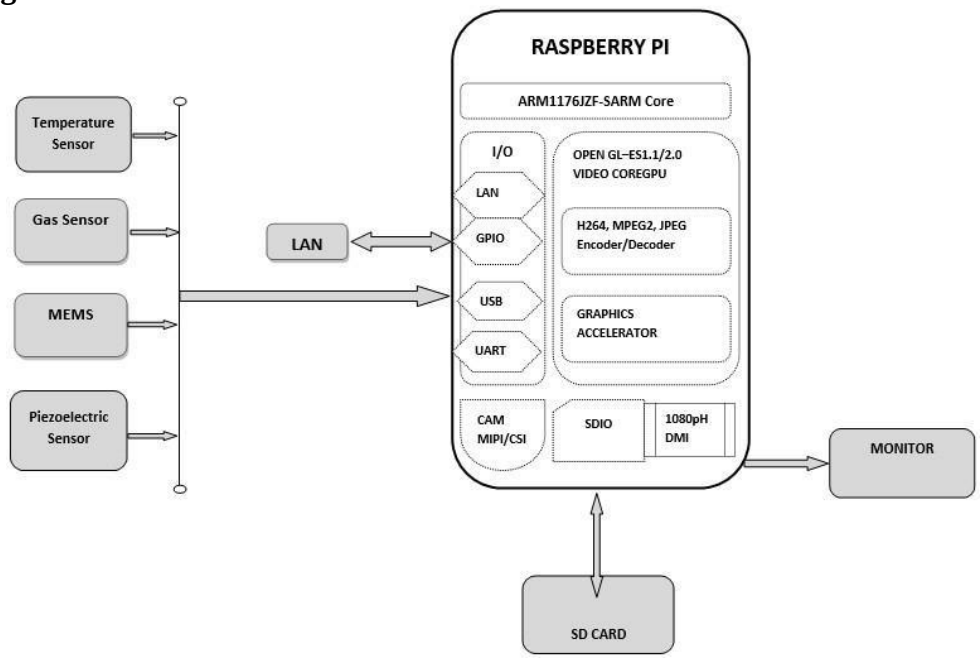
- Raspberry Pi
- Temperature Sensor

- Gas Sensor
- MEMS Sensor
- Piezoelectric Sensor

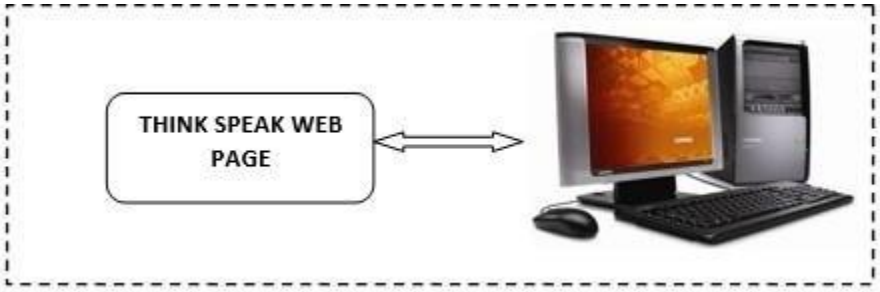
Software

- OS: Raspbarian OS
- Python Language

Block Diagram



Monitoring Section



Advantages

- Decreased field damaging conditions
- Improved safety and security
- High quality receiving data
- Less power consumption
- High speed data rate

Applications

- Industry Monitoring
- Home Automation
- Medical Industry

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2. IoT based Health Monitoring System using Node MCU

19U41A0402	Guide Name Mrs. Archana BT, Asst.Professor
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19U41A0417	
19U41A0422	
19U41A0433	
19U41A0432	

Abstract

This work introduces a wireless health monitoring system that can monitor a human 24x7. Controlling and data processing is done through the NodeMCU ESP8266 board, all the sensors are connected to NodeMCU ESP8266. Through this system, we can measure ECG, heartbeat, BP, and temperature. Through sensors, it is possible to measure all these values. Here all the sensors are powered using USB. The analog sensors can be connected to MCP3008 through any of the eight analog pins. These values are then used for detecting any critical situation. In the case of a critical situation, an alert value displayed in Thingspeak. Also, it is possible to monitor the person's health from any location in the world through the Thingspeak cloud. Data from sensors is uploaded to the Thingspeak periodically without any interruption if the internet is available. Here NodeMCU ESP8266 is used for connecting the internet.

