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Self Defence and Monitoring Robot using IOT for Military Purpose

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ABSTRACT: This paper presents a modern way of looking at remote and border areas using a multi-functional robot based on the current IoT technology used in defence and military operations. The robot car has the ability to install solider in border areas for testing. The robot car acts as an independent and hand-operated vehicle using the Internet as a means of communication. Although there are many command robots, the demand for self-propelled robots is mounting for military purposes, often called unmanned aerial vehicles. Internet surveillance is used to monitor the Live Steams of Opponent Position and automatically activates the Protective System.

KEYWORDS: Arduino, ATMEGA328, Ultrasonic sensor, Wi-Fi module, Motor driver, Servo motor, IOT, Battery, and LCD display.

I. INTRODUCTION

1.1 SAFETY SYSTEM:

Actually a robot is an electro-mechanical device or gadget that is controlled by a PC system or by electronic means to perform various functions. With more and more innovative research, researchers are integrating impressive ideas with the design of robots. In this modern age of life it becomes the basic element of human life. The development of new equipment also provides the use of equipment in medical clinics, office and plants. In addition to the use of machinery, the use of Defence, Recreation, Investigation, Security Services and many other dangerous activities. As fear remains India's first enemies in these lines, the robots will use them to save human existence. Nations like India still face a lot of common risks from retailers. Both the terrorist attacks in Kashmir and Mumbai have concluded that far from the end the fighting will be controlled by robots and automatic machines to protect human lives. Over time, interest in military robots has grown exponentially. This has put part of the door open for returnees to develop more robotic robots. The need for self-propelled robots is due to psychological warfare and rebellious problems that humans face and fight. Extensive speculation is being made internationally to test new security structures equipped to protect residents from the dangers of depression; one such is the world's Unmanned Ground Vehicles (UGV). This has prompted our merger to create a model vehicle-controlled (UGV) model to embrace missions such as the father of the trolley, honor and war power both as an independent unit (organized) as in solidarity with the human military (manual). To make it understandable, a ground-operated vehicle that is too far away or without a human context to deliver route and dynamic orders is referred to as Unmanned Ground Vehicle (UGV).

1.2 INTERNET OF THINGS (IoT):

Internet of Things (IoT) is an organization of real objects or "objects" embedded in hardware, systems, sensors, and organizational objects, which enable these objects to collect and trade information. IoT allows objects to be accessed and managed remotely from an existing organization, setting open doors for direct joining directly between global and PC-based frameworks, and deliver improved performance, accuracy and financial benefits. "Objects," in the IoT sense, can refer to a variety of gadgets, for example, cardiac insertion, biochip carriers, aquatic fish, sensory vehicles, natural DNA research / food / testing microorganisms or gadgets field service work helps firefighters find and save jobs. These gadgets collect important information with the help of the various developments that exist and then independently disseminate information between the various gadgets.

II.EXISTING SYSTEM

- Node MCU control vehicle.
- Arm-controlled robotic arm.

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- Internet monitoring using web Cam.
- Obstacle Function.

All of the above activities are separate modules. We therefore incorporate the above methods into our module.

2.1 ROBOT VEHICLE SYSTEM:

The robot car system includes three stages. They are a module for Wi-Fi, Arduino, Motor driver and Motors. The Wi-Fi module is used to connect to the Internet for module kit. Arduino is connected to all parts of the components. The motor driver is used to control the dc motor. First, order the robot using the IoT web page, the Wi-Fi module receives the command. The order then passed to Arduino. Arduino reads the command and records the driver's result, and the car can run.

2.2 VIDEO MONITORING SYSTEM:

The video testing program consists of three stages. First a web cam system, a web cam system provides input into the monitoring system. The nature of the second web server, this section is where all data is collected and transferred to a PC or Android Application browser. The last section is a pc browser, this section can be used to view the effect of the embedded webcam.

