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# Wild Life Intrusion Detection Using Hanging Robot

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**Abstract:** Animals play an important role in ecology. Their existence is critical to the ecosystem's equilibrium. However, an increasing number of wildlife are becoming endangered and on the edge of extinction. As a result, humans designated forest areas (sanctuaries and national parks) as safe havens for these creatures to avoid extinction. However, numerous animals resulted in the death of poor health and a lack of attention. It is crucial to effectively and consistently monitor wild animals in the vicinity of the forest boundaries. Current forest monitoring technologies including satellite remote sensing, manned/piloted aircraft, and observation towers leave uncertainties about a wildfire's extent, behavior, and conditions in the fire's near environment, particularly during its early growth. Rapid mapping and real-time fire monitoring can inform in-time intervention or management solutions to maximize beneficial fire outcomes. In this system, an Android controlled robot is demonstrated to identify wild animals in order to protect them. To identify and observe the wildlife, we have implemented multiple sensors like temperature, fire detection, animal detection and toxic fume detection.

## I. INTRODUCTION

Observing wild animals in their natural environments is a central task in ecology. The fast growth of human population and the endless pursuit of economic development are making over-exploitation of natural resources, causing rapid, novel and substantial changes to Earth's ecosystems. An increasing area of land surface has been transformed by human action, altering wildlife population, habitat and behavior. More seriously many wild species on Earth have been driven to extinction, and many species are introduced into new areas where they can disrupt both natural and human systems. Reliable information about wildlife is absolutely important for making informed management decisions. The issues with the effectiveness of the control and monitoring of both large and small wild animals are relevant to assess and protect the world's biodiversity. Monitoring becomes part of the methods in wildlife ecology for observation, assessment, and forecasting of the human environment. World practice reveals the potential of the joint application of both proven traditional and modern technologies using specialized equipment to organize environmental control and management processes.

Terrestrial animals have low densities and wide habitats, so monitoring requires a tailored approach. Therefore, wildlife monitoring provides researchers with insights that can help them make conservation and management decisions to maintain diverse, balanced, and sustainable ecosystems in the face of these changes. Therefore, it is essential. All living things on earth have the same importance in the ecosystem. But today, the lives of wild animals are at risk. In the past, wild animals roamed freely in forests and jungles. If an accident occurs in the forest, the animals in the forest may even die from injury or disease. In these situations, it is not possible to determine the exact location of the animal over such a large area. Currently, the number of wild animals is decreasing due to industrialization and felling of trees in forest areas. Therefore, it is important to save the lives of wildlife within protected areas. Animals roam freely in the forest area without fear. For many years, these wild animals have been tracked using traditional methods such as the use of radio transmitter-receiver pairs. The radio transmitter is located on the animal's collar and the receiver is located on the forest ranger.

However, if the forest area is large and cannot be within range of a radio transmitter/receiver, the animal's location cannot be determined. Protected areas typically span hundreds of kilometers. Therefore, we need equipment that works even if the area of the protected area is hundreds of kilometers. A low-power microcontroller extracts information from data sequences received via Bluetooth. It also measures the temperature from the temperature sensor and sends this information to the modem. Data is transmitted via Bluetooth modem to the Forest Service or other

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government agency. The system we propose is designed to monitor wildlife intrusion. It also monitors the forest environment, such as temperature, fire, and gas parameters. The system will be implemented in portable and mobile format and tested in the field to confirm its effectiveness in real-world scenarios. The results of this project will be used to support conservation efforts by providing a cost-effective and efficient way to track and monitor wildlife. This project will have a major impact on wildlife conservation efforts by providing accurate, real-time data on wildlife populations and their movements. It also helps protect endangered species by identifying areas where they are at risk and enabling targeted conservation efforts.

## II. LITERATURE SURVEY

**2.1Q. Huang, A. Razi, F. Afghah, and P. Fule, ''Wildfire spread modeling with aerial image processing,'' in Proc. IEEE 21st Int. Symp. World Wireless, Mobile Multimedia Netw. (WoWMoM), Aug. 2020, pp. 335–340.**
We propose a new intelligent wildlife monitoring system. Based on the detection of salient objects, a convolutional encoder/decoder network is used to achieve progressive compression transmission and restoration of wildlife surveillance images, ensuring the transmission efficiency and quality of wildlife parts. Furthermore, to overcome the problems of high labor, low efficiency, and low recognition accuracy in classic manual screening methods, an improved and fast RCNN algorithm is proposed for automatic recognition of wildlife images.

