

TEMPERATURE AND HUMIDITY MONITORING IN ROBO ASSEMBLY USING IOT

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Abstract:

IOT or internet of things is an upcoming technology that makes use of internet to control/monitor electronic/mechanical devices, automobiles and other physical devices connected to the internet. IOT gives user the ability to control and monitor more than digital things easily through a comfortable GUI over the internet. To track the changes in weather and take necessary actions and updating the status of weather in Website. User can monitor the weather from anywhere in the project is designed to develop an Weather monitoring system through out world. The project uses an Arduino which is programmed to receive the input signal of varying moisture and temperature through the sensing arrangement. This is achieved by using an ADC (Analog to Digital Converter) as comparator which acts as interface between the sensing arrangement and the microcontroller. This sensor values are calculated by Arduino and send to the webpage server over internet. Wi-Fi Module is used as an interface between the temperature-humidity unit and the Webpage. This Wi-Fi module is used to send the status of Pump to Webpage over Internet. A HTML page is used to Remote view of weather status from anywhere in the world.

Keywords:

Arduino, DHT-11 Temperature and humidity sensor, LCD Panel, WI –FI module ESP8266, Thing speak channel

I. INTRODUCTION

An embedded system is a use today. Ninety-eight percent of all microprocessors are manufactured as components of embedded systems. computer system with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common

Examples of properties of typically embedded computers when compared with general-purpose counterparts are low power consumption, small size, rugged operating ranges, and low per-unit cost. This comes at the price of limited processing resources, which make them significantly more difficult to program and to interact with. However, by building intelligence mechanisms on top of the hardware, taking advantage of possible existing sensors and the existence of a network of embedded units, one can both optimally manage available resources at the unit and network levels as well as provide augmented functions, well beyond those available. For example, intelligent techniques can be designed to manage power consumption of embedded systems.

Modern embedded systems are often based on microcontrollers, but ordinary microprocessors are also common, especially in more-complex systems. In either case, the processor(s) used may be types ranging from general purpose to those specialized in certain class of computations or even custom designed for the application at hand. A common standard class of dedicated processors is the digital signal processor.

Since the embedded system is dedicated to specific tasks, design engineers can optimize it to reduce the size and cost of the product and increase the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.

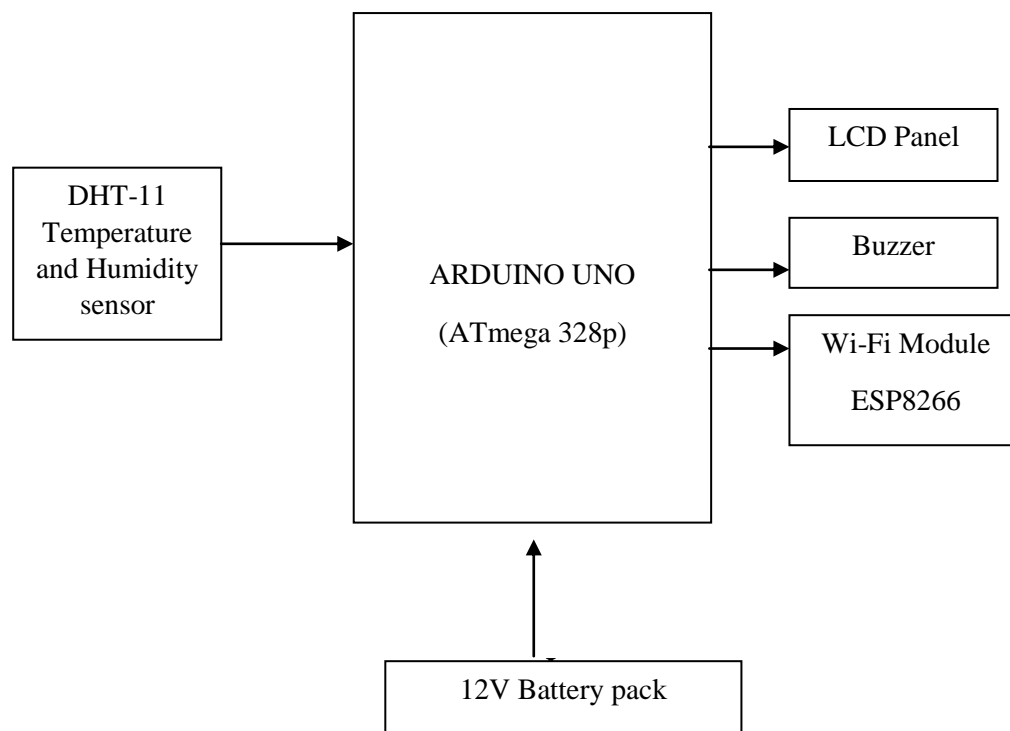
In general we can this temperature and humidity monitoring in robo applications like robo inspection in how the robo is going to work in operating conditions for efficient working

II. LITERATURE SURVEY

1] **Nihal Kularatna and B.H.Sudantha** showed natural air contamination checking framework in 2008. The structure in perspective of the IEEE 1451 standard. In this paper STIM showed transducer interface module was made which involves microcontroller and social event of various sensors like CO₂, CO, NO₂, and O₃. This likewise used Individual PC for graphical depiction. STIM related with the PC by methods for transducer independent interface which uses IEEE 1451 standard.