Introduction

Health is the most important part of any human's life without health it is useless to any treasure of life. Most humans live a busy life in which going to a doctor for weekly or even monthly checkup is an impossible task. Without monitoring health it is not possible to judge whether a person is healthy or sick. This problem leads to the design of a product which monitors health every day without going to a doctor. In this work, a system is designed as a prototype for monitoring alerting based on the health of a person. This system is fully automated little or no human help is needed. Any doctor can monitor the person from anywhere through the internet.

Existing System

- Diagnosing with the help of a doctor
- Conventional devices that can only measure a particular parameter
- Devices that have to be connected invasively to get measurements
- No automated system exists
- Smart watches are expensive and not specifically for healthcare

Proposed System

- In this work, a system for 24x7 human health monitoring is designed and implemented
- In this system, the NodeMCU ESP8266 board is used for collecting and processing all data

- Different sensors are used for measuring different parameters
- All this data is uploaded toThingspeak for remote analysis
- A nodeMCU ESP8266 module is used for connecting to the internet

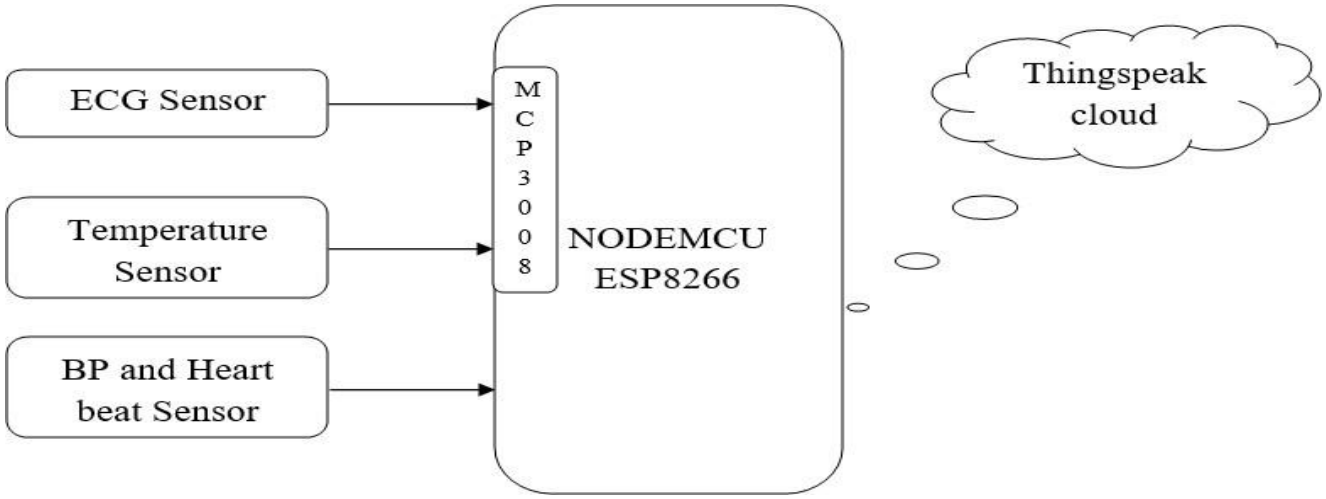
Hardware Required

- NodeMCU ESP8266
- ECG Sensor
- Heartbeat Sensor
- BP Sensor
- Temperature Sensor

Software Required

- Arduino IDE

Block Diagram



Block Diagram Description

- NodeMCU ESP8266 is the controller board which is a heart-whole system
- All the different analog sensors are connected through MCP3008 analog pins
- Here the NodeMCU ESP8266 connects the whole system to a Wi-Fi network
- Data from sensors are uploaded to the cloud

Conclusion

This system is very effective in monitoring a person's health continuously because it is fully automated. It can be tested very easily with any person. This system is a very good example of remote health monitoring.