**2.2 M. B. H., D. Janeera, and A. K. A.g, "Internet of Things based Wild Animal Infringement Identification, Diversion and Alert System," 2020 International Conference on Inventive Computation Technologies (ICICT), 2020.**
This study leverages the Internet of Things to provide a system to detect wild animal intrusion on farms through on-site monitoring. Ultrasonic sensors are deployed at the corners of the field to first detect the intrusion and capture images of the intruder with a camera mounted on an EV integrated with a node MCU microcontroller that monitors the field. Alert messages are sent to farmers via IoT applications. We analyzed the performance of the proposed system based on the images taken by the intruder and the notifications.

## III. EXISTING SYSTEM

Convolutional neural network (CNN) techniques and deep learning (DL) concepts can be used to identify wild animals when captured by a camera. As soon as an animal is spotted, farmers and surrounding forest authorities are alerted via LoRa communication, protecting wildlife and residents from dangerous situations. Therefore, this project requires a Raspberry Pi, a LoRa module, and an Arduino board on the receiving end. The technologies used in this paper are:
1. Computer Vision (OpenCV) - Extract features from images.
2. Machine Learning (ML) - To classify animals, a model must be trained under supervision.
3. Deep Learning - With the help of CNN, the cognitive ability is provided to classify the detected animals and analyze them according to this classification to generate the corresponding output. With sophisticated system design and 73 percent accuracy, revealed

## IV. PROPOSED SYSTEM

In this proposed system, we developed a wild animal observation system using a suspended robot with virtual support equipped with various sensors and a microcomputer. The proposed system includes a transformer, bridge rectifier, capacitor, voltage regulator 7812 and 7805, the transformer used here is a step down transformer used to step down the voltage from 230V AC to 12V AC It's a vessel. The output transformer is fed into a bridge rectifier. Among rectifiers, bridge rectifier is the most efficient rectifier circuit. Bridge rectifiers are used to convert 12V AC power to 12V DC power. The capacitor acts as a filter circuit that filters out noise and fluctuations in the power supply. A voltage regulator produces a fixed output voltage with a preset magnitude that remains constant regardless of changes in input voltage or load conditions. This system generates 12V and 5V voltages. The Arduino microcontroller and motor driver require a 12V power supply, and the sensors and modules require a 5V power supply. Each component requires a 5V or 12V power supply, and each component has power and ground connections. VCC and ground are connected to the power supply. And all the input pins are connected to the microcontroller. Our system is equipped with multiple sensors including: B. A temperature sensor to monitor ambient temperature and a PIR sensor to detect animal intrusion or movement. Flame/fire sensors are used to detect wild animal fire outbreaks. When this is detected, the motor driver turns on and activates the water motor, which acts as a fire extinguisher and extinguishes the fire. Gas sensors are installed to monitor the spread of toxic gases due to leaks and to detect the smell of decomposing animal carcasses. A buzzer will alert you if the threshold is exceeded or exceeded. The robot kit uses motors to move forward and backward

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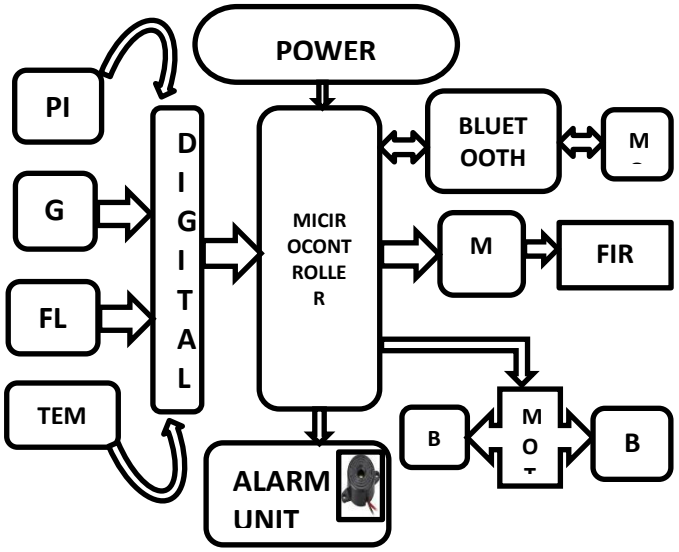
by giving commands through a serial monitor. Commands from the serial monitor are given by the user and data can be monitored using her Android phone connected to the robot via Bluetooth.

