Abstract

Agriculture is the backbone of the economy but because of animal interference in agricultural lands, there will be huge loss of crops. This article provides a comprehensive review of various methods adopted by farmers to protect their crops. The project also discusses use of modern technology in agriculture.

Chapter 1

Introduction

Crops in farms are many times ravaged by local animals like buffaloes, cows, goats, birds etc. This leads to huge losses for the farmer. Due to over population, it occurs a deforestation this results in shortage of food, water and shelter in forest areas. So, animal's interference in residential areas is increasing day by day which affects human life and property causes human animal conflict but as per nature's rule every living creature on this earth has an important role in the ecosystem. Elephants and other animals coming into contact with humans, impact negatively in various means such as by depredation of crops, damaging grain stores, water supplies, houses and other assets, injuring and death of humans. So here we propose automatic crop protection system from animals. This is a microcontroller-based system using PIC family microcontroller. These systems use a motion sensor to detect wild animal approaching near the field. In such a case the sensor signal the microcontroller to take action. Traditional methods used by farmers are given below.

1.1. Electric Fences

Electric fences were used to control livestock in the United States in the early 1930s, and electric fencing technology developed in both the United States and New Zealand. An early application of the electric fence for livestock control was developed in 1936–1937 by New Zealand inventor Bill Gallagher. One of the major disadvantages of having an electric fence installed is that it requires regular maintenance. There are many rules and regulations involved, one that you need to check with local council to ensure even installing one is approved. Another is that you must constantly maintains the

surrounding plant life. If trees and grass are not properly trimmed back, they could be considered a fire hazard.

1.2. Scarecrow

Scarecrow genealogy is rooted in a rural life style. The Egyptians used the first scarecrows in recorded history to use to protect wheat fields along the Nile River from flocks of quail. Egyptian farmers installed wooden frames in their fields and covered them with nets. While traditional, motionless scarecrows do work against “pest birds” (e.g., crows and blackbirds), the effect is almost always temporary. Over time, the birds get used to stationary dummies and resume their destructive habits.

Motivation

The motivation behind this work was the lack of good farming facilities and technology around the world. There is an extreme shortage of a smart irrigation system in India, which also includes the lack of technology that is being involved in the irrigation system. Traditional farming system does not involve smart technology which makes the life of farmer very- very challenging in the fields.

Due to sudden rainfall in india sometimes it will lead to harm the harvested crop. So due to is reason we developed the embedded system.

Chapter 2

Literature Review

One of the major economic issues faced by the country is agriculture as this is the sector which is source of livelihood for about 54% of Indians till date. Still today this sector is not well developed and faces lots of problems resulting into low productivity of crops. As 43% of land in India, is used for farming but contributes only 18% of the nation's GDP. The poor condition of agriculture in the country is the point of concern for Indians. The rural farmers in India suffer from poverty and most of them are illiterate so there is lack of good extension services. The problem of wild life attack on crops i.e., crop Vandalization is becoming very common in the states of Tamil Nadu, Himachal Pradesh, Punjab, Haryana, Kerala and many other states. Wild animals like monkeys, elephants, wild pigs, deer, wild dogs, bison, nilgais, estray animals like cows and buffaloes and even birds like parakeets cause a lot of damage to crops by running over them, eating and completely vandalizing them. This lead to poor yield of crops and significant financial loss to the owners of the farmland. This problem is so pronounced that sometimes the farmers decide to leave the areas barren due to such frequent animal attacks Another major problem faced by Indian farmer is their dependency on nature and poorly maintained irrigation system. Current agricultural practice are neither economically nor environmentally sustainable and India's yields for many agricultural commodities are low. Poorly maintained irrigation system and almost universal lack of good extension service are among the factor responsible. Poor roads to market from village, rudimentary market infrastructure, and excessive regulation are few of the other concerned points for the agriculture sector in India.

The low productivity in India is a result of the following factor: According to World Bank's "India: Priorities for Agriculture and Rural Development", India's large agricultural subsidies are hampering productivity-enhancing investment. Over regulation of agriculture has increased costs, price risks and uncertainty. Government intervenes in labour, land, and credit markets. India has inadequate infrastructure and services. World Bank also says that the allocation of water is inefficient, unsustainable and inequitable. The irrigation infrastructure is deteriorating. Illiteracy, general socio-economic backwardness, slow progress in implementing land reforms and inadequate or inefficient finance and marketing services for farm produce. Very small (less than 20,000 m²) size of land holdings due to fragmentation, land ceiling acts and family disputes. Such small holdings are often over-manned, resulting in disguised unemployment and low productivity of labor. Illiteracy of farmers and their ignorance in the field of modern agricultural practices and technology, hampered by high costs and impracticality in the case of small land holdings. Inadequate Irrigation facilities and dependence of farmers on monsoon season, where good monsoon results in a vigorous growth while a poor monsoon leads to a sluggish growth for the economy as a whole. Ministry of Agriculture is also working in direction to improve the conditions of farmers by employing different programs like Insurance plan and ITC Limited plan. Under Insurance plan Agriculture Insurance Company of India insures farmers cultivating wheat, fruit, rice and rubber in the event of natural disasters or catastrophic crop failure, under the supervision of the Ministry of Agriculture. ITC Limited plan aims to connect 20,000 villages to the Internet by 2013 providing provide farmers with up-todate crop prices for the first time, which should minimize losses incurred from neighbouring producers selling early and in turn facilitate investment in rural areas.