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3. Smart Irrigation System using IoT and cloud

19U41A0406	Guide Name Ms. S Shabeena, Asst.Professor
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19U41A0425	
19U41A0430	
19U41A0438	

Abstract

This work presents the development of a smart sensor based environment monitoring system, in remote villages especially for crop fields. Basically, it is difficult to monitor the environment, weather all the time, so this work is proposed to monitor the weather and any environment changes using IoT through SMTP and MQTT which having some sensors like Temperature sensor, Moisture sensor, Gas sensor and LDR which measures respective parameters throughout the day. At the same time sensors are not having ability to predict the weather accurately, so weather cloud is used to know the current weather and climate change yet to happen, like every weather information is monitored, when there are any chances of rain in weather cloud then the camera gets triggered and capture the image of the atmosphere with the data log of current weather logs and upcoming weather logs are sent to mail by the user. And also parameters measured by sensors are sent through MQTT protocol, which having the common node, whenever MQTT client comes into the network, not only the current data log, but also the old data also sent to that MQTT client which has high speed transmission.

Introduction

Beginning with the quote “SAVE THE AGRICULTURE”, main factor of agriculture is to predict the climatic changes, here we are using IoT for monitoring the weather as well as atmospheric changes throughout the crop field by having several systems in different fields as clients, which is getting reported every time to the server, about the current atmospheric change at that every certain place. So that, watering and pesticides can be served based on the conditions of the field.

Existing system

In the existing system, all weather predictions and environmental change are done manually and they are using WSN for the communication, it is actually slower than MQTT so that transmission occurs slowly which also may cause a collision, when client is disconnected unexpectedly.

Proposed system

In this proposed system, both sensors and weather forecasting cloud is used, so that resulting data having high accuracy about the environment, also using MQTT (Message Queuing Telemetry Transport) which is very much faster than WSN, yields good result. By this system all

gets processed automatically, if there is any possibility of rain in weather cloud, then the current climatic conditions and upcoming possibilities of rain data log and also the current image of the environment will be sent to the user's mail. At that time sensor's data were sent to the MQTT client, whenever the client comes into the network, they will receive that data.