## V. PROPOSED BLOCK




## VI. SYSTEM SPECIFICATIONS

"Power" means a power supply. A device or system that provides electrical or other energy to an output load or group of loads is called a power supply unit or PSU. This term is most often used for power supplies, less often for machinery, and rarely in other cases. Power supplies for electronic devices are broadly divided into linear power supplies and switching power supplies. Linear power supplies are relatively simple designs, but they become increasingly large and heavy for high current devices. Voltage regulation in linear power supplies can reduce efficiency. Switching power supplies, which provide the same power as linear power supplies, are smaller and usually more efficient, but they are also more complex.

## VII. LINEAR POWER SUPPLY

AC powered linear power supplies typically use a transformer to convert the voltage from the wall outlet (mains power) to another (usually lower voltage). Rectifiers are used to generate direct current. A capacitor is used to smooth out the pulsating flow from the rectifier. Some small periodic deviations from the smooth direct current, called ripples, remain. These pulsations occur at frequencies related to the AC frequency (for example, 50 Hz or multiples of 60 Hz).
The voltage produced by an unregulated power supply varies with load and alternating current supply voltage fluctuations. In critical electronic applications, linear regulators are used to stabilize and regulate voltage. This regulator also significantly reduces output DC ripple and noise. Linear regulators often provide current limiting and protect the power supply and connected circuits from overcurrent. Adjustable linear power supplies are common test equipment for laboratories and workshops, allowing output voltage to be adjusted over a wide range. For example, a benchtop power supply used by circuit designers can be adjusted to output up to 30 volts and up to 5 amps. Some can be driven by external signals, such as applications that require pulsed output.

### TRANSFORMER

Motors convert intermediate currents from one voltage to another with little loss. Grinders only operate on stray

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power. This is one reason why mains power uses stray power. A stepper motor increases the voltage and a stepper motor decreases the voltage. Most electricity networks use step-down converters to reduce dangerously high mains voltages (230V in the UK) to safer lower voltages. The input coil is called the primary coil, and the related coil is called the secondary coil. Rather, they are connected by an intermediate attractive field produced in the engine's soft iron core. The two lines in the middle of the circuit symbol represent the core, and since the motor wastes very little power, the affiliate power is (approximately) equal to the input power. Note that as the voltage decreases, the current increases. The turns ratio (also called turns ratio) of each coil determines the voltage rate.

**RECTIFIER**

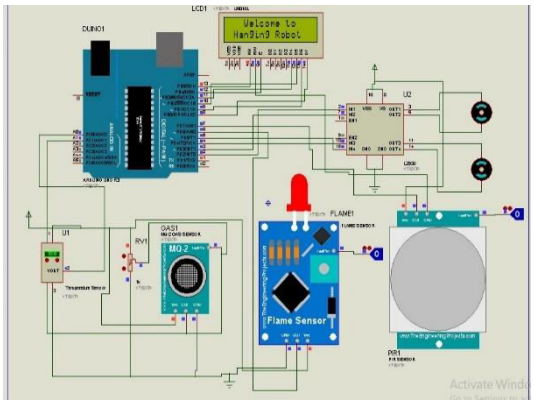
There are several ways to connect diodes to build an AC to DC rectifier. The bridge rectifier is the most important and produces full wave direct current. Using a center-tapped transformer, a full-wave rectifier can also be made with just two diodes. However, this method is rarely used today because diodes have become cheaper. A single diode can be used as a rectifier, but only the positive (+) portion of the AC wave is used to generate a half-wave DC current.

