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MOBILE DETECTOR SYSTEM IN EXAMINATION HALL

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Abstract*—This paper proposes a technology to detect a cellphone that is being used by a restricted user in a restricted area, and also show the location of the user, to prevent the user from continuous use of the cell phone. The right number is checked. However, it is often busy and takes time for an outsized number of scholars. Currently, instant communication is very possible all over the world due to a rapid growth in mobile phones technology. Each day, a number of mobile phone subscribers and cellular network coverage is escalating tremendously. Today's mobile phones are released with ability nearly to that of a desktop computer. The ubiquity nature of mobile phones and extended network coverage allows for constant connectivity, easy flow of information and accessibility. Students use mobile phones to store lecture materials, tutorials, communicate with colleagues and surf the internet for different purposes. These advantages would have adverse effects if mobile phones were brought in restricted premises such as exam venues. Disobedient candidates use mobile phones to cheat in exams. In this paper, we propose a systemprototype that will be used to detect mobile phones in the exam venues.

Keywords*—Microcontroller, Exams Cheating, Cell phone, Arduino duemilanove, IoT.*

1. INTRODUCTION

Today's mobile phones have increasingly become hi-tech. Mobile phones have storage capacity, Random Access Memory (RAM), Internal memory and Extended memory, Processing power (CPU), Wireless network connectivity (such as, Wi-Fi and Bluetooth), Built-in sensors, GPS, Camera and operating systems, just to mention a few. Mobile phones allow running of small computer programs (mobile apps), which provide a variety of features including; viewing and editing of text files in different formats such as word and pdf, instant charting, web browsers, dictionaries, scientific calculators and so forth. If used positively, a mobile phone is a good learning tool that allows students to move around with their learning materials (example, lecture notes, tutorials and ebooks), surf the internet (example, online help) and access installed apps for various uses. All these benefits would turn adversely if mobile phones were not restricted to be brought in during examinations. Most Universities have tried to explicitly state in their exams regulations that mobile phones are strictly prohibited in the examination rooms. The bylaw as it stands will not help unless there exists a mechanism to prohibit students from taking their mobile phones in exams. One of the existing approaches to ensure students are free of mobile phones in exams is through manual inspection during entrance.Manual inspection cannot reveal the presence of mobile phones all the time and therefore some students may go undetected. The hand held devices which ensures connectivity between a student sitting for an exam and outsiders have considerably increased a burden to invigilators of ensuring malpractices are not committed during exams. The motive behind taking mobile phones in the examination room by the desperate candidates is to illegally get access to answers, which is considered as cheating. Though cheating is considered as an infringement of exams regulations which would result in disqualification from studies, the Universities should not wait for this but rather to institutionalize a more improved technological approach to uncover students carrying their phones into exams. *Curran et al* suggested that, it is evident that counter measures are needed so as to fight against cheating with technology which is continuously growing. Thecapability of today's mobile phones gives a student numerous ways to cheat in exams. During exams period, a student may constantly communicate with fellows outside the exam room via Email and Short Messaging Services (SMS). Students and outsiders can exchange information (Questions and Answers) via email attachments. Through a mobile phone camera, a student can snapshot questions and send them as an email attachment to outsiders for help,

and in the same way students can receive answers. Moreover, as mobile phones provide internet connectivity, students can post questions online and receive responses instantly. In addition to that, students can post their queries to search engines and look for answers. Furthermore, with the storage capacity that mobile phones offer, students can pack lecture notes, books and any other unauthorized materials relevant to the exam in question on their mobile phones sometimes before exam period. Other applications installed in a mobile phone could also be used by a student to commit cheating; such applications include dictionaries and scientific calculators. As technology keeps advancing, likewise the students get access to multiple technologies to commit academic dishonesty.

The use of mobile phones is prohibited on college campuses and within the examination hall. Sometimes it's impossible to locate mobile phones with students. Detecting a mobile from this project will fix that problem automatically and therefore the alarm will ring automatically. The buzzer sound was detected within the project employing a graphicalLCD to detect centralized mobile identification and therefore the use of mobile phones within the examination hall and this information is shown on LCD. When we press the decision button on our mobile, the buzzer rings when theLCD is lit and therefore the call continues until both calls are connected and the signal transmission stops. RF detectors that use a tuned LC circuit to detect signals within the GHz waveband used on mobile phones isn't appropriate. Calculate the space between the detector and therefore the exact location within the exam hall, excluding faculty member's cell phones. Arduino may be a sort of microcontroller board that is used to design variouselectronic projects. It comes with 14 pins, which may be utilized in two ways: input or output. On board are Atmel microcontrollers, power supply and 6 analog pins.

