

The Use of Mobile Phones in University Exams Cheating: Proposed Solution

Ally S. Nyamawe^{#1}, Nixon Mtonyole^{#2}

[#]School of Informatics, The University of Dodoma
P.O. Box 490, United Republic of Tanzania

Abstract— 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 phones 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 will be brought in restricted premises such as exam venues. Disobedient candidates use mobile phones to cheat in exams. In this paper, we propose a system prototype that will be used to detect mobile phones in the exam venues.

Keywords— Microcontroller, Mobile Phone, Exams Cheating, Mobile Phone Technology.

I. 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 the few. Mobile phones allows running of small computer programs (mobile apps), which provide 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 e-books), surf the internet (example, online help) and access installed apps for various uses. All these benefits would turn adversely if mobile phones will not be 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 it 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 results to 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* [1] suggested that, it is evident that counter measures are needed so as to fight against cheating with technology which is continuously growing.

The capability 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 sends as an email attachment to outsiders for help, and in the same way student can receive answers. Moreover, as mobile phone provides internet connectivity, student can post questions online and receives responses instantly. In addition to that, student can post their queries to search engines and look for answers. Furthermore, with the storage capacity that mobile phone offers, 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 dishonest [2].

Cheating creates unfair competition amongst students in a class. Cheating interferes with some of the best qualities of education that an academic course of study normally encourages [3]. It is therefore important to always think and deploy new ways of combating emerging technologies that could potentially be used for cheating in exams. In this paper, authors are presenting a prototype that is based on microcontrollers and other technologies to detect Radio

Frequency (RF) signals emitted from mobile phones within the range of the examination hall.

II. LITERATURE REVIEW

The advancement and wide usage of mobile phones have promoted them to become the learning media. Therefore integration of mobile phones into instruction has increased in the Universities [4]. Despite of the vital role that is played by mobile phones as a learning tool, there still challenges that could emanate from using mobile phones such as cheating during exams and distraction during lecture hours. Onche et al [5] posit that, recently school authorities have noted the increase in the use of mobile phones by students to cheat during examination. With all the potential benefits that are offered by today's mobile phones, researches are still instilling the provisioning of mobile phones detectors in restricted areas. Taking into consideration that, some unauthorized users of mobile phones may not be uncovered by invigilators during examination, better equipment for detecting unauthorized usage of mobile phones during examination time is needed [6].

A novel mobile detector sensing alarming and reporting system developed by Mohan [7] had a pivotal role to detect mobile phones in restricted areas such as Prisons, Colleges, Hospitals and so forth. Through antenna, the device detects the presence of mobile phone and the signal is sent to PIC16F877A microcontroller which turns ON the buzzer circuit and sends the message to the LCD module for display and as well an SMS is sent to the registered mobile number via GSM module for notification.

An intelligent mobile phone detector designed by Mbaocha C. [8], was able to detect the presence of GSM signals emitted from a mobile phone within the radius of 1.5 meters. A device had a capability to detect calls, SMS and video transmission even though a mobile phone is in silent mode. Moreover, a device was able to restrict the detected mobile phone from accessing services through jamming which blocks the desired frequency. However, the device was unable to discriminate two distinct phones operating in the same frequency.

Kanwaljeet et al [9], developed a line follower robot designated to detect the use of mobile phones in restricted premises. Among other things, a robot is composed of a cell phone detector circuit which detects both incoming and outgoing calls, SMS and video transmission even if the mobile is in silent mode. When the robot detects RF signals transmitted from the mobile phone, it stops moving and sounds a beep alarm and the LED blinks for notification until

when RF signals transmission stops. However, the robot cannot tell the exact location of the detected mobile phone.

A mobile sniffer and jammer developed by Sujith et al [10] has a capability to detect the use of GSM mobiles in examination halls and other do not disturb areas. The sniffer circuit consisted of RF detector, GSM module and Peripheral Interface Controller (PIC). The device continuously detects the RF signal level and produces a warning message when the RF level increases.

III. SYSTEM DESIGN

The main purpose of the overall system is to detect the presence of mobile phone which is switched ON during entrance to the examination room. Detect and jam signals to any mobile device that can be switched ON thereafter during examinations. It detects the RF signals from mobile phones and relay a signal to the microcontroller which displays an alert to the invigilator and also triggers the jamming circuit to block the desired frequency for mobile phones. Figure 1 depicts a mobile phone detector.