2.3 ROBOT MONTORING SYSTEM:

The barrier system includes three systems. The first ultrasonic system, is a key part of the barrier system. The ultrasonic sensor is used to detect the object and to automatically use the arm of the defence robot. As self-defence is very important. We need to check the robot's immune system regularly. A motorist is used to control the DC motor.

2.4 ROBOT ARM SYSTEM:

The robotic arm system includes three systems. The first contains a Robot gun control setup. Instead of this system is used nodeMCU, Arduino, Motor driver and Servo motors.

III.PROPOSED SYSTEM

Node Control Car	- We have used this method in the robotic vehicle system. Using IoT for Motion Control Systems. Make Online
Web Server Controlled Robot	- We have used this method for Robotic right-hand control with a laser gun using IoT.
Online monitoring using webcam	- We have used this for live steam of current locations.
Obstacle work	- We have used this to activate the self-defence of the robot

3.1 BLOCK DIAGRAM OF ROBOT VEHICLE SYSTEM:

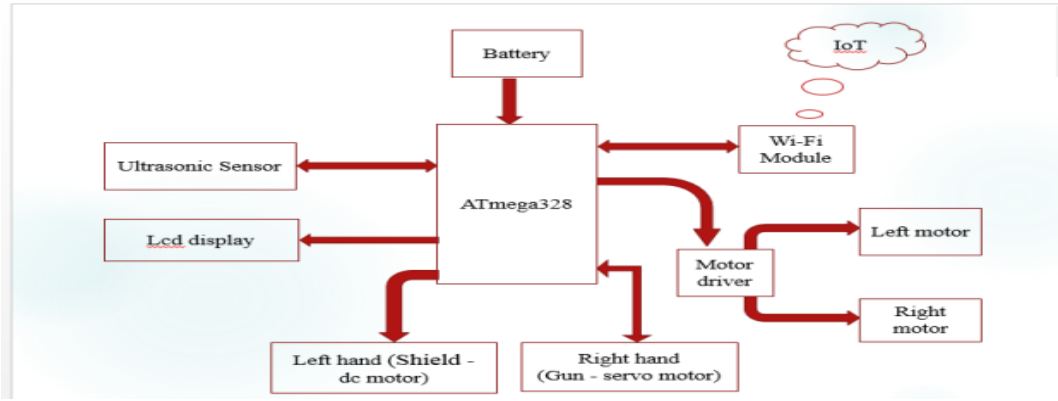

Fig.No.1 Block Diagram of robot vehicle system

In this paper to create a surveillance robot using IoT technology, we include the following hardware components- microcontrollers, ultrasonic sensors, servo motors for shields and guns, motor drivers, motors, LCDs and Wi-Fi modules. In this system we use Atmega328 controller. It is used to receive input data and to control a robot via

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the Internet. Ultrasonic sensors are used to detect an obstacle and the sensor signal is delivered to the controller. Controller sensors receive data and control the robotic arm for Armor. In this system the weapon is operated for the benefit of the attacker. If the user can see someone through the camera, we can attack the person who used the gun with a servo motor. Robotic circulation is controlled in left and right directions using a motor drive unit. The Wi-Fi module is used for communication between the controller and the IoT server. LCDs are used to display short messages for overall operations.

3.2 BLOCK DIAGRAM OF CAMERA MONITORING SYSTEM:

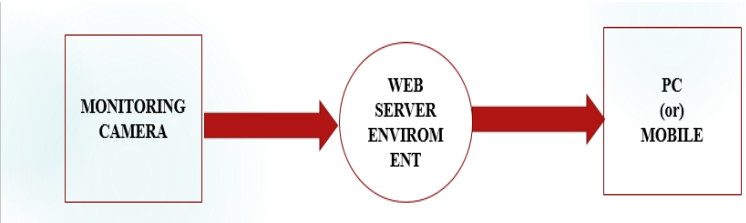

Fig.No.2 Block diagram of camera monitoring system

The user can monitor the Android application and PC webcam viewing software using the camera. The robotic vehicle system consists of three sections. First Wi-Fi module, Arduino, motor driver and motors. The Wi-Fi module is used to connect to the Internet in the project kit. Arduino connects all parts of the project. The motor driver is used to control the DC motor. First give the command to the robot using the IoT webpage, the command can be taken to the Wi-Fi module. The command then goes to the Arduino. The Arduino is read to generate a motor driver to write the command, then the motor can be run. We are using an IP camera that is connected to the mobile through the hotspot. Rotate 360 degree rotational movement of IP Camera. The camera can also be used for voice calling.