[2] **Y.J.Jung and Y.K.Leem** make air contamination checking framework utilizing Geosensor organize in 2008. Geosensor system is utilized to recognize the state of remote place. In this setting model and idea of adaptable investigating between time change was familiar which constructs the battery lifetime. Setting model illustrated which chooses the dirtied ranges and fittingly alert message and prosperity rules send to the all inclusive community around there.

III. IMPLEMENTATION



IV. RELATED WORK

ESP8266 WIFI MODULE

The Internet of Things (IoT) is the network of everyday objects — physical things embedded with electronics, software, sensors, and connectivity enabling data exchange. Basically, a little networked computer is attached to a thing, allowing information exchange to and from that thing. Be it light bulbs, toasters, refrigerators, flower pots, watches, fans, planes, trains, automobiles, or anything else around you, a little networked computer can be combined with it to accept input (esp. object control) or to gather and generate informational output (typically object status or other sensory data). This means computers will be permeating everything around us — ubiquitous embedded computing devices, uniquely identifiable, interconnected across the Internet. Because of low-cost, networkable micro-controller modules, the Internet of Things is really starting to take off.

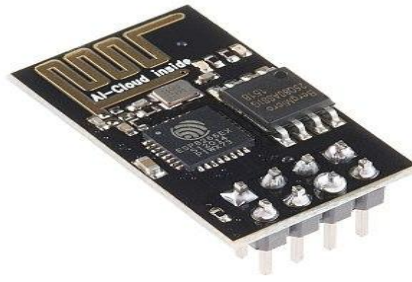


Fig 4.12: ESP8266 Wi-Fi module

The ESP8266 is a low-cost Wi-Fi chip with full TCP/IP stack and MCU (Micro Controller Unit) capability produced by Shanghai-based Chinese manufacturer, Espressif Systems.

DHT-11 TEMPERATURE AND HUMIDITY SENSOR

This DHT11 Temperature and Humidity Sensor features a calibrated digital signal output with the temperature and humidity sensor complex. Its technology ensures the high reliability and excellent long-term stability. A high-performance 8-bit microcontroller is connected. This sensor includes a resistive element and a sense of wet NTC temperature measuring devices. It has excellent quality, fast response, anti-interference ability and high cost performance advantages.



Fig 4.14: DHT-11 Temperature and Humidity sensor

Specifications

- Supply Voltage: +5 V
- Temperature range :0-50 °C error of ± 2 °C
- Humidity :20-90% RH $\pm 5\%$ RH error

THINGSPEAK WEBSITE

ThingSpeak is a platform providing various services exclusively targeted for building IoT applications. It offers the capabilities of real-time data collection, visualizing the collected data in the form of charts, ability to create plugins and apps for collaborating with web services, social network and other APIs.

The core element of ThingSpeak is a 'ThingSpeak Channel'. A channel stores the data that we send to ThingSpeak and comprises of the below elements:

- 8 fields for storing data of any type - These can be used to store the data from a sensor or from an embedded device.
- 3 location fields - Can be used to store the latitude, longitude and the elevation. These are very useful for tracking a moving device.
- 1 status field - A short message to describe the data stored in the channel.
- To use ThingSpeak, we need to sign up and create a channel. Once we have a channel, we can send the data, allow ThingSpeak to process it and also retrieve the same. Let us start exploring ThingSpeak by signing up and setting up a channel.

ARDUINO UNO

The Board

Arduino is a well known programmable board used to make ventures. It comprises of a straightforward equipment stage and in addition a free source code supervisor which has a "single tick incorporate or transfer" include. Thus it is composed in way that one can utilize it without essentially being a specialist developer. Arduino offers an open-source electronic prototyping stage that is anything but difficult to utilize and adaptable for both the product and equipment. Arduino can detect nature through accepting contribution from a few sensors. It is likewise ready to control its encompassing through controlling engines, lights and different actuators. The Arduino programming dialect that depends on the wiring and the Arduino improvement condition that depends on the handling are utilized to program the microcontroller found on the board. Because of its open-source condition, one can without much of a stretch compose and transfer codes to the I/O board. It is additionally worth to take note of that Arduino can be kept running on Linux, Macintosh OSX and Windows as its condition is composed in Java.