Saranya, “Design and Fabrication of Solar Panel” [1] has presented construction of Solar tracking system using DC gear motor. A solar tracker is a device into which solar panels are fitted which tracks the indication of the sun across the sky confirming that the extreme amount of sunlight strikes the panels all through the day. The solar tracker will try to navigate to the best angle of contact of light from the sun. A detailed introduction to solar panel and solar tracker is described. Mostly the solar tracker is divided into two main classes, hardware and software. It is further sub divided into four main functionalities: method of Tracker Mount, Drivers, Motors, and Power supply of the solar tracker is also described. Parasnis, “New Method of Solar Tracking System” [2] has presented a new technique of automatic solar tracking system. Light dependent resistors (LDRs) are used to sense the strength of sunlight and hence the sun’s location in the sky. Microcontroller is used for monitoring the movement of solar panel. The appliance used geared DC motor to rotate the solar panel. DC motor are organized by the microcontroller with respect to signal from LDR.

AmanGarg, et al, “Concept of Mechanical Solar Tracking System” [3] reports a study of numeroussorts of solar tracking systems has been presented. To boost the overall effectiveness of solar panels by keeping them aligned along with the sun position, Solar tracking system is used nowadays. Solar tracking is one of the most suitable technologies so as to increase the efficiency of solar panels. Somewhat than purchasing additional solar panels, they can help to bind solar energy in more efficient way even with detail to cost.

TusharRaut, “Solar Powered Smart Fencing System for Agriculture Protection using GSM & Wireless Camera” [4] this paper presents how the solar energy supplied to the fence for crop protection from animals. A GSM module is used to alert the farmer about

any interference occurred in the farm.The advancement in science and innovation is a constant procedure. New things and new innovation are being created. As the innovation develops step by step, we can envision about the future in which thing we may involve each spot. The proposed framework dependent on Atmel microcontroller is observed to be progressively reduced, easy to use and less unpredictable, which can promptly be utilized so as to perform. A few dreary and redundant errands. In spite of the fact that it is structured remembering about the requirement for industry, it can reached out for different purposes, for example, business and research applications. Because of the likelihood of high innovation (Atmel microcontroller) utilized this "sun oriented fencing unit and caution for creature section aversion" is completely programming controlled with less equipment circuit.

Krishnamurthy B, “The Solar Fencing Unit and Alarm for Animal Entry Prevention” [5] has reported that the aim of this paper is to Design and implementation of an intelligent security system for farm protection from wild animals. An electric fence is used as a barrier to protect a farm from wild animals. An electric fence firstly used in Texas in 1888. Electricity from generator using an overshot wheel was used to charge the top two wires of a fourwire fence. Often solar-powered, the fences were used extensively in the Panhandle to prevent cattle wandering onto farmlands. It is important to keep the area near the fence cleared of any such vegetation. It should be ensured that the grounding has been done properly. Failure to do so might create the electric fence ineffective.

Dr. R. Ramaprabha, “Design of Power Converters for Solar Fencing System Employed in Agriculture”[6] has presented use of power converters for solar fencing system to be applied in agriculture. Wild animals destroys farmer's year of hard work in few hours.

Solar fencing can be used which the animals experience a high voltage low current shock for a very short time. This paper presents a design and analysis for fencing system for very low current, high voltage converters.

Tasneem Khan Shifa, "Moisture Sensing Automatic Plant Watering"[7] presents Automated plant watering system evaluate and measure the existing plant and then supplies desired amount of water needed for that plant. It minimizes the excess water used as well as keeping plants healthy. The increasing demand of food requires the speedy improvement in food production technology. In a country like India, where the economy is mainly dependent on agriculture and the climatic conditions, still we are not able to make full use of agricultural resources. The main reason is the lack of rains & scarcity of land reservoir water. Very important reason of this is due to unplanned use of water to which a significant amount of water goes to waste. So, in modern irrigation system, plants can be easily monitored and can be taken care of by automatic plant irrigation system.

