CAMOUFLAGE IN MOBILE CASES USING ARTIFICIAL INTELLIGENCE

Prof. PAUL T SHEEBA [1], JAMA JANET M [2], SUMAYA BEEVI B [3]

Assistant Professor, Department of Computer Science and Engineering,

Loyola Institute of Technology, India[1].

Student, Department of Computer Science and Engineering, Loyola Institute of Technology, India [2,3]

ABSTRACT

Humans from of past have greatly observed nature and implemented them in various processes to support him .One among them is the concept of Camouflage. This does not mean the entire duplication of an object or organism, but rather a fooling mechanism in which the beholder is deceived of the coloration and appearance mimicked. Generally, a weaker organism mimics a stronger one .In this paper we have discussed a concept in which Mobile cases are camouflaged to obtain greater fun with technology. The Color sensors, Frequency Converters, ATMEGA Microcontroller, Common Cathode LED, rechargeable batteries and the like are being employed over here to convert the sensed signal as the desired output to be displayed in the Mobile Cases. It could even be controlled by an ANDROID APPLICATION from a Mobile Phone via Bluetooth. The proven result is highly reliable. As a consequence, the user takes the place of a Designer and pours out his creativity .Now a Common Man will have the power to dwell with his own creation and make a fashion statement on the go.

Keywords: Camouflage ,Color Sensor, Frequency Converter, ATMEGA Microcontroller, Common Cathode LED, Rechargeable batteries, Bluetooth.

1. INTRODUCTION

Man has been employing various means to carry out his tasks, since ages. Initially animals were trained to perform chores for which they were anatomically suited or made to adapt in order to help him .Every time he was in need of an improvised support.

Necessity being the mother of all inventions eventually led to the "Era of inventions". From this there evolved a better support system called an Electromagnetic machine or a Robot. The robots were trained only on basic movements, with the rise of technology the implication of robots also rouse up due to the introduction of a concept called Artificial Intelligence. This particular methodology is mainly adapted to train robots or feed them of their roles and purpose. Its usage being limited only by implication, the Defense sector stands no exception to it.

The concept of camouflage greatly admired in Mother Nature is being applied to mimic the coloration of an object so that it escapes predicted consequences or for fun loving technological products. Humans from of past employed various means to carry out his tasks .Initially animals were trained to perform chores for which they were anatomically suited or made to adapt in order to help him. Every time he was in need of an improvised support. Necessity being the mother of all inventions eventually led to the "Era of inventions" .From this there evolved a better support system called an Electromagnetic machine or a Robot. The robots were trained only on basic movements with the rise of technology the implication of robots also rouse up due to the introduction of a concept called Artificial Intelligence. It is the methodology adapted to train robots or feed them of their roles and purpose. Its usage being limited only by implication, the Defense sector stands no exception to it.

Robots can take any form but some even take the resemblance of human beings. To an extent this helps in replicating human behavior. Usually these robots attempt to exhibit speech, motion, cognition and the like and are called bio inspired robotics. Robots like TINA are being used the telecommunication sector [3].They are highly helpful in establishing a network between the operating sectors. Bots for the purpose of Defense plays a major role .It is used in Toxic gas detection, Mines detection and diffusion, Intruder detection etc. All these stand as evidence to the areas of application of these 'bots.

There are many instances where these 'bots have been camouflaged and employed for the purpose of surveillance and boundary detection [1].Many materials have been invented on the go, for example nylon strips that changes color, fabrics for army all over the world .With special mention to the Quantum stealth, a high level implementation of camouflage and Light bending techniques. Here the concept is carried out to forge satellites from the aircrafts hidden under the stealth. Automated spraying Robotic arms aid the industrial community to carry out the task of effective spraying with minimal loss [2]. The best examples of camouflage are exhibited in the Squid, octopuses and Cuttlefish .These organisms are thoroughly analyzed to find out the reason behind their color change. Chromophores are similar to color sacs, aid by contracting and expanding according to the sensed environment .A similar technique is carried out in all artificially carried out process.

The objects are forced to detect the surrounding color .Later they are made to reflect on these colors by changing themselves in accordance to it. By this way the entire method of Camouflage is being carried out.

The proposed methodology aims at combining the best of all these methods and retrieve out a versatile solution to camouflage the Mobile cases, in order that goods need not be produced over and over again .But could be produced only once and used over a period of time with longevity and style quotient. The cases if produced in this methodology will lead to an effective breakthrough in the field of Camouflaging. This is a proto-type of a larger idea of camouflaging

a real time Bio-inspired Robot ,that could be employed in the fields of Ecology, Surveillance of the habitats of Fauna, prevention of Poaching and related activities and the like.

A break through the glass ceiling could be made in the field of Self-healing or Renewable fabrics if this could be achieved in Fabrication technology .When devices of such methodology are up in the market, then it literally means technology in hands even to the lay man, in his own enjoyable way.

