

IOT based IDOL Security and Tracking System

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Abstract

Today, the growth of technology is rapid and provides all necessary and effective solutions for the requirements. One of the most important areas of concern is security. In this scenario, IOT based Idol tracking system is developed to increase the safety of temples. Arduino and Wi-Fi module connected with internet. This module is placed with the idol to be tracked which sends GPS data to blynk application. If the object being tracked moves out of its position, an alert notification will be sent to specified guardians through Global System for Mobile communication. Further the location of the object can be tracked whenever required through Global Positioning System. In addition, sound and vibration sensors are used to sense human behaviour like loud voice and movement of human body. If the sensor reading exceeds threshold value, messages are sent to specified mobile application.

1.1 INTRODUCTION

An embedded system is a computer system designed to perform one or a few dedicated functions often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today.

Embedded systems are controlled by one or more main processing cores that are typically either microcontrollers or digital signal processors (DSP). The key characteristic, however, is being dedicated to handle a particular task, which may require very powerful processors. 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.

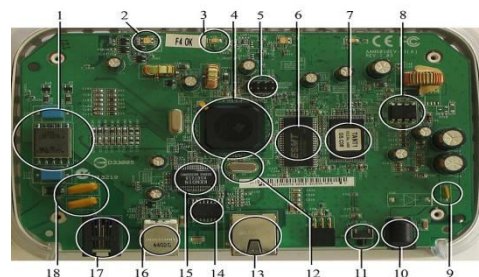


Fig 1.1: A modern example of embedded system

1.1.2 NEED OF EMBEDDED SYSTEM

The uses of embedded systems are virtually limitless, because every day new products are introduced to the market that utilizes embedded computers in novel ways. In recent years, hardware such as microprocessors, microcontrollers, and FPGA chips have become much cheaper. So when implementing a new form of control, it's wiser to just buy the generic chip and write your own custom software for it. Producing a custom-made chip to handle a particular task or set of tasks costs

far more time and money. Many embedded computers even come with extensive libraries, so that "writing your own software" becomes a very trivial task indeed.

1.1.3 CLASSIFICATIONS OF EMBEDDED SYSTEM

Stand Alone Embedded System

These systems takes the input in the form of electrical signals from transducers or commands from human beings such as pressing of a button etc., process them and produces desired output. This entire process of taking input, processing it and giving output is done in standalone mode.

E.g.: microwave oven, air conditioner etc.

Real-Time Embedded Systems

Embedded systems which are used to perform a specific task or operation in a specific time period those systems are called as real-time embedded systems. There are two types of real-time embedded systems.

Soft Real Time Embedded Systems

These embedded systems follow a relative dead line time period i.e., if the task is not done in a particular time that will not cause damage to the equipment.

E.g.: Consider a TV remote control system, if the remote control takes a few milliseconds delay it will not cause damage either to the TV or to the remote control.

Network Communication Embedded Systems

A wide range network interfacing communication is provided by using embedded systems. Consider a web camera that is connected to the computer with internet can be used to spread communication like sending pictures,

images, videos etc., to another computer with internet connection throughout anywhere in the world.

Consider a web camera that is connected at the door lock. Whenever a person comes near the door, it captures the image of a person and sends to the desktop of your computer which is connected to internet. This gives an alerting message with image on to the desktop of your computer, and then you can open the door lock just by clicking the mouse.

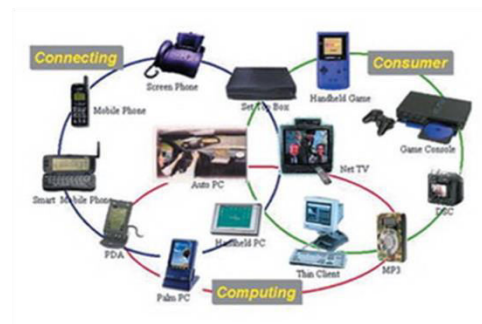
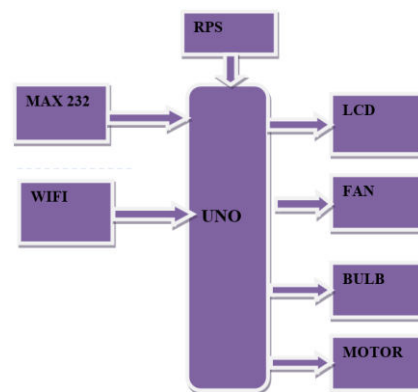


Fig 1.2: Network communication embedded systems



Block diagram

HARDWARE COMPONENTS REQUIRED:

- REGULATED POWER SUPPLY
- ARDUINO
- WIFI
- LCD
- FAN
- BULB

- BUZZER
- MOBILEPHONE

SOFTWARE TOOLS REQUIRED:

- ARDUINO IDE
- Flash the device using FlashMagic, a free software utility sponsored by NXP
- PCB WIZARD
- Windows XP

Design and Realization of Home Appliances Control System Based on The Android Smartphone present the information about the remote appliances control system based on the Android smart phone is designed and realized. A user logs into the smart phone interface, and clicks the buttons gently to send message commands which will be transmitted to home information Centre through the GSM network. Then the PIC processor recognizes the specified command, and controls the home appliance switches in the wireless radio frequency manner to achieve remote control of appliances ultimately. Exploiting Bluetooth on android mobile devices for home security application present the information about mobile device has been integrated into our everyday life. Home automation and security are becoming increasingly prominent features on mobile devices the mobile device and security system communicates via Bluetooth because a short-range-only communication system was desired. With the help of android mobile we can control task such as locking the doors, turning on/off lights remotely. According to kaue, home automation can be useful

to those who need to access home appliances while away from their home and can improve the lives of the disabled.