EZEONU Stella Ogochukwu, "Ultrasonic Bird Repeller" [8] in this paper it is described about the ultrasound used for repelling birds from the farm area to reduce the loss in crops due to birds. Many attempts have been made to develop a bird deterrent systems with only a few achieved desired results. The ultrasonic frequency range 15-25 kHz is known to be disturbing for birds and a device operating at that range was developed. The devices were tested and the results obtained proved that the ultrasonic beam from the piezo speakers was able to drive birds away from areas. Further tests were conducted with the unit showed a wider reach of the waves on dull day than on sunny day. About 5-6 of device is expected to cover one hectare of field. The system is solar powered, to reduce the cost of fuel, it is eco-friendly.

Atul R. Dange, "Performance of solar power fencing system for agriculture" [9] in this paper Solar power fencing system provides control for all type of animal. The application suits remote areas providing an economical and practical solution to achieve maximum protection in field or areas. The stated solar power fence system works on the solar energy

the daily observation like solar radiation, panel voltage, panel current, battery voltage, fence voltage and current were noted and were plotted on graphs among these parameters. The average input/output energy from solar panel were found 172 and 23 watt respectively. Voltage in the fence live wiring ranges from 2 to 11 kV. The range of pulsating current through the fence wire was 0.005 to 0.008 Amp. Each pulse in the fence wire is for 0.0003 of second and pulses spaced about 1.0 seconds. One panel of 35 kW and 12 V battery was set up effective for 3.5 km fence line. As sunshine hours during day decreases and battery which is charged get discharged. As results fence wire voltage decreases which gives poor performance to control animals from entering farm. VenkatIyer, "Sensor-based Breakage Detection for Electric Fences" [10] presents how breakage is detected, there exists a number of fault detection circuits for fence that are available commonly. However, there are certain limitations for them which inhibit their suitability to our problem. For example, a system is described which is best used for less rugged environments such as airports. The fault detection system uses a hand held device which points to the direction where the fault is located. Workers must then cross along the fence holding the fault detection device until they found the fault location. This is the currently used method by the department of wildlife conservation in Sri Lanka, this fault finding procedure sometimes may take days. In this likely event of an elephant breach, such a delay can be harmful. These devices usually uses high impedance voltage dividers where the device get grounded through the user. Fault

detection system uses radio for communication, and are not viable because of effective low cost radios are not yet available commercially. The system describes uses a separate communication line parallel along with the fence, to detect faults. The system identifies the breaks in the communication line rather than in the wire itself. This solution is also not cost effective because it requires an extra wire dedicated for the fault detection. DavideAdami, "IOT Solutions for Crop Protection against Wild Animal Attacks" [11] this paper describes the synchronization among heterogeneous sensors and actuators interacting with cloud to provide a supporting platform for new services in the domain. In particular the peripheral part, a wireless technologies such as 6LoWPAN, WiFi, Zigbee etc., cooperating with the data center by an advanced IOT gateway. Another important feature that had considered is the lifespan of the device before placement. As such a selected low energy consuming bits equipped with batteries and solar panels for energy bring in, in order to achieve farm protection.

P. Rama Rao, "Protecting Crops from Birds, Using Sound Technology in Agriculture" [12] this presents the range of hearing defines the range of frequency that is heard by humans or animals, although it can also refer to the range of levels. The human range is from 20 to 20 KHz, while humans have significant difference, mostly at high frequencies, and the gradual loss of sensitivity to higher frequencies with age is considered normal. The sensitivity also varies with frequency. Normal transmission for hearing loss usually includes an audiogram that shows the threshold levels relative to normal. Several species of animals can hear rate of recurrence that go beyond the limit of human hearing. For example, some dolphins and bats can hear frequency up to 100,000 Hz. Elephants can hear at a range of 14-16 Hz, while some whales can hear infrasound sound up to 7 Hz (in water).

First of all, the number of birds is collective. Many farmers are using chains to harvest rice and wheat. Relatively a large number of grains obtained in this way are left behind in the field. This gives birds an ample and high-quality food supply that adds to the increase in numbers, and keeps it stable. Furthermore, many farmers are starting to plant rice through seeding rather than by transplanting. The sown seed is a resource of food for ducks if the paddy fields are swamped and for sparrows and pigeons if the fields are drained. In some cases, loss has occurred to first-hand crops. One example is the brown eared bulbul, which started to eat the leaves of various kinds of leafy vegetables. Bulbuls were once migratory birds, which overwintered in the southern part of Japan and raised in the hilly and northern regions of Japan. In the 1970s, these became yearlong residents and started to cause severe damage to winter cabbage and other leafy vegetables. In the case of Japanese pear, bird damage became worse .