Bridge rectifiers can be made from four individual diodes, but they are also available in special packages with the required four diodes. It is called a full-wave rectifier because it uses the entire alternating current wave (both positive and negative parts). In a bridge rectifier, each diode dissipates 0.7V when conducting, and since two diodes are always conducting, 1.4V is dissipated, as shown in the diagram below. voltage in order for the rectifier to withstand peak voltages). For more information, including photos of ridge rectifiers, see our Diodes page.

**SMOOTHING**

Smoothing is achieved by a high-resistance electrolytic capacitor connected across the DC power supply that acts as a reservoir, powering the output when the fluctuating DC voltage from the rectifier drops. The graph shows the unsmoothed fluctuating DC (dotted line) and the smoothed DC (solid line). The capacitor charges rapidly near the peak of the varying DC current and discharges while delivering current to the output. Voltage regulator ICs are available with fixed (typically 5, 12, and 15 V) or adjustable output voltages. It is also rated by the maximum current it can pass. Negative voltage regulators are primarily available for use with dual power supplies. Most regulators have automatic protection against overcurrent ("overload protection") and overtemperature ("thermal protection").

## VIII. RESULTS AND DISCUSSIONS




**OUTPUT for HANGING ROBOT**

It looks like you are looking for information or help regarding hanging robots. Suspended robots are widely used in various industries for tasks such as painting, assembly, and material handling, and are suspended from hanging rails or structures to perform their tasks.

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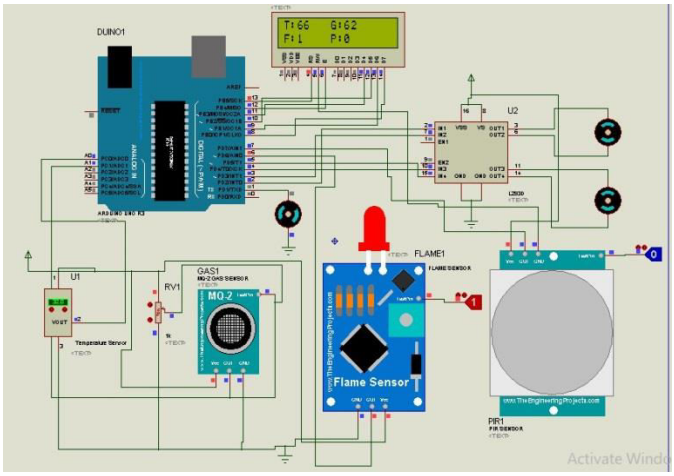
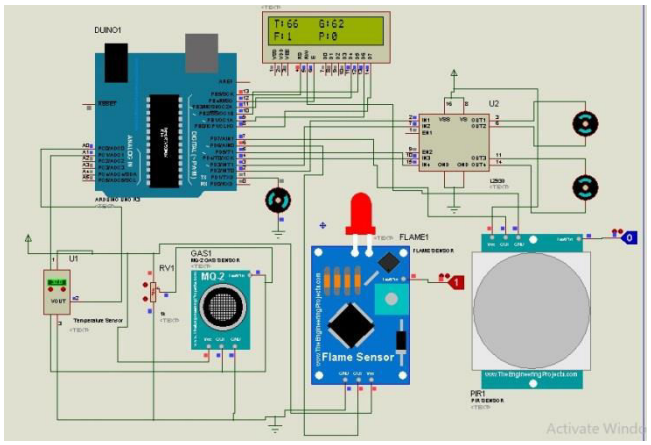


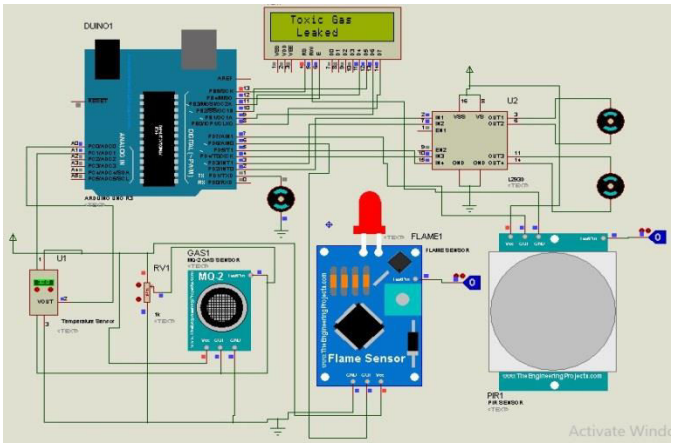

**TEMPERATURE OUTPUT**

Are you looking for temperature output in a specific context or for a specific purpose? Temperature output can be anything from a reading from a thermometer to a result displayed by a temperature sensor an output froma system indicating the current temperature. there is.