USB ports for connecting to a private computer, integrated development environment, or pre-programmed microcontroller, want to write programs and upload them to the Arduino board.

2. HARDWARE DESCRIPTION

a. Arduino UNO Microcontroller

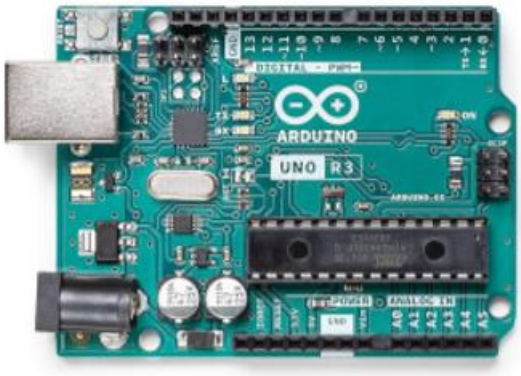

Fig.1

This is the brain of the detector system. It controls the other components and processes the input from the A88 detector. The **Arduino Uno** is an open-source microcontroller board based on the Microchip ATmega328Pmicrocontroller (MCU) and developed by Arduino.cc and initially released in 2010.[2][3] The microcontroller board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.[1] The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.[4] It can be powered by a USB cable or a barrel connector that accepts voltages between 7 and 20 volts, such as a rectangular 9-volt battery. It has the same microcontroller asthe Arduino Nano board, and the same headers as the Leonardo board.[5][6] The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available. abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have tobe defined.

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b. LCD Display

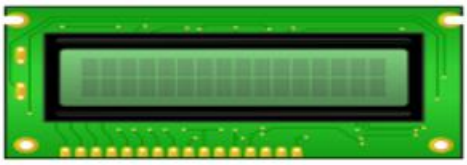

Fig.2

The LED display shows the status or strength of the detected signal. The Arduino controls what is displayed based on the input from the A88 detector. A liquid display (usually abbreviated LCD) may be a thin, flat display devicewhich will be placed ahead of a light-weight source or a reflector of any color or monochrome pixels. It's often utilized in battery-powered electronic devices because it consumes little or no power.

c. Battery

Fig.3

In this system it provides the power to the Arduino and, through it, to all other components. A battery is a device that contains more than one electrochemical cell that provides an external electrical connection, such as a flashlight, smartphone, or electric car. An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode. In Modern days we can also use rechargeable cells.

d. A88 Detector

The A88 detector is a module specifically designed for metal detection. It operates by inducing currents in metal objects and responding when it occurs. When the A88 detector approaches any metal, it makes a sound, signaling the detection of the metal. This is achieved through a process called non-contact metal induction detection.

Fig.4

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e. Buzzer

Fig.5

A signaling device commonly used to produce a buzzer or beeper sound. A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, trains and confirmation of user input such as a mouse click or keystroke. When the A88 detector senses a mobile phone, it sends a signal to the Arduino, which then activates the buzzer. The buzzer sounds an alarm to indicate the detection of a mobile device.