3.3CIRCUIT DIAGRAM:

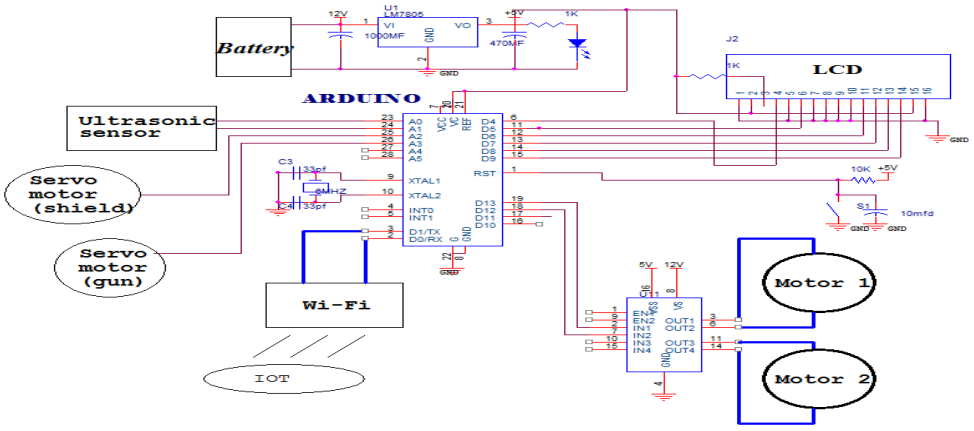

Fig.No. 3 Circuit diagram

The battery is used as a power source, which supplies all the components. The LM 7805 regulator is used to keep the voltage constant. Then the next capacitor is indicated, which is used to filter the unwanted AC component. The load becomes LED and resistor. If the LED voltage exceeds the 1.75V. If voltage limit, it drops on the resistor. This project uses the Atmega328 controller. It has 28 pins. The reset controller is connected to port 1 for reset purpose. The crystal oscillator controller is connected to ports 9 and 10. It is used to give a clock signal to the controller. The ultrasonic sensor controller is connected to ports A0 and A1. All the controls can be controlled by using of Arduino microcontroller. The driver we use is the L293D. This controller is connected to ports D12 and D13. Two motors are used to movement of robot vehicle. This driver is connected to 3, 6, 11 and 14 output ports. We used two servo motors for shed and gun control. This controller is connected to ports A2 and A3. The Wi-Fi module is connected to controller ports 2 and 3. It is used as a communication tool between the controller and the IoT. The LCD controller port is connected from D4 to D9. It is used to display short messages.

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3.4 PRINCIPLE OF OPERATION OF OUR WORK:

1. Initially, the power is given to the kit using two 6v batteries. Via the Wi-Fi module, kit is connected to a portable HOTSPOT of the same network Requirements.
2. Open the website link in the PC browser by giving the command to Robot, of using robotic functions such as moving the robot FORWARD, RETURN, ROUND THE RIGHT, and ROUND THE LEFT. We use Commands like LASER LIGHT ON, LASER LIGHT OFF and STOP ROBOT.
3. Ultrasonic Sensor will work automatically, when it detects an object. If any object found, Shield's hand will go up. Our kit module can be operated from anywhere in the world via Proper internet.
4. Camera Control Unit: Switch the Camera first then connect the power backup then connected to WIFI with Mobile Data for the same network requirements. The command can be given to the camera to rotate 360 degrees for monitoring.
5. The camera shows live streaming which can be viewed in our mobile. Similar to Media player for PC VLC, Manycam, Altercam and iSpy Software's can be used Show live streaming. By using the RTSP address link anywhere in Proper online.

