

# “An Arduino Based Object Detector”

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**Abstract**— This paper includes various factors, including a design of a device that helps people to find their missing object. The proposed device has been implemented on the Arduino nodeMCU. The device consists of WiFi module and buzzer attached with it. This device is attached with any important object or the object which is small in size like keys, remote etc. and with the help of WiFi range and buzzer, one can find his object. The aim of this paper is to design a device which help the people in finding their objects and save their time.

**Index Terms**— Android Mobile Phone, Arduino Microcontroller, buzzer, battery, GPS controller.

## INTRODUCTION

An object finder is capable of locating any object which is missing and present in any suitable distance. In general, this project relates to the systems and devices for enabling persons to easily locate and find the lost or misplaced objects or items common to a household or office environment, and more particularly to a system utilizing a wireless transmitter and plurality of wireless receiver attachable to objects. [1]

“Object Finder Based on Arduino” is a hardware project used to locate the lost object using Wi-Fi range and buzzer to spot the object. The main objective of this project is to help the user in finding their missing objects. Their goal is to reduce the time it takes to find keys or other personal items. [2]

Locator system which would allow the user to track and find remote objects by pressing a button on the transmitting device, sending a signal over a wireless connection and triggering audio and visual signals on the receiving device (attached to an item), identifying the location of the remote item. [3]

Some key finders beep on-demand. The device is operated by the help of a web page which controls the functions of the buzzer attached to the device. The device can be operated offline i.e. without any internet connectivity or Wi-Fi.

## PROBLEM IDENTIFICATION

*Existing problem*—

It has been observed that, a lot of time is wasted in finding the objects once missed or sometimes it is permanently lost. The object once misplaced is very difficult to find even if it is somewhere near to us. Usually, we do not have such devices or trackers attached to our useful objects which can be made useful for searching them, once lost. Thus, this device is used for tracking the particular object to which it is attached and the exact location of that missing object can be identified.

## HARDWARE SPECIFICATIONS

### 1. NodeMCU

NodeMCU is an open source IOT platform. It helps you to mould your IoT product with ArduinoIDE or in Lua script lines. It is based on microcode which runs on the ESP8266 Wi-Fi SoC. The term "NodeMCU" refers to the microcode rather than the development kit. NodeMCU uses the Lua scripting language to program. It is based on the eLua project, and has a built in WiFi module. [4]

ESP8266 by Espressif Systems is a popular microcontroller chip available at low-cost with a full TCP/IP and Wi-Fi stack. A number of features are supported, making it easy to interface with different hardware to keep it online, making this inexpensive chip a prominent player in the emerging home automation and IOT space. [10]

### 2. Buzzer

A buzzer is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. General uses of buzzers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke. A piezoelectric component operated by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed. Piezo buzzers are used for making beeps, tones and alerts. [5].

### 3. Jumper Wires

A jumper wire is an electrical wire with a connector or pin at each end (or sometimes without them – simply "tinned"), which is used to connect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering. Each jumper wire is connected by inserting their "end connectors" into the holes given in a breadboard. [6-10]

#### 4. 6F22 9V Battery

The 9-volt battery, is a common size of battery that was established for the early transistor radios. It has a rectangular prism shape with rounded edges and a polarized snap connector at the top. This type of batteries is commonly used in walkie-talkies, clocks and smoke detectors. [7-15]

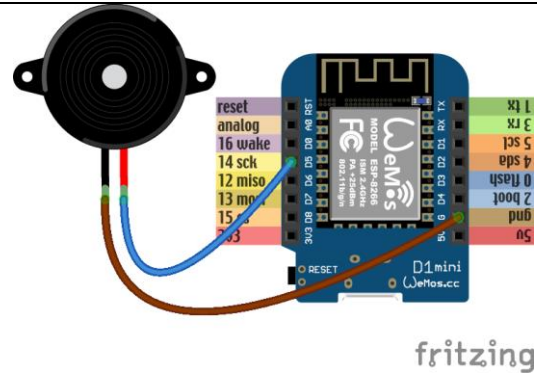


Figure 2. Connection of Buzzer [8]  
Interfacing of a buzzer or beeper with the esp8266 module.

#### BLOCK DIAGRAM

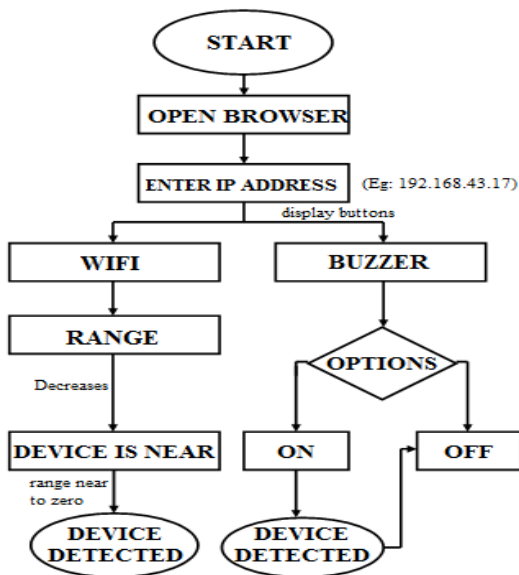


Figure 1.Process Flow Diagram

#### CIRCUIT DIAGRAM

Circuit diagram of the object Tracker consist of the following modules:

- 1.Arduino micro controller
2. Buzzer
3. Battery

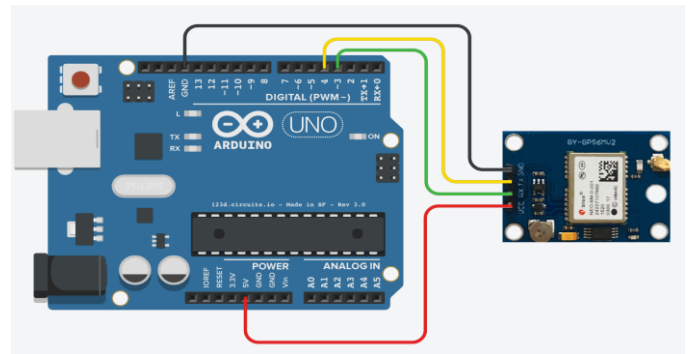


Figure 3.Connection of GPS module [9]  
Interfacing a GPS module with Arduino UNO.

#### DESIGN METHODOLOGY AND INTERFACING

People often misplace their gadgets and belongings. People could of course search their whole house putting it upside down to find the lost belongings mostly due to frustration and lack of time. Hence a tracking device which will be useful for all sorts of people who get frustrated when losing or misplacing their personal belongings especially electronic gadgets is essential. This proposed work presents a device model for tracking an object that interfaces with Android mobile devices. A GPS-GSM technology is integrated to the proposed work i.e., attached to a hardware component known as Arduino (UNO) to navigate and locate the lost item if it is out of a specified range. The purpose is to develop a tracking device which is useful for all sorts of people to identify the objects such as wallets, keys, pen drive, laptops etc. This will be useful to enable person to easily locate and find lost or misplaced object or items common to household and more particularly wireless transmitter and receiver is attached to an object. This tracking kit (Arduino UNO) has to be attached with the object and the android application that is developed plays a major role here. The input that is given through android application to the GPS Receiver is embedded to the Arduino board by selecting a particular object to be tracked. Once the input has been received the GPS will send the latitude and longitude position on which the searching object is located, to GSM. The GSM will act as an Input Medium and supports to transmit latitude and longitude position to the android application as input message.

### WORKING PRINCIPLE

The working of this system is to find the missing object by displaying the range of WiFi Module in the web page. After the connections are properly done, the buzzer gets the power and thus starts to sound, which shows that it is successfully working.

Now, the device which is connected with the interface is tested if the devices are operating with the interface controlling.

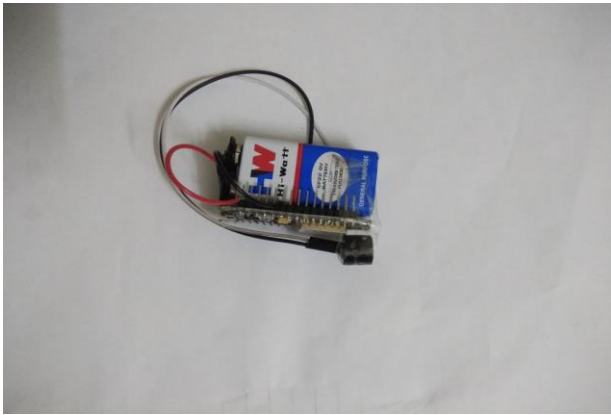


Figure 3. Object tracker Device



Figure 4. Tracker Device with object



Figure 5. Web Page Connection(WiFi)

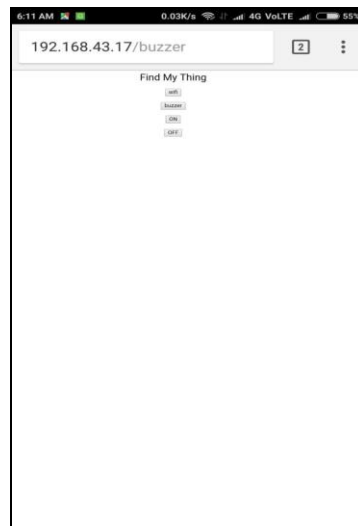


Figure 6. Web Page Connection(Buzzer)



Figure 7. WiFi Range

RESULT & ANALYSIS

When the device is tested after connections, it properly shows the range in the Web-App through Wi-Fi which indicates how far the device is from the system or phone.

TABLE I. TABULAR NOTATIONS

Range (in metre)	0-5	Up to 20	Up to 30
Time in Seconds	10	25.7	36

The above table shows the time taken by app to response on/off url according to the distance.

CONCLUSION

The objective of this project was to design and implement the object finder based on Arduino, to find the missing object. The device we made consists of Node MCU (esp8266), buzzer and battery. This device can be attached with the objects like keys, specs and any important thing, which is likely to be misplaced. For example, if the keys are often misplaced, we can attach our device to the key and can find them with the help of this device.

We can control the device from WebApp in which it gives the range of the device i.e. how far the object is available and we can switch ON or OFF the buzzer from the WebApp itself. On pressing the ON button in WebApp, buzzer produces a sound by which we can estimate where the device is.

This project can be very much useful in our daily routine, as we usually keep missing our important objects and it becomes very difficult to find it soon.

FUTURE SCOPE

- It can be made more compact.
- Different batteries can be used to make it work for a longer time.
- Distance measuring feature can be added to the project along with its location.
- GPS can be attached for increasing the scope of the detector.

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