Chapter 3

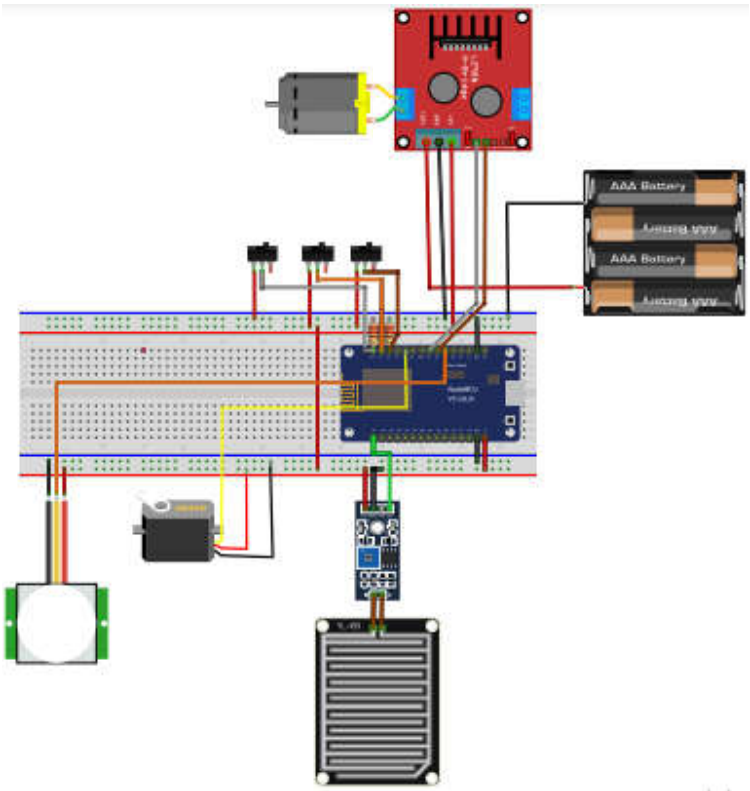
Proposed System

Block Diagram

Description

In these projects we used Node MCU as a microcontroller .Water sensor , and L293d motor , PIR sensor are used as input devices to node mcu. The servo motor is connected to the microcontroller as output device. The blynk app is connected to node MCU through IOT.

Circuit Diagram



Working

We are using node MCU ESP8266 as a microcontroller to program the project. When power supply on the microcontroller & other system modules will go on. The automatic shelter is used to convert the room roof. It will open closed based on the raindrop falls

on the rain sensor. It will detect & send commands which are already set in the system to close the shelter it will show on the blynk app. PIR sensor will detect birds or movement of birds this will give command the microcontroller to move scarecrow so that birds are move away .also we used fencing circuit which is placed around the project if any animal trying to enter in the farm they got schooled for few second & move away from electric fencing this will shows on blynk app. I.e animal is detected there is no danger for animal it will just little shocks.

Chapter 4

Component Details

Node MCU

NodeMCU Development Board Pinout Configuration

Pin Category	Name	Description
Power	Micro-USB, 3.3V, GND, Vin	**Micro-USB:** NodeMCU can be powered through the USB port **3.3V:** Regulated 3.3V can be supplied to this pin to power the board **GND:** Ground pins **Vin:** External Power Supply

Control Pins	**EN, RST**	The pin and the button resets the microcontroller
Analog Pin	A0	Used to measure analog voltage in the range of 0-3.3V
GPIO Pins	GPIO1 to GPIO16	NodeMCU has 16 general purpose input-output pins on its board
SPI Pins	SD1, CMD, SD0, CLK	NodeMCU has four pins available for SPI communication.
UART Pins	TXD0, RXD0, TXD2, RXD2	NodeMCU has two UART interfaces, UART0 (RXD0 & TXD0) and UART1 (RXD1 & TXD1). UART1 is used to upload the firmware/program.
I2C Pins		NodeMCU has I2C functionality support but due to the internal functionality of these pins, you have to find which pin is I2C.

NodeMCU ESP8266 Specifications & Features

- Microcontroller: Tensilica 32-bit RISC CPU Xtensa LX106
- Operating Voltage: 3.3V
- Input Voltage: 7-12V
- Digital I/O Pins (DIO): 16
- Analog Input Pins (ADC): 1
- UARTs: 1
- SPIs: 1
- I2Cs: 1
- Flash Memory: 4 MB
- SRAM: 64 KB
- Clock Speed: 80 MHz
- USB-TTL based on CP2102 is included onboard, Enabling Plug n Play
- PCB Antenna
- Small Sized module to fit smartly inside your IoT projects

Electrical fencing

Electrical power fence is an electrical fence. This system actively controls entry of animals and human beings by giving them a short, sharp but safe shock.