The Arduino Uno is a microcontroller board in view of the ATmega328. It has 14 computerized input/output pins (of which 6 can be utilized as PWM yields), 6 simple information sources, a 16 MHz gem oscillator, a USB association, a power jack, an ICSP header, and a reset catch. It contains everything expected to help the microcontroller; essentially associate it to a PC with a USB link or power it with an air conditioner to-DC connector or battery to begin.

The Uno varies from every single going before board in that it doesn't utilize the FTDI USB-to-serial driver chip. Rather, it includes the Atmega16U2 (Atmega8U2 up to rendition R2) customized as a USB-to-serial converter.

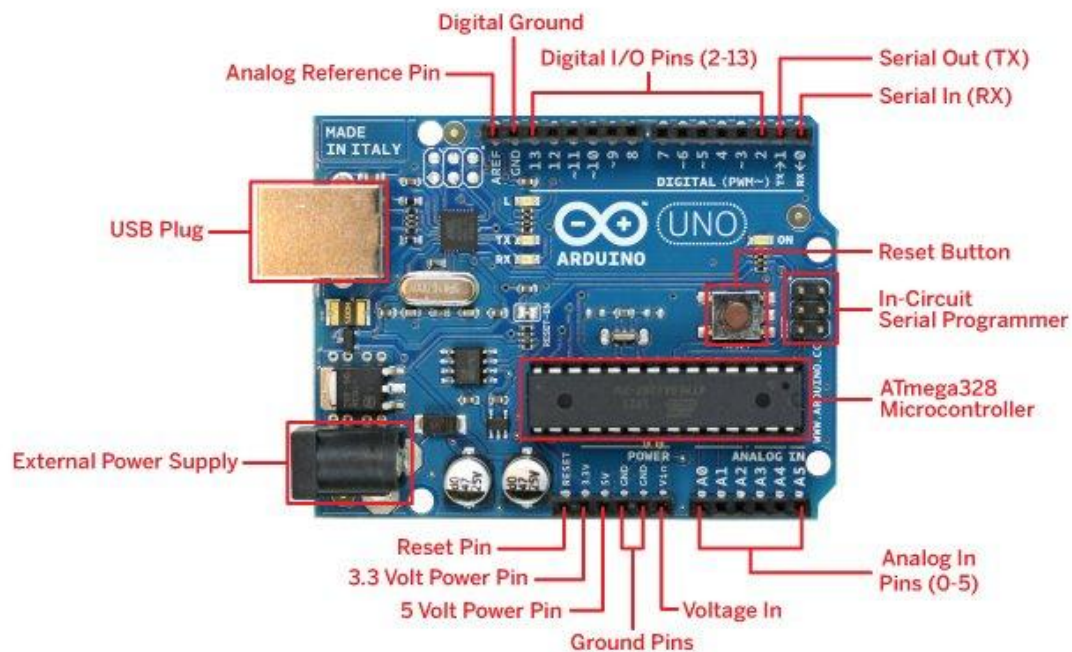
Modification 2 of the Uno board has a resistor pulling the 8U2 HWB line to ground, making it less demanding to put into DFU mode.

Amendment 3 of the board has the accompanying new highlights:

1.0 pinout: included SDA and SCL pins that are close to the AREF stick and two other new sticks set close to the RESET stick, the IOREF that enable the shields to adjust to the voltage gave from the board. In future, shields will be perfect both with the board that utilization the AVR, which work with 5V and with the Arduino Due that work with 3.3V. The second one is anything but an associated stick, which is held for future purposes.

stronger RESET circuit.

Atmega 16U2 replace the 8U2.



A labelled representation of Arduino Uno

V RESULTS

In our proposed system, the DHT11 sensor is used to sense the temperature and humidity of the released gas. The sensor is placed on a module which is placed at an area to survey continuously. These values are sent to a server named ThingSpeak

We thus obtain analytic data about the temperature and humidity for every iteration that the module uploads the data to the server. We can access this data from anywhere in the world if we have the channel ID. The data displayed shows the value detected from the sensor, the date, day and time at which that value was uploaded.

VI. CONCLUSION

The real success of the sensor network technology depends mainly on its application in eradicating a harmful situation or in maintaining a good one. Designing an efficient application is one of the major challenges and sensor network challenges are application dependent. Temperature and humidity monitoring is a prospective application domain which is of particular value to our country. Large cities with high concentration of industry, intensive transport networks and high population density are major sources of air pollution. Predicting air quality from multiple sources by using modelling is very complicated. So, air quality models are best used for isolated sources or situations.

Hence, in air pollution monitoring system, instead of reduced packet size and number of communication, usefulness of data is important. If the samples are collected and maintained once, it is possible to answer a wide range of queries out of network with accuracy. Society looks for a pollution-free globe for happy living. The global warming threat is waiting at the door. Government rules, governing pollution control in private sector industries are not implemented that effectively. This scenario stresses the need for an efficient monitoring system with the collaboration of users, domain experts, hardware designers and software developers. This study is an attempt in this direction.

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