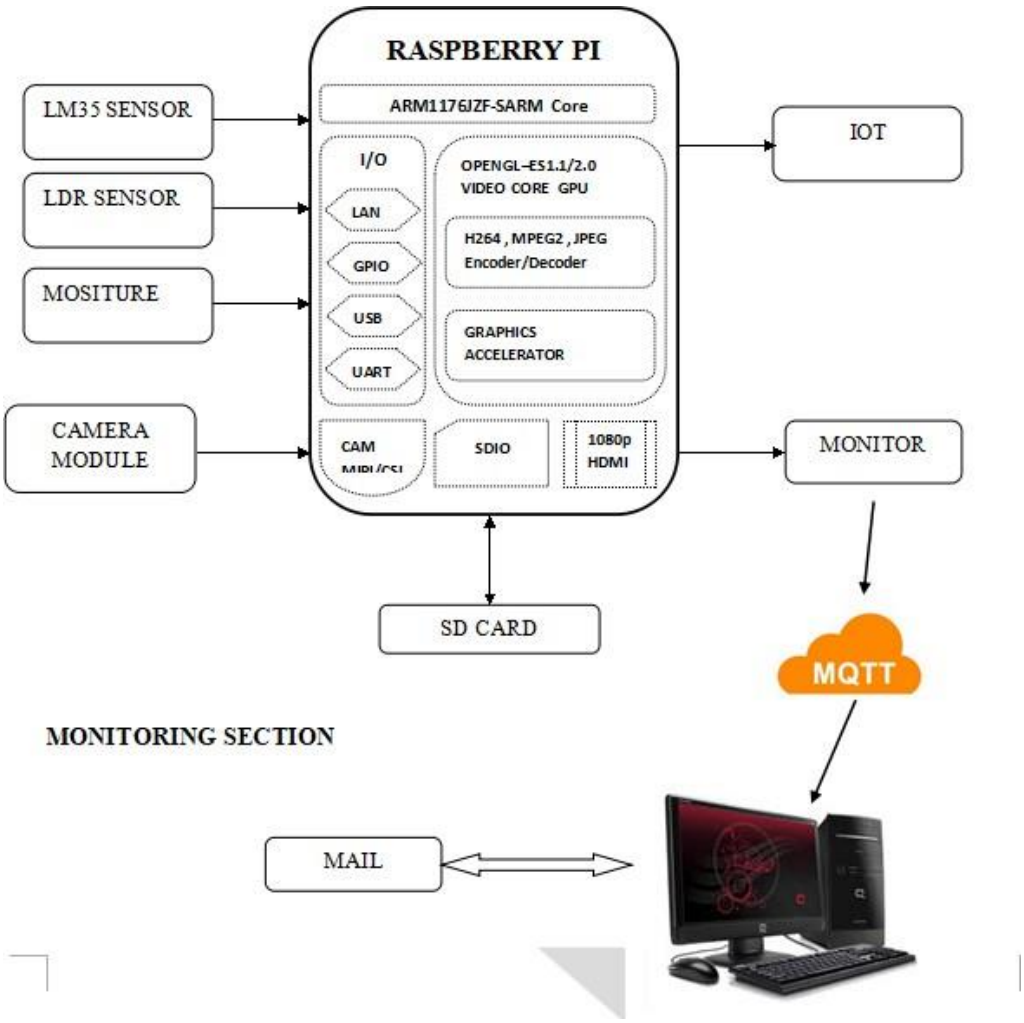
Hardware required

- Raspberry Pi
- Temperature (LM 35)
- LDR
- Moisture Sensor
- Smoke sensor
- MCP3008 (ADC IC)
- USB Camera
- SD card
- Monitor

Software required

- Raspbarian Jessie

Block diagram



Block diagram

- In this work, MCP3008 is used, so connect 3.3v pin from raspberry to all sensors
- Similarly MCP3008 and all sensor's ground pins should be grounded
- Now connect the sensor's output pins to each channel of MCP3008 (ex: LM-35 to channel 0, LDR to channel 1 and Moisture sensor to channel 2 of MCP3008)
- Connect USB camera with raspberry pi
- Connect power supply for Raspberry pi
- Plug the HDMI cable in Raspberry pi from the monitor using VGA to HDMI converter cable
- Connect USB Mouse and USB keyboard to the Raspberry pi
- PHP
- MQTT Protocol
- Language – Linux
- Python

Conclusion

According to this system, irrigation system becomes more autonomous with quick transmission of data by using MQTT protocol. The main advantage in MQTT protocol is, even when clients are not in the node network, data will be sent, whenever a client is connected with that node, they can able to see the data which has been sent already. So that, they can able to analyze the atmospheric change throughout every day.

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4. IoT based Smart Waste Management System using Arduino

19U41A0409	Guide Name Mrs. P Amrutha, Asst.Professor
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19U41A0415	
19U41A0421	
19U41A0424	
19U41A0426	

ABSTRACT

In this work, a system is introduced to manage waste in big cities effectively without having to monitor the parts 24x7 manually. Here the problem of unorganized and non-systematic waste collection is solved by designing an embedded IoT system that will monitor each dumpster individually for the amount of waste deposited. Here an automated system is provided for segregating wet and dry waste. A mechanical setup can be used for separating the wet and dry waste into separate containers here sensors can be used for separating wet and dry. For detecting the presence of any waste wet or dry can be detected using an IR sensor in the next step for detecting wet waste a moister sensor can be used. In this process, if only IR is detected motor will rotate in the direction of the dry waste container if both the sensor detects the waste then it will go to the wet container. Both these containers are embedded with ultrasonic sensors at the top, the ultrasonic sensor is used for measuring distance. This makes it possible to measure the amount of waste in the containers if one of the containers is full then an alert message will be sent to the corresponding person.

INTRODUCTION

Today big cities around the world are facing a common problem, managing the city waste effectively without making city unclean. Today's waste management systems involve a large number of employees being appointed to attend a certain number of dumpsters this is done every day periodically. This leads to a very inefficient and unclean system in which some dumpsters will be overflowing some dumpsters might not be even half full. This is caused by variation in population density in the city or some other random factor this makes it impossible to determine which part needs immediate attention. Here a waste management system is introduced in which each dumpster is embedded in a monitoring system that will notify the corresponding personal if the dumpster is full. In this system, it is also possible to separate wet and dry waste into two separate containers. This system provides an effective solution to the waste management problem