Features:

• Easy Construction.

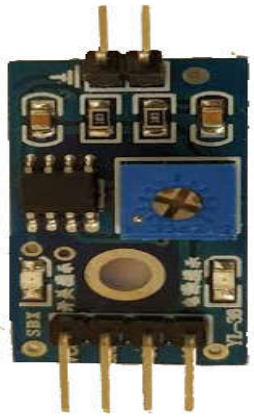
• Power fences can be erected to target species only.

• Low maintenance.

- Long lasting because of minimal physical pressure.
- All domestic and wild animals can be controlled economically.
- Makes strip grazing and back fencing easy.
- Encourages additional subdivision, giving increased production.
- Modification of systems to control a variety of animals is very easy.
- Aesthetically pleasing.
- Discourages trespassers and predators.
- Not harmful. It gives a short, sharp but safe shock to the intruder.
- Perimeter protection

Raindrop Sensor

Raindrop Sensor is a tool used for sensing rain. It consists of two modules, a rain board that detects the rain and a control module, which compares the analog value, and converts it to a digital value. The raindrop sensors can be used in the automobile sector to control the windshield wipers automatically, in the agriculture sector to sense rain and it is also used in home automation systems.



Pin Configuration of Rain Sensor:

S.No:	Name	Function
1	VCC	Connects supply voltage- 5V
2	GND	Connected to ground

3	D0	Digital pin to get digital output
4	A0	Analog pin to get analog output

Raindrop Sensor Features:

- Working voltage 5V
- Output format: Digital switching output (0 and 1), and analog voltage output AO
- Potentiometer adjust the sensitivity
- Uses a wide voltage LM393 comparator
- Comparator output signal clean waveform is good, driving ability, over 15mA
- Anti-oxidation, anti-conductivity, with long use time
- With bolt holes for easy installation
- Small board PCB size: 3.2cm x 1.4cm

Applications of Rain sensor:

- Automatic windshield wipers
- Smart Agriculture
- Home-Automation

Servo Motor SG-90

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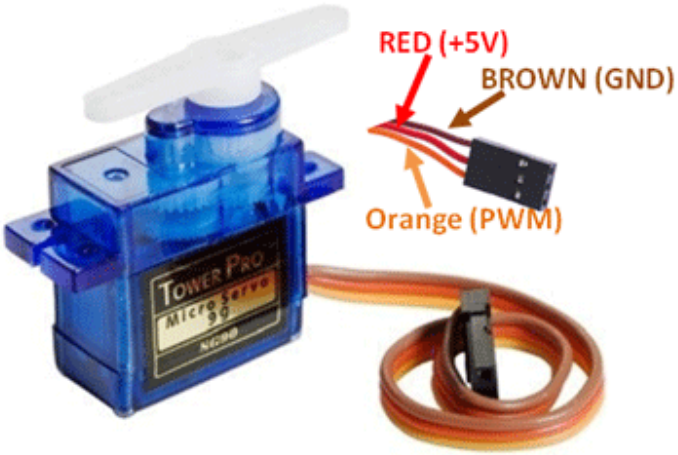

- **SG90 Servo Motor**

Servo Motor Pinout (Wires)

Servo Motor Wire Configuration

Wire Number	Wire Colour	Description
1	Brown	Ground wire connected to the ground of system
2	Red	Powers the motor typically +5V is used
3	Orange	PWM signal is given in through this wire to drive the motor

TowerPro SG-90 Features

- Operating Voltage is +5V typically
- Torque: 2.5kg/cm
- Operating speed is 0.1s/60°
- Gear Type: Plastic
- Rotation : 0°-180°
- Weight of motor : 9gm
- Package includes gear horns and screws

HC-SR501 PIR Sensor

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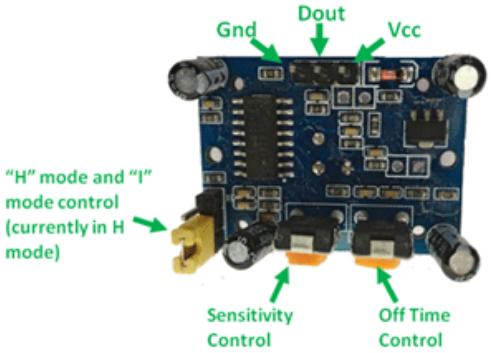


- **HC-SR501 PIR Sensor**

PIR Sensor Pinout

The PIR sensor stands for Passive Infrared sensor. It is a low cost sensor which can detect the presence of Human beings or animals. This **HC-SR501 PIR sensor module** has three output pins Vcc, Output and Ground as shown in the pin diagram above. Since the output pin is 3.3V TTL logic it can be used with any platforms like Arduino, Raspberry, PIC, ARM, 8051 etc..