IV. ROBOT MODULE KIT & HARDWARE DESCRIPTION

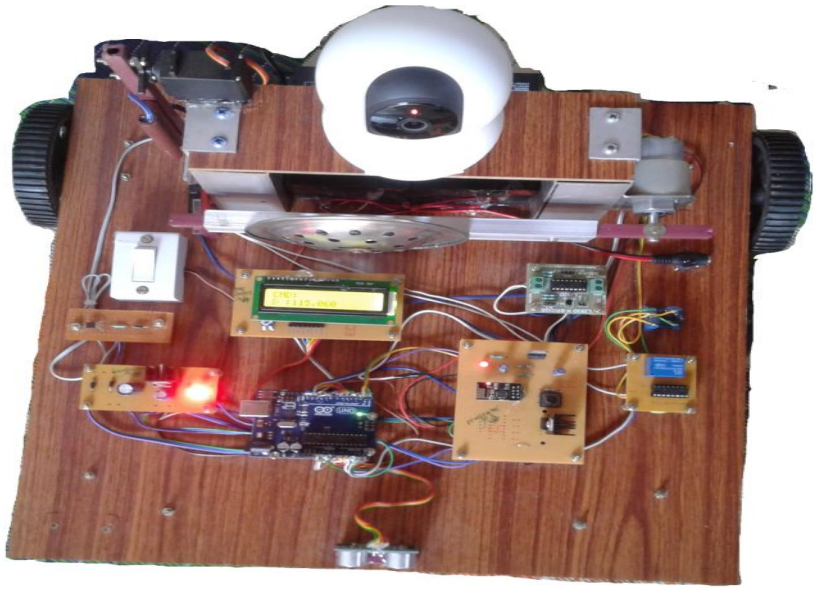

Fig. No. 4 Robot Module Kit

4.1 ARUDUINO -ATMEGA 328:

The ATmega328 is an 8-bit with 28 AVR Microcontroller pins, made by Microchip, follows RISC Architecture and has a 32KB flash system memory. I have EEPROM memory of 1KB and its SRAM memory is 2KB. It has 8 Pin of ADC activities, which include all the construction of PortA (PA0 - PA7). It also has 3 built-in Times, two of which are 8 Bit timers and the third is 16-Bit Timer. You have to be heard about Arduino UNO, UNO is based on the atmega328 Microcontroller. It works from 3.3V to 5.5V but usually we can use 5V as standard. Its excellent features include low cost efficiency, low power distribution, systems lock for security purposes, and real-time calculator with a separate oscillator. It is commonly used in installed applications.

4.2 Wi-Fi MODULE ESP8266:

The ESP8266 Wi-Fi Module is a self-contained System on chip (SOC) with integrated TCP / IP protocol a stack that can give any microcontroller access to your Wi-Fi network. The cheapest Wi-Fi microchip (ESP8266) along the full TCP / IP stack.

4.3 MOTOR DRIVER (L293D):

The L293D is an integrated circuit for the H-bridge motor driver integrated circuit (IC). Motorists act like Current amplifiers as it adopts low control signal and provides high - Current signal. This high current signal is used to

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drive engines. The L293D contains two built-in H-bridge driver circuits. In normal mode for Operation, two DC engines can be operated simultaneously, both front and rear Guidance. The performance of the motors of the two motors can be controlled by the logic of the installation on the anchors 2 & 7 and 10 & 15. Input logic which is 00 or 11 will stop the corresponding vehicle. Logic 01 and 10 will rotate it in clockwise and opposite directions, respectively enable pins 1 and 9 (corresponding to two motors) should be at the top of the motors start working. When the power input is high, the corresponding driver is enabled. Like Result, the effects are effective and work in stages by its input. Similarly, there Enable input is low, that the driver is disabled, and their results are turned off in the file State of high impedance.