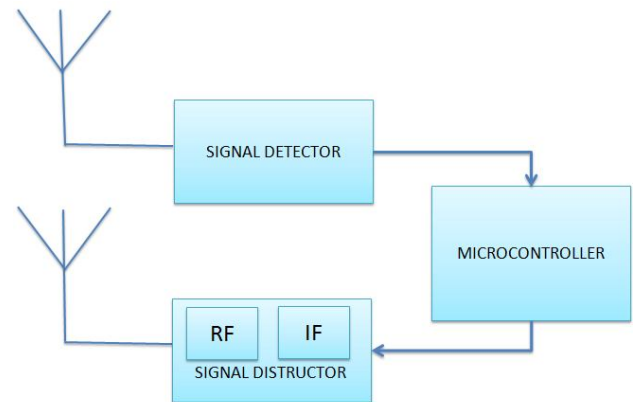


Fig. 1: Block diagram of mobile phone detector

A. Mobile Phone Detector

The basic principle behind this circuit is the idea of using a Schottky diode to detect the cell phone signal. Mobile phone signal is in the frequency range of 0.9 to 3GHZ. Schottky diodes have a unique property of being able to rectify low frequency signals, with low noise rate. When an inductor is placed near the RF signal source, it receives the signal through mutual induction. This signal is rectified by the Schottky diode and then sent to the Arduino Uno for further processing [11]. Figure 2 depicts a mobile phone detector circuit.

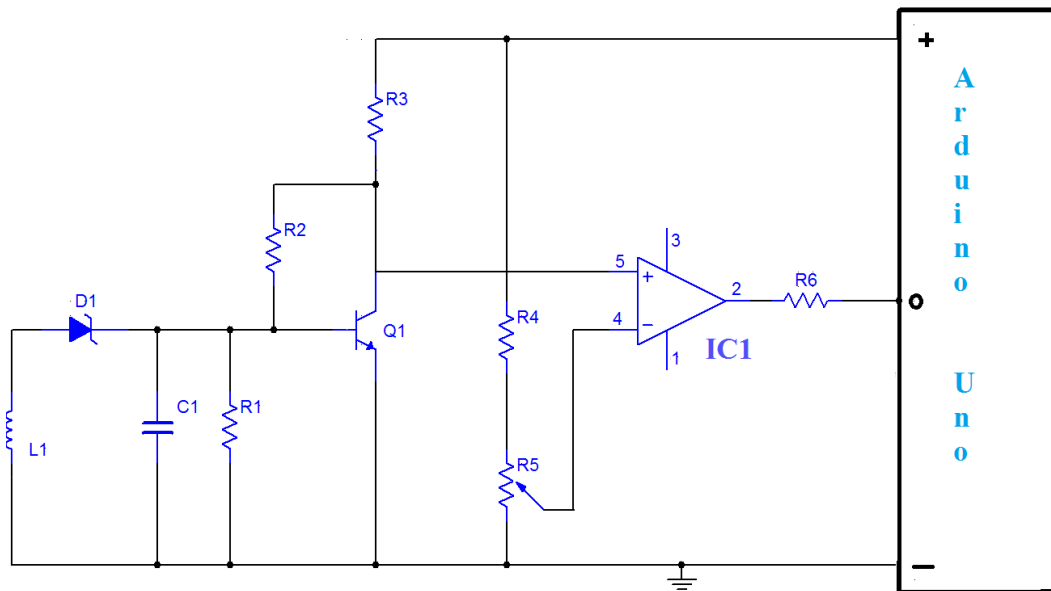


Fig. 2: Mobile phone detector circuit

Circuit Components:

- V1 = 12V
- L1 = 10uH
- R1 = 100Ohms
- C1 = 100nF
- R2 = 100K
- R3 = 3K
- Q1 = BC547
- R4 = 200 Ohms
- R5 = 100 Ohms
- IC1= LM339
- R6 = 10 Ohms

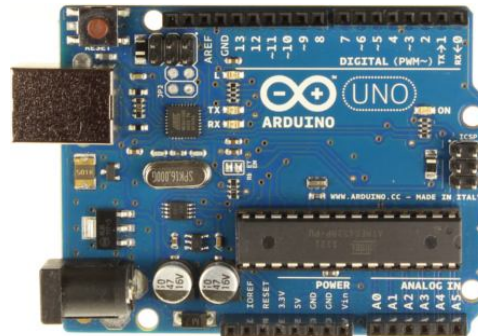


Fig. 3: Arduino UNO Microcontroller

The detector circuit consists of an inductor, diode, a capacitor and a resistor. Here an inductor value of 10uH is chosen. A Schottky diode BAT54 is chosen as the detector diode, which can rectify low frequency AC signal. The filter capacitor chosen is a 100nF ceramic capacitor, used to filter out AC ripples. A load resistor of 100 Ohms is used [11].