EXISTING SYSTEM

- Manual systems in which employees clear the dumpsters periodically
- No systematic approach towards clearing the dumpsters
- Unclear about the status of a particular location

- Employees are unaware of the need for a particular location
- Very less effective in cleaning city

PROPOSED SYSTEM

- In this work, a 24x7 monitoring system is designed for monitoring dumpsters
- Here a smart and organized system is designed for selective clearing
- The ultrasonic sensor is used for measuring the level of waste in the dumpster
- DC motor powered platform is used for segregating wet and dry waste
- IR sensor and moisture sensor is used for separating wet and dry waste
- If either of the containers is full then an alert message is sent from the dumpster
- In turn, employees can clear the corresponding dumpster
- All these sensors are connected to an Arduino UNO board
- It can be used for controlling all mechanical setup based on current conditions

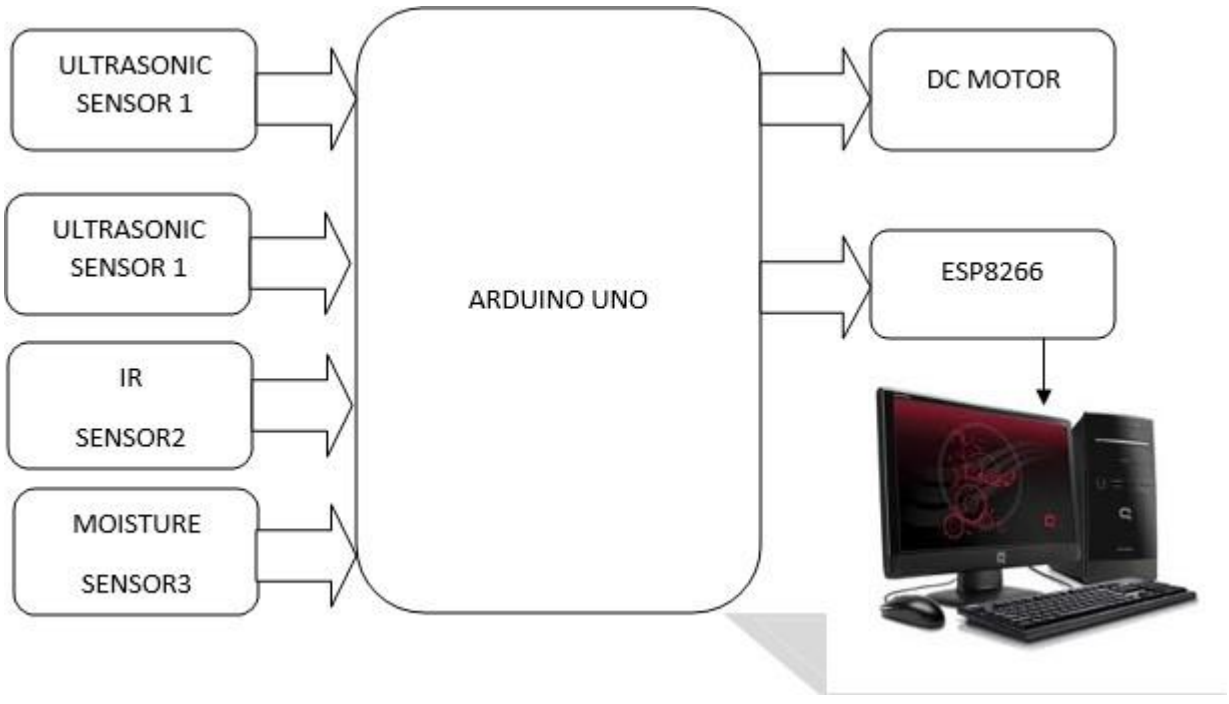
HARDWARE REQUIREMENTS

- Arduino UNO
- Ultrasonic Sensor
- IR Sensor
- Moisture Sensor
- Dc Motor

SOFTWARE REQUIREMENTS

- Arduino IDE

BLOCK DIAGRAM



BLOCK DIAGRAM DESCRIPTION

- Ultrasonic sensor Sensors measure distances by using ultrasonic waves. The sensor emits an ultrasonic wave and receives the reflected wave back from the target.
- IR Sensor emits in order to sense some aspects of the surroundings.
- Moisture Sensor measures the volumetric water content in the soil. ... Reflected microwave radiation is affected by the soil moisture and is used for remote sensing hydrology and agriculture.
- DC motor which is connected to the digital pins of Arduino
- Serial monitor for the display