PIR Sensor Module Pinout Configuration

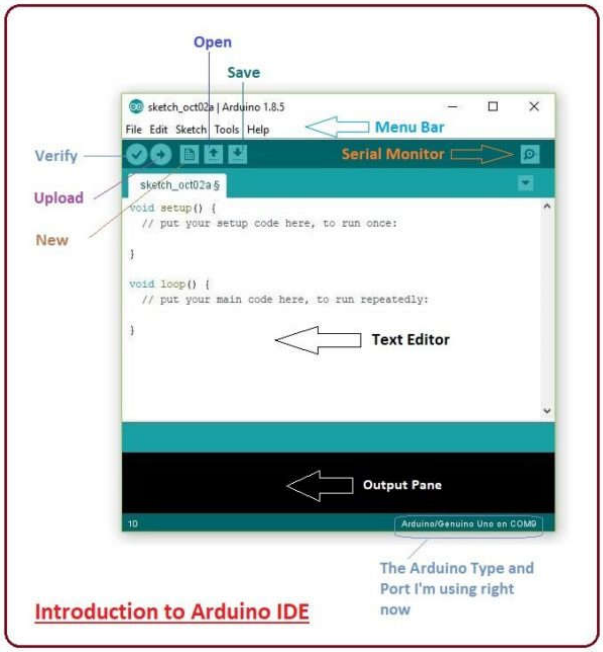
Pin Number	Pin Name	Description
1	Vcc	Input voltage is +5V for typical applications. Can range from 4.5V- 12V
2	High/Low Ouput (Dout)	Digital pulse high (3.3V) when triggered (motion detected) digital low(0V) when idle(no motion detected
3	Ground	Connected to ground of circuit

PIR Sensor Features

- Wide range on input voltage varying from 4.V to 12V (+5V recommended)
- Output voltage is High/Low (3.3V TTL)
- Can distinguish between object movement and human movement
- Has to operating modes - Repeatable(H) and Non- Repeatable(H)
- Cover distance of about 120° and 7 meters
- Low power consumption of 65mA
- Operating temperature from -20° to +80° Celsius

Software Requirement

Arduino IDE Software Intro

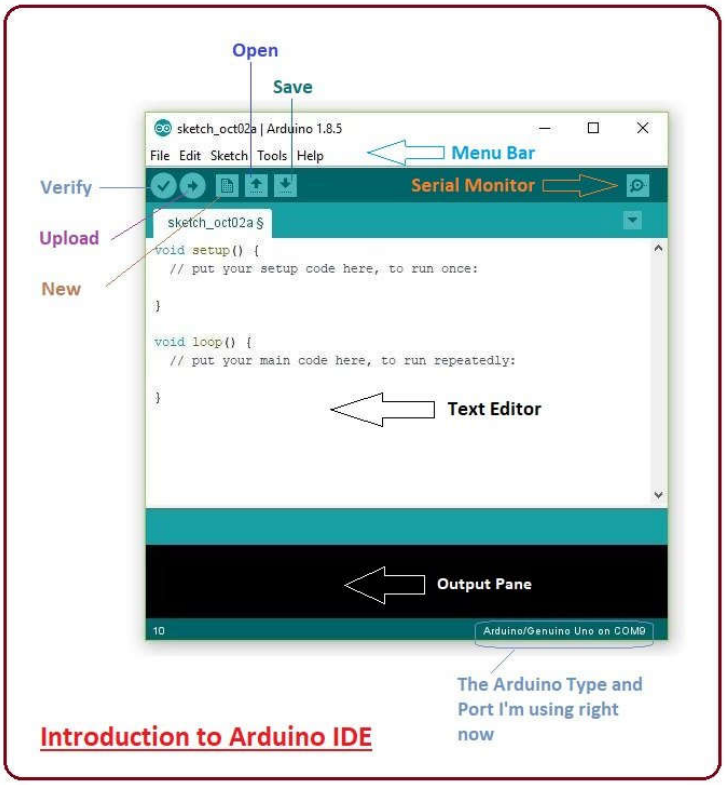


An official software introduced by Arduino.cc, that is mainly used for writing, compiling and uploading the code in almost all Arduino modules/boards. Arduino IDE is open-source software and is easily available to download & install.

- **Arduino IDE** is an open-source software, designed by Arduino.cc and mainly used for writing, compiling & uploading code to almost all Arduino Modules.
- It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.