POWER

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- **VIN.** The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- **5V.** The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.

- **3V3.** A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- **GND.** Ground pins.

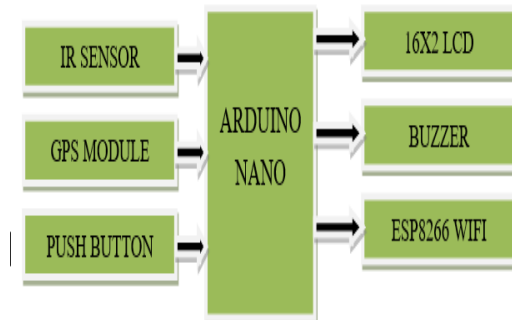
MEMORY

The Atmega328 has 32 KB of flash memory for storing code (of which 0,5 KB is used for the bootloader); It has also 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

INPUT OUTPUT

Each of the 14 digital pins on the Uno can be used as an input or output, using `pinMode()`, `digitalWrite()`, and `digitalRead()` functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kOhms. In addition, some pins have specialized functions

BLOCK DIAGRAM:



- **Serial: 0 (RX) and 1 (TX).** Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip .
- **External Interrupts: 2 and 3.** These pins can be configured to

trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the `attachInterrupt()` function for details.

- **PWM: 3, 5, 6, 9, 10, and 11.** Provide 8-bit PWM output with the `analogWrite()` function.
- **SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK).** These pins support SPI communication, which, although provided by the underlying hardware, is not currently included in the Arduino language.
- **LED: 13.** There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

The Uno has 6 analog inputs, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the `analogReference()` function. Additionally, some pins have specialized functionality.

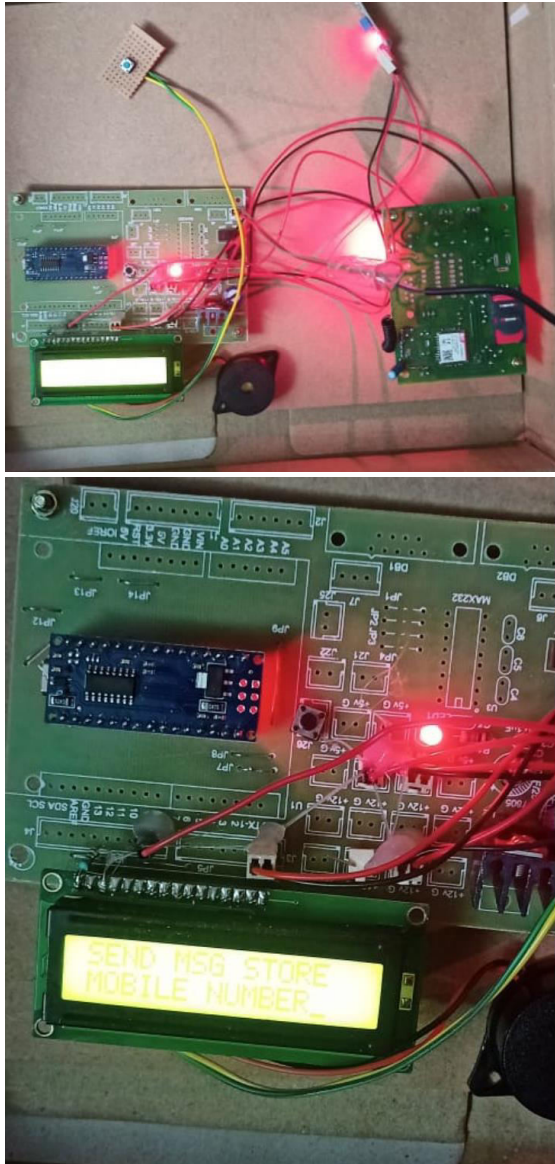
- **I2C: 4 (SDA) and 5 (SCL).** Support I2C (TWI) communication using the Wire library.

There are a couple of other pins on the board:

AREF. Reference voltage for the analog inputs. Used with `analogReference()`.

Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

Results



Conclusion

The project concludes that placing with the idol to be tracked which sends GPS data to blynk application. If the object being tracked moves out of its position, an alert notification will be sent to specified guardians through Global System for Mobile communication. Further the location of the object can be tracked whenever required through Global Positioning System. The Arduino Uno is a microcontroller board based on the

ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

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