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5. Greenhouse Monitoring and Control System using IOT Project

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19U41A0419	
19U41A0427	
19U41A0431	
19U41A0434	

Abstract

A green house is where plants such as flowers and vegetables are grown. Greenhouses warmup during the day when sun-rays penetrates through it, which heats the plant, soil and structure. Green houses help to protect crops from many diseases, particularly those that are soil borne and splash onto plants in the rain. Greenhouse effect is a natural phenomenon and beneficial to human being. Numerous farmers fail to get good profits from the greenhouse crops for the reason that they can't manage two essential factors, which determines plant growth as well as productivity. Green house temperature should not go below a certain degree, High humidity can result to crop transpiration, condensation of water vapour on various greenhouse surfaces, and water evaporation from the humid soil. To overcome such challenges, this greenhouse monitoring and control system comes to rescue. This Work demonstrates the design and implementation of a various sensors for greenhouse environment monitoring and controlling. This greenhouse control system is powered by Atmega328 microcontroller it consists of temperature sensor, light sensor, soil moisture sensor, LDR sensor, LCD display module, 12v DC fan, Bulb and pump. Temperature sensor senses the level of temperature, if it goes high DC fans gets on and when the temperature goes low the fan gets off. Soil moisture sensor, senses the water level as the level decreases the pumps gets on. In the absence of light, the LDR sensor senses and the bulb start glowing. By this way it will become easy to monitor and control the system.

Hardware Specifications:

- At mega Controller
- WIFI
- Moisture Sensor
- Light Sensor
- Temperature Sensor
- LCD
- DC FAN
- Bulb holder
- AC Pump
- Crystal Oscillator
- Resistors
- Capacitors

- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch
- IC
- IC Sockets

Software Specifications:

- Python
- MC Programming Language: C
- IOT Gecko

Block Diagram:

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6. IOT Early Flood Detection & Avoidance

19U41A0429	Guide Name Mr. R Suneel Asst.Professor
19U41A0408	
19U41A0419	
19U41A0427	
19U41A0431	
19U41A0434	

Abstract:

"IoT Early Flood Detection & Avoidance System" is an intelligent system which keeps close watch over various natural factors to predict a flood, so one can embrace themselves for caution, to minimise the damage caused by the flood. Natural disasters like a flood can be devastating leading to property damage and loss of lives. To eliminate or lessen the impacts of the flood, the system uses various natural factors to detect flood. The system has a wi-fi connectivity, thus it's collected data can be accessed from anywhere quite easily using IoT.

To detect a flood the system observes various natural factors, which includes humidity, temperature, water level and flow level. To collect data of mentioned natural factors the system consist of different sensors which collects data for individual parameters. For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor. It is an advanced sensor module with consists of resistive humidity and temperature detection components. The water level is always under observation by a float sensor, which works by opening and closing circuits (dry contacts) as water levels rise and fall. It normally rest in the closed position, meaning the circuit is incomplete and no electricity is passing through the wires yet. Once the water level drops below a predetermined point, the circuit completes itself and sends electricity through the completed circuit to trigger an alarm. The flow sensor on the system keeps eye on the flow of water.

The water flow sensor consists of a plastic valve body, a water rotor, and a hall-effect sensor. When water flows through the rotor, rotor rolls. Its speed changes with different rate of flow. The system also consists of a HC-SR04 Ultrasonic Range Finder Distance Sensor. The Ultrasonic sensor works on the principle of SONAR and is designed to measure the distance using ultrasonic wave to determine the distance of an object from the sensor. All the sensors are connected to Arduino UNO, which processes and saves data. The system has wi-fi feature, which is useful to access the system and its data over IoT.

Hardware Specifications

- Arduino Uno
- Wifi Module

- Temperature Humidity Sensor
- Ultrasonic Sensor
- Water Flow Sensor
- Water Level Sensor
- LCD Display
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch
- IC
- IC Sockets

Software Specifications

- Arduino Compiler
- MC Programming Language: C
- IOT Gecko

Block Diagram:

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