4.4 ULTRASONIC SENSOR:

UTR (Ultrasonic Transmitter / Receiver) is a hybrid circuit that allows detection the ultrasonic detector adds a few foreign objects. Discovery based on amplitude variation of the obtained ultrasonic signal (40 KHz) due to the flow of the thing. Demonstrates stable electrical properties due to "Thick film hybrid" technology.Ultrasonic sensors have an acoustic transducer vibrating to the ultrasonic waves. The pulses are released by a cone-shaped beam and aimed at the target thing. The pulses indicated by the nerve target are obtained as echoes. Device it correct measures the time delay between each extracted heart and the echo to get it.

4.5 DC GEARED MOTOR:

The DC motor is converts the direct current into the mechanical work. It works on the principle of Lorentz Law, which states that “the current carrying conductor placed in a magnetic and electric field experience a force”. And that force is the lorentz force.

4.6 SERVO MOTOR:

A servo motor is one type of motor that can rotate with high precision. In our module, the servo motor can be used for shield operating purpose and activation of gun at particular angle.

V. OUTPUT OF IOT & LCD DISPLAY

5.1ROBOT CONTROL PAGE:

WebsiteLink:https://lzimvimi7awgdvrrrzraraon.drv.tw/site/SelfDefence.html

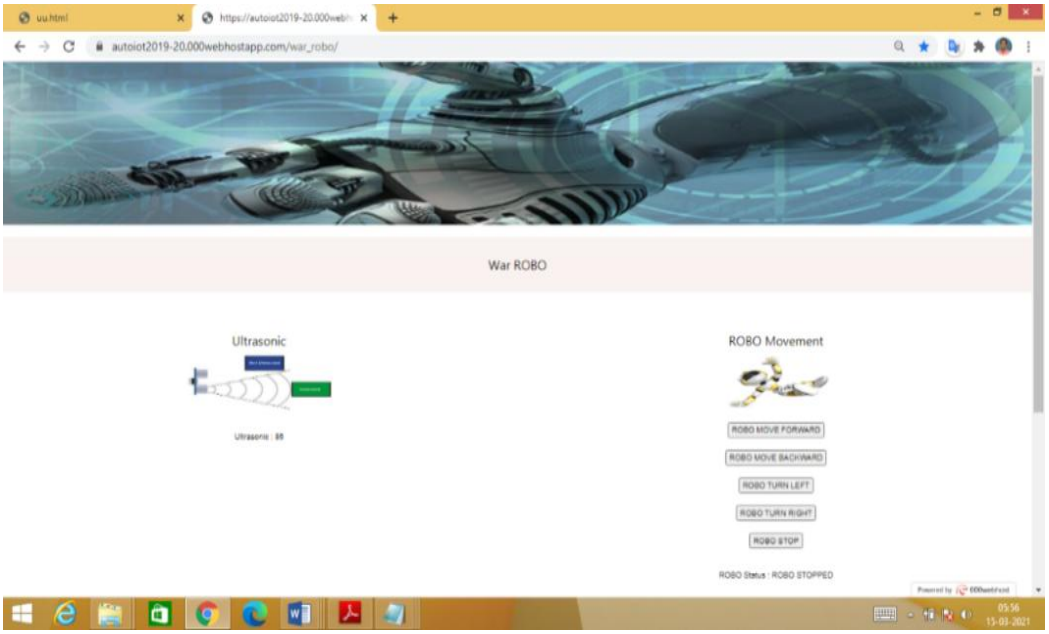

Fig.No. 5 Robot control website –first page-1

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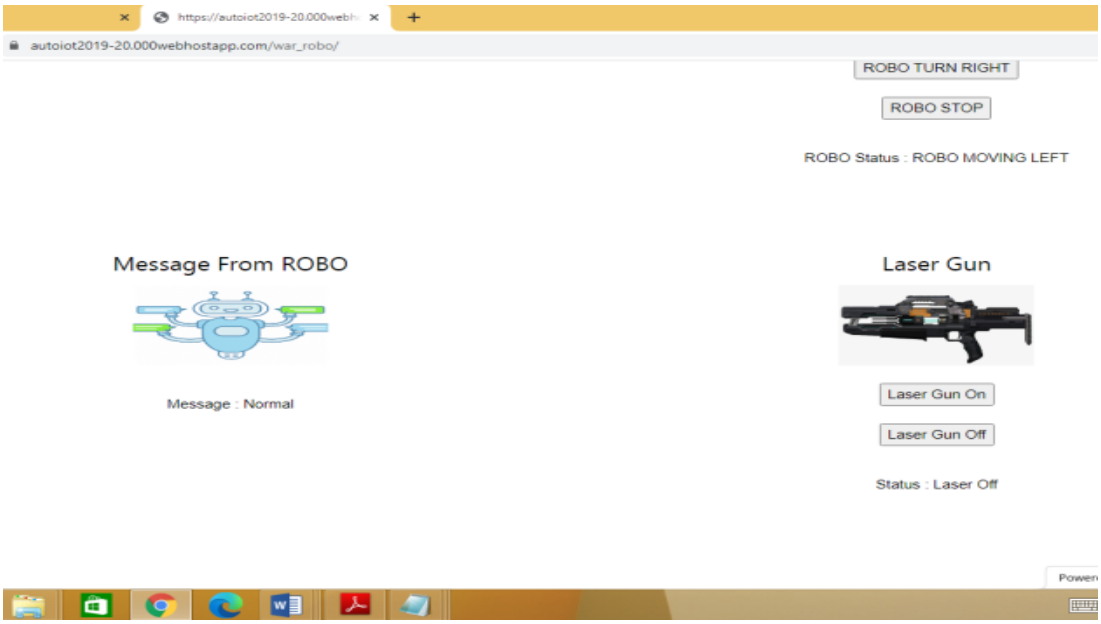

Fig. No. 6 Robot control website – second page

This page displays the picture of the ultrasonic sensor which is used in our hardware module and it shows the commands for the movement of the vehicle. We can move the vehicle in four directions namely forward, backward eft and right. This page shows the commands for the operation of the right hand of the robot. It has the commands like laser gun on and laser gun off. If we turn on the laser gun the right arm of the robot moves upwards pointing a laser light and if we turn off then it brings the right hand downwards to is its original position. These movement of upward and downward are done by using a servo motor.