B. Arduino UNO Microcontroller

This device when powered is used as a source of power to both mobile phone detector and jammer. The device receives signals from the detector, sends information to the display to alert the invigilator and also activate the jammer device. Figure 3 depicts Arduino UNO Microcontroller.

C. Mobile phone jammer

As depicted in Figure 4, jammer circuit consists of three main important circuits when combined together. The output of that circuit will work as a jammer. The three circuits are RF amplifier, Voltage controlled oscillator and Tuning circuit [12]. So the transistor Q1, capacitors C4 & C5 and resistor R1 constitute the RF amplifier circuit. This will amplify the signal generated by the tuned circuit. The amplification signal is given to the antenna through C6 capacitor. Capacitor C6 will remove the DC and allow only the AC signal which is transmitted in the air. When the transistor Q1 is turned ON, the tuned circuit at the collector will get turned ON. The tuned circuit consists of capacitor C1 and inductor L1. This tuned circuit will act as an oscillator with zero resistance. This oscillator or tuned circuit will produce the very high frequency with minimum damping. Then both inductor and capacitor of tuned circuit will oscillate at its resonating frequency and hence jam the mobile signals [12].

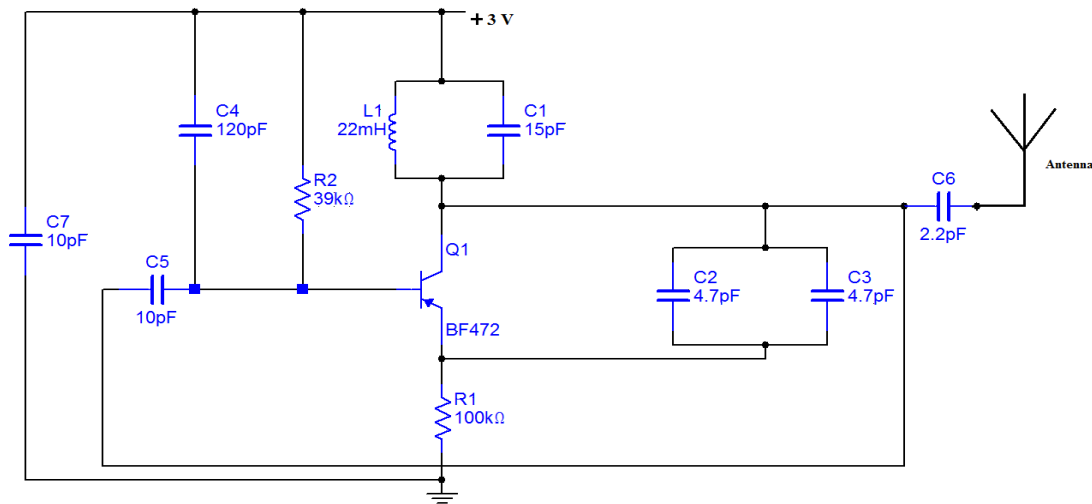


Fig. 4: Mobile phone jammer

IV. CONCLUSION

The widespread usage of mobile phones is continuously growing worldwide. Mobile phones are constantly becoming a daily necessity. Through mobile phones, it is very possible to convey large amount of information, store data, connect to the internet and communicate with friends through SMS, calling, Email and instant charting. Different sectors including; Education, Financial Services and Health rely on mobile phones as a way to deliver instant services. Improved features and functionalities promote today's mobile phones to save as the powerful instruction media and learning tool. With all these advantages that mobile phones could offer there still restricted premises in which the use of mobile phones should be strictly prohibited.

In Universities, mobile phones can be used for cheating in examinations. In this paper, authors proposed the prototype of a mobile phone sniffer that detects the presence of mobile phones in the examination hall. The sniffer is not only for detecting mobile phones during entrance but rather throughout examination time. This implies therefore that, the sniffer shall have an ability to detect active phones which fall within the radius of the examination hall. The detected mobile phone is jammed and the notification is given to the invigilator for appropriate action. To avoid an unauthorized use of mobile phones in restricted areas, the use of mobile phones detectors is therefore unavoidable.

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