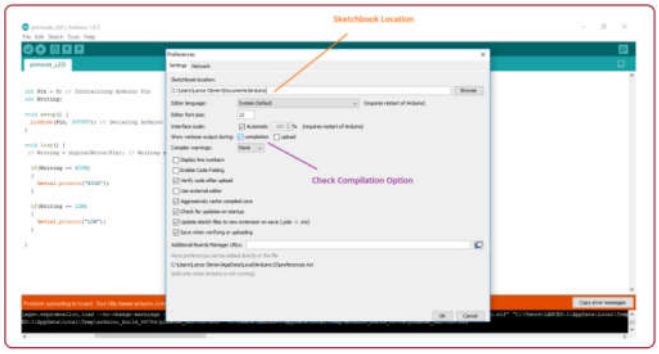
- It is available for all operating systems i.e. MAC, Windows, Linux and runs on the Java Platform that comes with inbuilt functions and commands that play a vital role in debugging, editing and compiling the code.
- A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro and many more.
- Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code.

- The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board.
- The IDE environment mainly contains two basic parts: Editor and Compiler where the former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.
- This environment supports both C and C++ languages.



File	
New	This is used to open new text editor window to write your code
Open	Used for opening the existing written code
Open Recent	The option reserved for opening recently closed program
Sketchbook	It stores the list of codes you have written for your project
Examples	Default examples already stored in the IDE software
Close	Used for closing the main screen window of recent tab. If two tabs are open, it will ask you again as you aim to close the second tab
Save	It is used for saving the recent program
Save as	It will allow you to save the recent program in your desired folder
Page setup	Page setup is used for modifying the page with portrait and landscape options. Some default page options are already given from which you can select the page you intend to work on
Print	It is used for printing purpose and will send the command to the printer
Preferences	It is page with number of preferences you aim to setup for your text editor page
Quit	It will quit the whole software all at once

- As you go to the preference section and check the compilation section, the Output Pane will show the code compilation as you click the upload button.

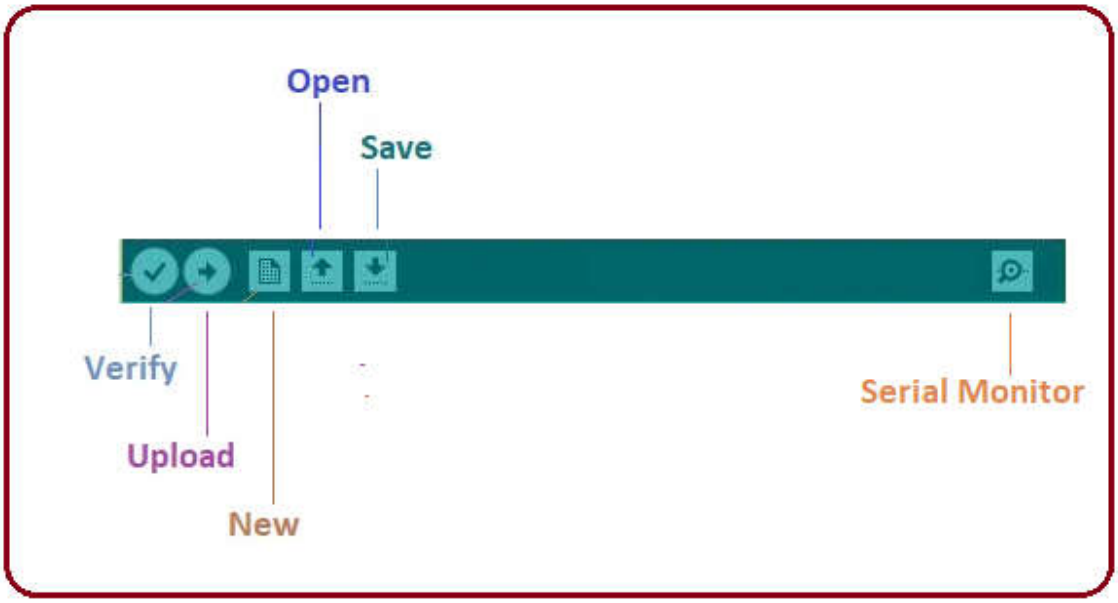


- And at the end of the compilation, it will show you the hex file it has generated for the recent sketch that will send to the Arduino Board for the specific task you aim to achieve.

- **Edit** – Used for copying and pasting the code with further modification for font
- **Sketch** – For compiling and programming
- **Tools** – Mainly used for testing projects. The Programmer section in this panel is used for burning a bootloader to the new microcontroller.

- **Help** – In case you are feeling skeptical about software, complete help is available from getting started to troubleshooting.