5.2 OUTPUTS SHOWN IN LCD DISPLAY:

Fig. No. 7 Various direction of Robot vehicle in LCD Display

If we give commands like FORWARD/REVERSE/RIGHT/LEFT/STOP in the webpage using Phone or a laptop, then the command shows in LCD Display and robot vehicle operated as per given command.

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5.3 CAMERA MONITOR STREAMING:

Android Application Name :Tp – Link : Tapo camera app

Fig.No. 8 Android applications video stream system

As we are using a tapo camera, we can use their official app called as tapo camera app to connect the camera with the app and the fig 8 shows the exact image of the exact commands which can be used to control the camera. We can tilt this camera 360 degree for surveillance and it has option of voice calling to speak from both ends. The video and audio can be recorded and stored in the apps cloud storage and it can also be stored in camera using a memory card. Finally the camera plays the major role in the project kit as it is used for surveillance.

VI. CONCLUSION

This sort of shrewd robots is the future innovation which is utilized in military surveillance. By utilizing such robot, we can limit the danger to the life. Furthermore, save however much as could be expected human force, which we can burn-through elsewhere. In this venture we built up a savvy robot for military applications which give us observation on line zone. We can know the constant condition there and act further as per that. In this paper we carry out a savvy reconnaissance robot for military application with the assistance of this robot. We know the ongoing state of line zone without utilizing a human source. The observation robot gives us live real time video as per that we provide the orders.