3. WORKING

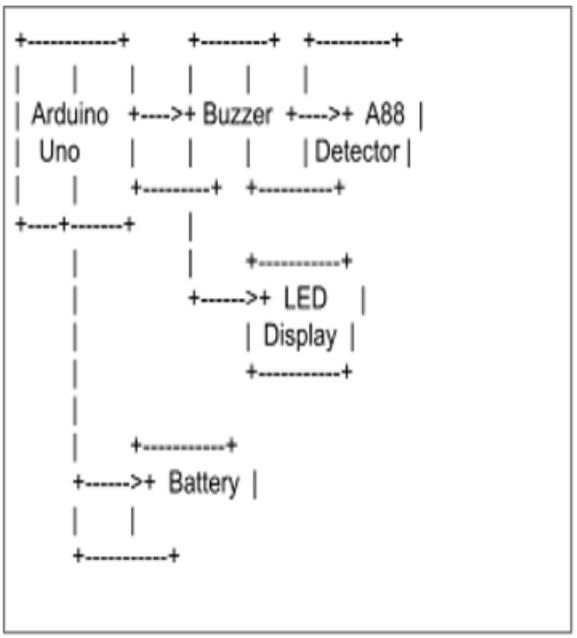

Fig.6 Block Diagram

A mobile detector system with an Arduino Uno, buzzer, LED display, A88 detector, and a battery connected through a breadboard operates as an integrated unit to detect the presence of mobile phones and alert the user. The Arduino Uno serves as the central processing unit, interpreting signals from the A88 detector, which scans for mobile phone activity. Upon detection, the Arduino triggers the buzzer to emit an audible alert and activates the LED display to provide a visual cue. The entire system is powered by the battery, and the breadboard facilitates the physical connections between these components, allowing for a modular and adjustable setup. The system's effectiveness relies on the seamless communication between the detector, the Arduino, and the output devices, ensuring immediate response to detected signals. The Arduino's programmability allows for customization of the detection parameters and the response behavior, making the system versatile for various applications. The breadboard's non-permanent setup also means the system can be easily modified or expanded in the future.

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The system works as follows:

- The A88 detector continuously monitors for specific signals that indicate the presence of a mobile phone.
- Once such a signal is detected, the detector sends a signal to the Arduino.
- The Arduino processes this signal and triggers the buzzer to sound an alarm.
- Simultaneously, the Arduino sends a signal to the LED display to show a visual indication, such as lighting up or displaying a message.
- The battery ensures that all components have the necessary power to operate.
- The breadboard allows for easy adjustments and changes to the circuit during the prototyping phase.

Here's a sample Arduino code for a mobile detector system using an Arduino Uno, a buzzer, an LED display, and an A88 detector. The code assumes the A88 detector outputs a HIGH signal when a mobile is detected. The LED display and buzzer are activated upon detection:

```
// Define the pin connections
int detectorPin = 2; // A88 detector connected to digital pin 2
int buzzerPin = 3;   // Buzzer connected to digital pin 3
int ledPin = 4;      // LED display connected to digital pin 4

void setup() {
  // Set the detector as input and the buzzer and LED as outputs
  pinMode(detectorPin, INPUT);
  pinMode(buzzerPin, OUTPUT);
  pinMode(ledPin, OUTPUT);
}

void loop() {
  // Read the detector's output
  int detectorState = digitalRead(detectorPin);

  // If a mobile is detected (HIGH signal)
  if (detectorState == HIGH) {
```

Fig.8

```
  int detectorState = digitalRead(detectorPin);

  // If a mobile is detected (HIGH signal)
  if (detectorState == HIGH) {
    // Turn on the buzzer and LED display
    digitalWrite(buzzerPin, HIGH);
    digitalWrite(ledPin, HIGH);
    // You can add code here to display a message on the LED display
  } else {
    // Turn off the buzzer and LED display
    digitalWrite(buzzerPin, LOW);
    digitalWrite(ledPin, LOW);
  }

  // Add a small delay to prevent reading too quickly
  delay(100);
}
```

Fig.9

4. Conclusion

In conclusion, the mobile detector system we're constructing is a practical application of electronics that combines various components to create a functional device. Utilizing an Arduino Uno as the central controller, it integrates an A88 detector for mobile detection, a buzzer forauditory alerts, and an LED display for visual notifications. The breadboard serves as the platform for connecting these components, providing a flexible and reconfigurable environment for prototyping. The battery ensures a portable power supply, making the system independent of external power sources.

This setup is ideal for learning about electronics, programming, and the principles of detection systems. It offers hands-on experience in building and coding for real-world applications. By assembling and programming this detector, you gain insights into the workings of sensors, signal processing, and output mechanisms. The project also highlights the importance of power management and the useof a breadboard for circuit assembly.

Overall, the mobile detector system is a testament to the versatility of the Arduino platform and its capability to bring together various electronic elements to create innovative and useful devices. Whether for educational purposes or practical applications, such a system demonstrates the power of combining simple components to achieve a complex functionality.

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