**FLAME OUTPUT**

Flame power generally refers to the visible flame produced during the combustion process. This can occur in connection with gas stoves, fireplaces, flashlights, or other fuel-burning systems. The appearance, size, and color of the flame provide information about combustion efficiency, the type of fuel being burned, and combustion conditions.




**GAS OUTPUT**

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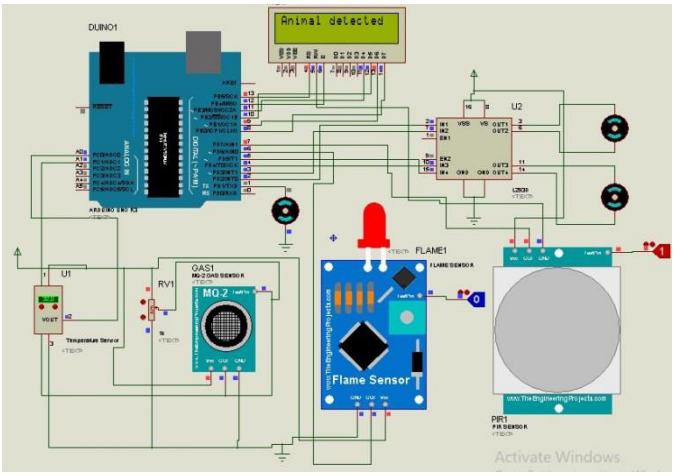
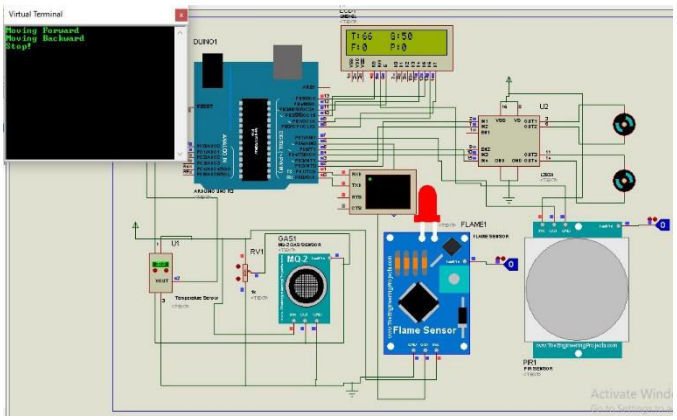
Are you referring to gas production in terms of energy production, industrial emissions, biological processes, or other aspects?




**PIR Output**

"P.I.R." often stands for passive infrared sensor, which is used in a variety of technologies such as motion detectors. The output of a PIR sensor typically refers to the signal it produces when it detects infrared radiation emitted by a moving object. This output signal is used to trigger actions such as turning on lights, sounding alarms, and activating security systems.




**ROBOT MOVEMENT STOPPED**

In robot motion control, target values are specified by joint variables in joint space or the position and orientation (posture) of an end effector in Cartesian space. The former is called the common servo control method, and the latter is called the Cartesian servo control method.

## IX. CONCLUSION

This system provides two ways to detect wild animals and helps monitor the environment for wild animals. Within the networked sensor design space are applications such as small animal tracking in wildlife telemetry. In this case, the nodes have very limited mass, energy, and power, so they can only convey the most basic information about their existence. The main advantages of our system are the ability to detect animals and monitor forest environments with higher reliability and/or wider range, improving performance and/or reducing costs (and improving safety and human life in harsh remote environments). risk). Animal tracking using wildlife telemetry. Wildlife monitoring is important for the effective conservation, sustainable use and scientific management of wildlife resources. Although much work is currently being done to build real sensor systems, there are few attempts to use them in the field and

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further maintain and develop them. The study of animals through this system for conservation can also be further extended to locate animals and monitor their health parameters.