2. MOTIVATION

Any invention should have in mind the Last Man of the Pyramid .Only then it could satisfy a large mass of population .Most of the inventions fail in this criteria .The novice users find it very difficult to operate with high end devices or technology.

That is why we have aimed to take technology to the doorsteps of a common man, wherein he can enjoy and feel the real fun with technology .He/she can make a fashion statement while on the move.

3. METHODOLOGY

To implement the concept of Camouflage specific materials are chosen to carry out the process. One among them is through the usage of sensors and the other is based on an Android Application.

3.1 MODULE I

The following are the components of Module I.

SENSORS:

These are built with the ability to recognize color by identifying the accurate RGB value. This is carried out with the help of White LED and integrated RGB filters. Human eye perceives the light reflected from an object as its color .Based on this concept the intensity of the light is measured .These are programmed as the tolerance settings in the sensors .This particular capability is important when then sorting has to take place between similar colors.

Example: In Medical laboratory, sorting color pencils.

The input is the sensor connected to the Arduino via a circuit lead .The output is obtained through a LED that allows the Mobile cases to change colors temporarily or for fixed period of time .Like the Responsive chairs that would fade into the color of the person sitting on it.

TCS3200D:

The sensor used in this method and this outputs a square wave with frequency corresponding to light intensity and color .The frequency is expected to be in the range 2Hz to

500 KHz. This module can be applied to color sorting, environmental light induction and calibration, test strip reading, color matching test etc.

CONVERTER:

Electric current is being transformed by passing them through Frequency Converter .Here the level is set to produce the desired output.

MICRO-CONTROLLER:

A suitable micro-controller should be chosen .The ATMEGA microcontroller is selected for the process for its performance and effective power consumption. The main advantage of the Microcontroller over a Microprocessor is that, the controller is very User –Friendly.

OSCILLATOR:

It is the heart of the Micro-Controller. Pulses are generated to keep up the continuous working of micro-controller.

RGB LED:

Any signals after passing through the microcontroller are sent into the RGB LED, for further processing. It is here that the output is displayed.

POWER SUPPLY:

Overall power supply for this process is carried out with the help of high end batteries. This should be steadily done throughout the process. For the purpose of prototyping a 9 volt battery is being used.

3.2 MODULE 2

BLUETOOTH:

Mobile Case and the Mobile phone will be connected via. Bluetooth Technology. Range of Connectivity is up to 10m to 20 ft. (size of a room approx.).

A particular color or any combination could be chosen. Screen will sense and display the desired color.

TRANSISTORS:

A transistor will act like a switch .If the provided power supply is insufficient then transistor comes to the rescue by boosting up the current up to requirement.

PROTECTIVE RESISTORS:

Any damage to the Controller is prevented by the Resistor that melts upon passage of high current through it. Thereby the device is safe from damage.

MOBILE CASE:

A Case would be the region of camouflage visible to the user. All the circuits converge over here to provide a Visual Treat to the beholder.

3.3 BLOCK DIAGRAM:

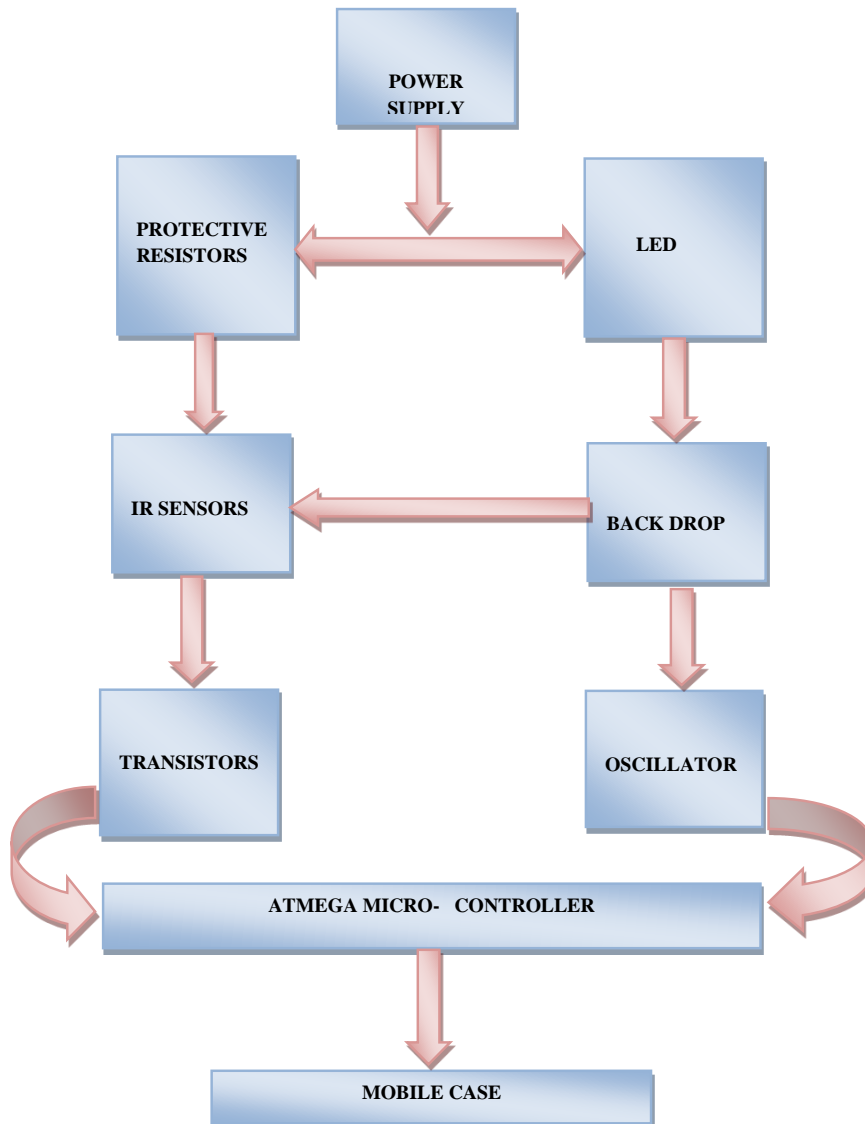The following is the Architectural representation of a Camouflaged Mobile case.