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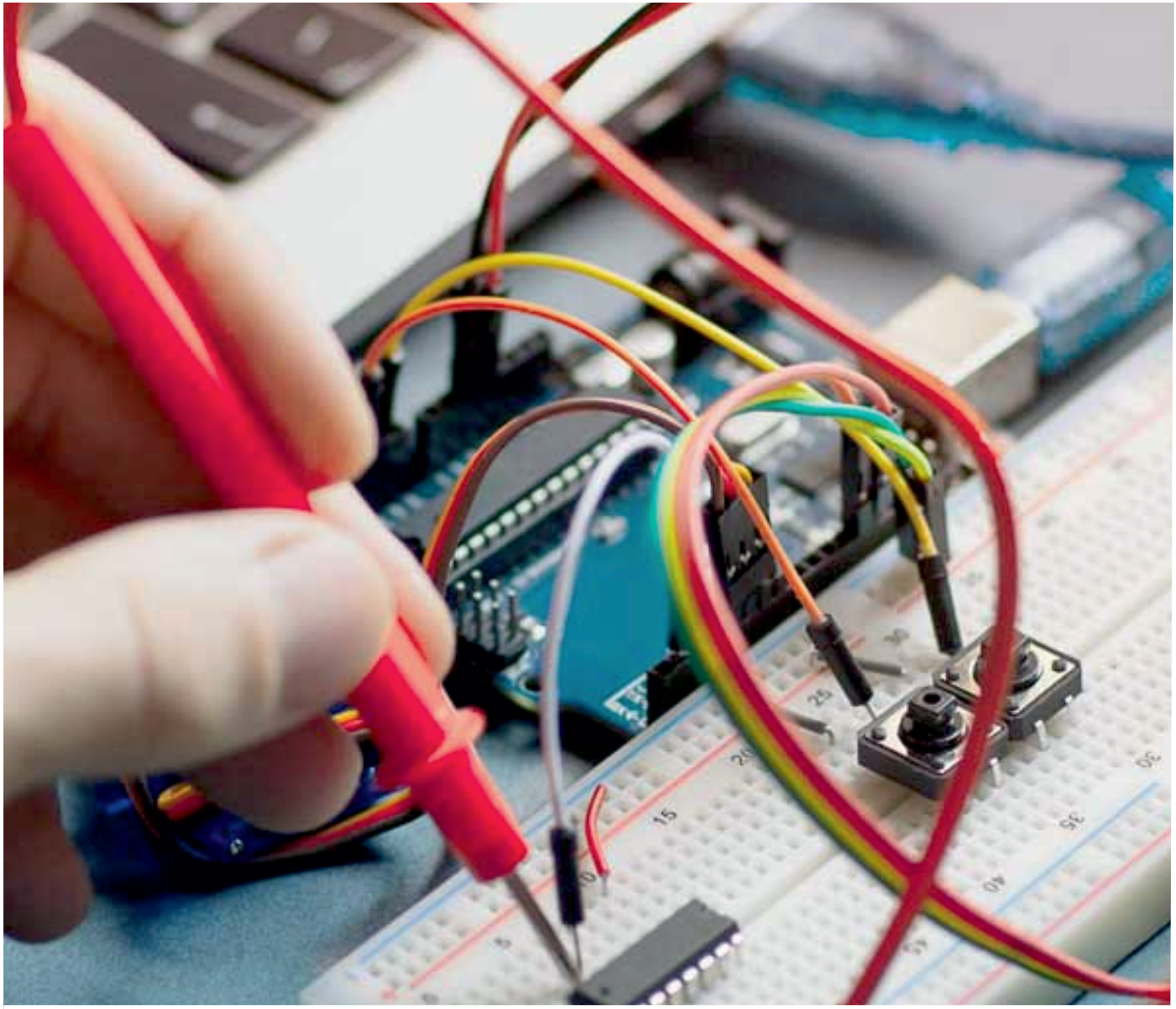

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