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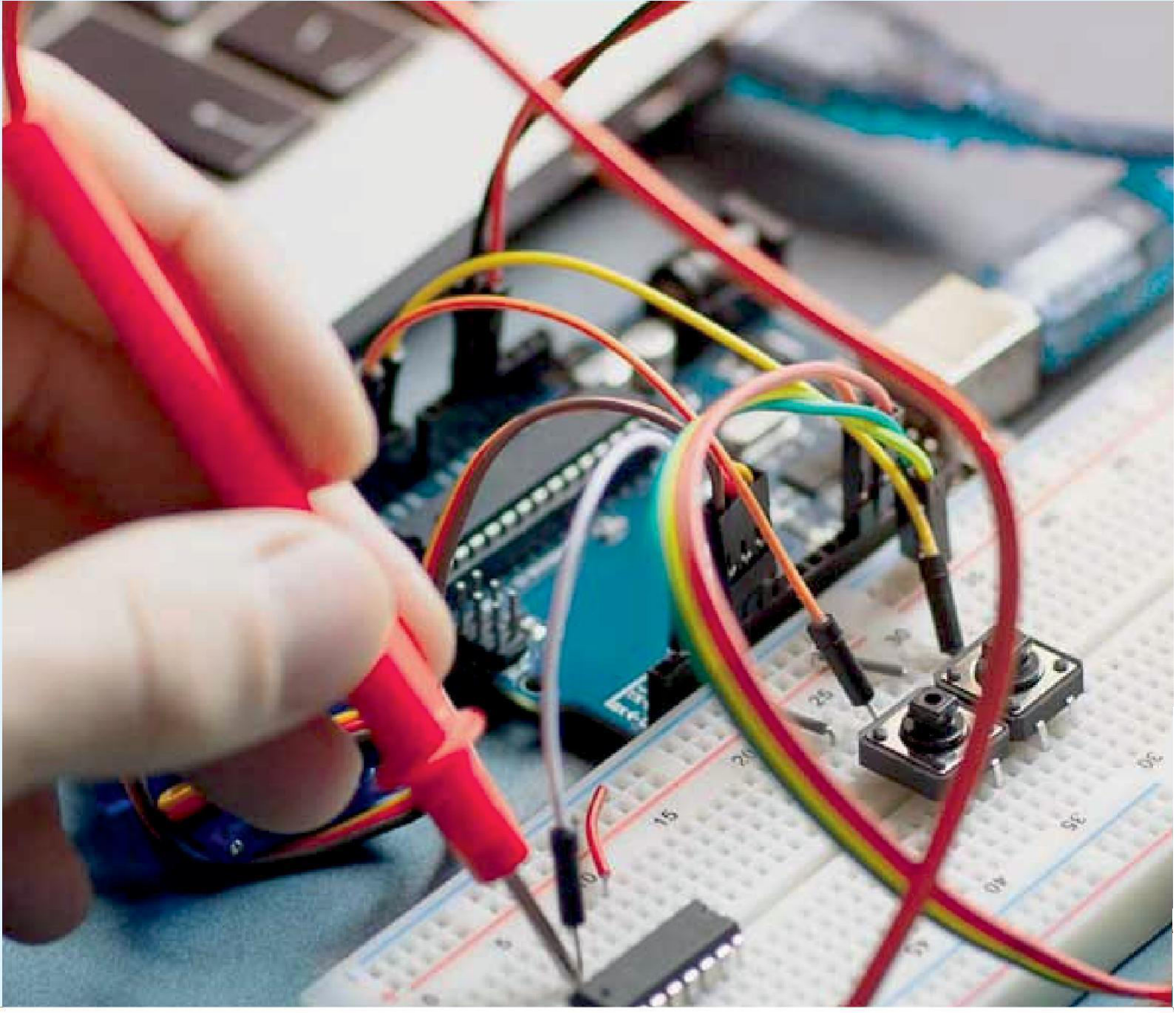

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