MODULE I:

Fig No.1Architectural Diagram of Module I

Initially Power Supply is provided to the kit either through Batteries or chargers plugged through ports. Capacity of them varies accordingly. Once charged up, surrounding colors are sensed by the IR SENSOR .All the detected signals are sent to the Micro-Controller and the color detected is made visible to the user through via LED Lights. Micro-Controller being the heart of User Interface is kept active with the pulses generated by the Oscillator. The Micro-controller has an upper hand because the process aims at enhancing User's choice. If a person has to fix the color of his choice he must simply pass his phone over the surrounding and it quickly transforms into his favorite color. All these activities are controlled by the circuit that acts for a particular duration and breaks the circuit connectivity later.
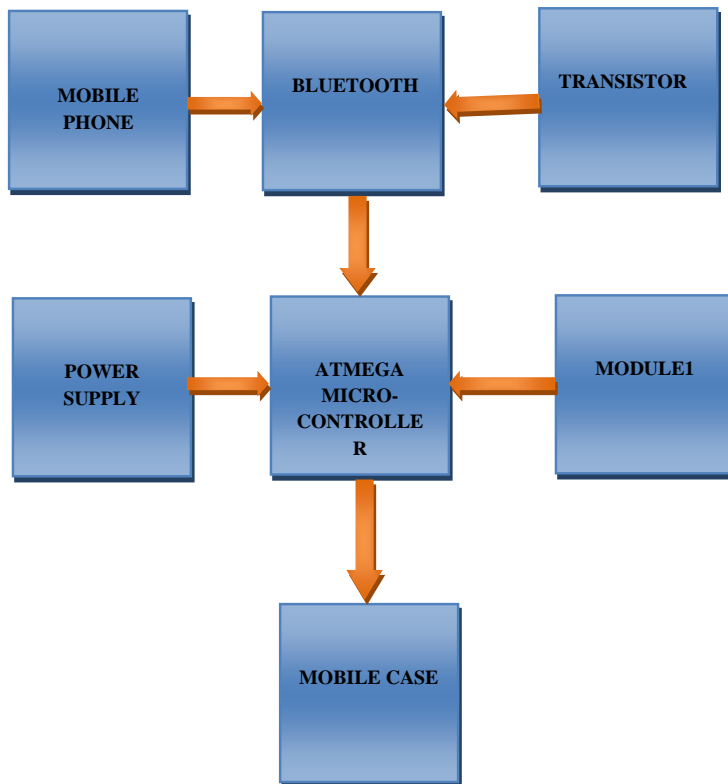
3.4 BLOCK DIAGRAM OF MODULE II

Fig no.2 Architecture Diagram of Module II

In Module II, the transformation is brought about with the help of an ANDROID APPLICATION. This provides a helping hand in case of failure of IR Sensors. Whenever the User needs not the surrounding color but his own he can simply choose and fix it up. Time Duration can be allotted for displaying a specific color. This is just an option. A User can avail the facility without allocating any Time Period to obtain perfect Camouflage of the Mobile

Cases. It can last up to particular period of time, an entire day as long as the User decides to keep it. Currently the Module Attachments are of considerable size .In near future its size could be made compact one or even provided as a built-in technology. With ongoing technical advancements many additional specifications could be added. As of now the model is a wired attachment to the Mobile case. Inputs obtained with the help of sensors are sent to the Frequency Converter for shaping into the appropriate Bandwidth. Thus the inputs will be processed and helps in converting the Mobile cases to the Flash with vibrant colors.

The World is to experience an outburst of technology due to 'CAI' technique. With further advancements this methodology could be applied to various materials like the strap of watches, frames of spectacles, on a piece of jewelry and the like. The major benefit is that the product is needed to be created or purchased only once with the camouflaging materials attached to it. Whenever required the materials can be made to change color in accordance with the environment or according to the choice of user. Thereby enabling a sense of fashion and creates a style statement for the user. Limits of creativity will reach new skies.

This is the entire view of using a Camouflaged product at the customer level. Prior to this such concepts were used only in Spy systems, Defense or high level Research etc. Now it has come to a level where it is no longer a secret but a common utility of a household. And this was what it is created for .There is no dearth that it will change the common man's perspective on technology.
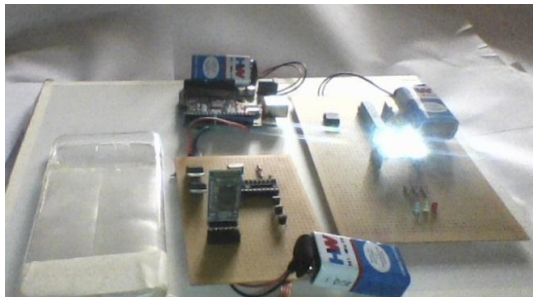
4. EXPERIMENTAL RESULT
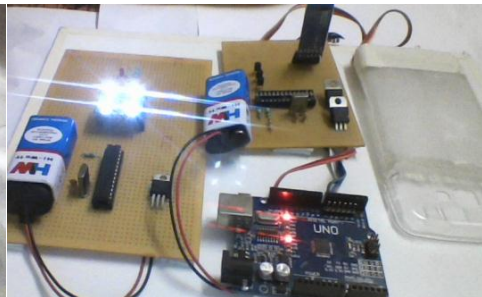

Fig no.3 Module I Activation   **Fig no.4 Module II Activation**
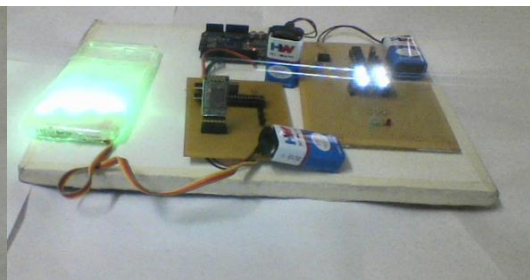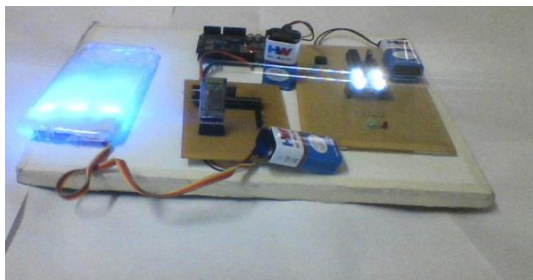
Fig no.5 Screenshot of Blue Camouflage   Fig no.6 Screenshot of Red Camouflage

Fig no.7 Screenshot of Red Camouflage

5. CONCLUSION:

The aim of the paper is to Camouflage a Mobile case using Artificial Intelligence. Here the case was made to sense its surroundings and display the corresponding color with precision not consuming much power of the device. Mobile Case in 'CAI' will recognize the surroundings with the help of high end sensors. A concept such as this was longed for and has now seen fulfillment. The Project has been undertaken from an Artist's point of view and has a long way to go. It has traversed across various whirlpools of constraints and now taken a stand in the Technical Arena. The concept is one that could be betted to change the perspective that the world had about Mobile Cases. The Coloration is made by detecting the surrounding, deciding on the bandwidth of the color and picking up the Largest Reflector, passing the Analog signal to the Mobile Case and performing the Camouflage.

6. FUTURE ENHANCEMENTS

The paper is just a beginning. As part of further development the following are suggested. The Cases could be developed with Nano particles to attain perfect crystal level camouflage. Liquid based color changing cases can also be develop but may not be suitable for hard surfaces.

The Cases can be specially manufactured by growing Stem cells on nervous systems. For this it is highly important to understand cephalopods and embryogenesis to develop Protein based bioelectric devices. The assaying patterns of the positive and negative fragments must first be analyzed and only then be implemented. Lithography based Micro Fluids can be processed and Multi layered dielectrics can be applied.

Non Resonant Meta materials, narrow planes and Three Dimensional lens could be applied to obtain a Real time view and even produce Invisibility effect to the device applied to. Later good materials can be developed and designed for application in watches, spectacles, jewelry etc. and make a fashion statement on the move.

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