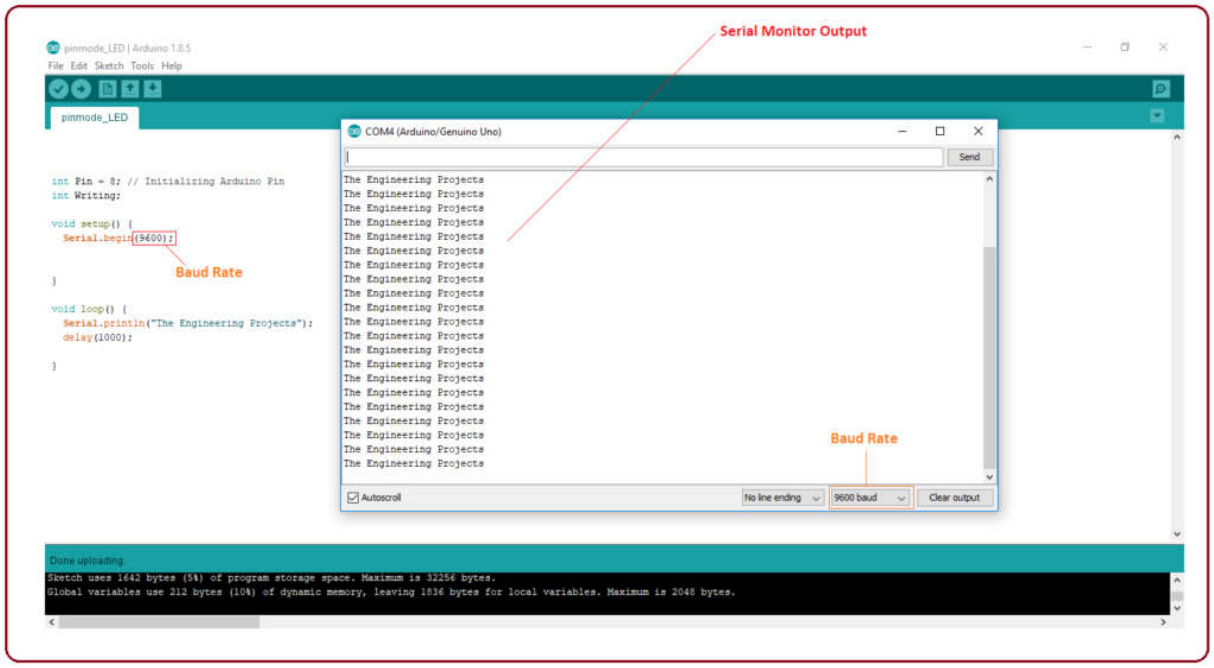
The **Six Buttons** appearing under the Menu tab are connected with the running program as follows.



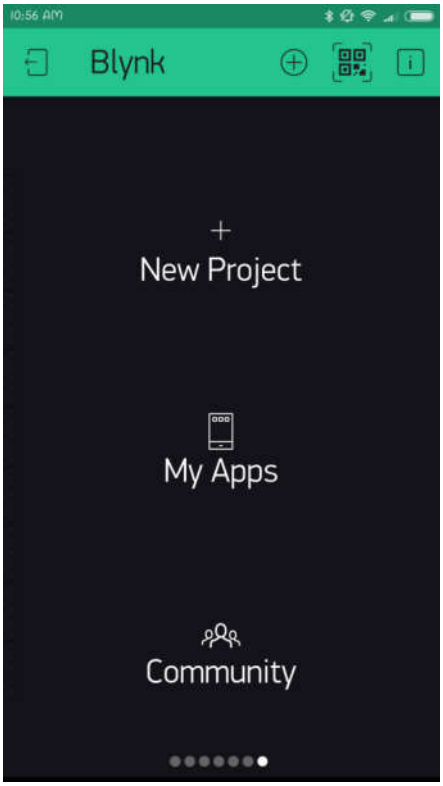
- The checkmark appearing in the circular button is used to verify the code. Click this once you have written your code.
- The arrow key will upload and transfer the required code to the Arduino board.
- The dotted paper is used for creating a new file.

- The upward arrow is reserved for opening an existing Arduino project.
- The downward arrow is used to save the current running code.
- The button appearing on the top right corner is a **Serial Monitor** – A separate pop-up window that acts as an independent terminal and plays a vital role in sending and receiving the Serial Data. You can also go to the Tools panel and select Serial Monitor, or pressing Ctrl+Shift+M all at once will open it instantly. The Serial Monitor will actually help to debug the written Sketches where you can get a hold of how your program is operating. Your Arduino Module should be connected to your computer by USB cable in order to activate the Serial Monitor.

- You need to select the baud rate of the Arduino Board you are using right now. For my Arduino Uno Baud Rate is 9600, as you write the following code and click the Serial Monitor, the output will show as the image below.



Blynk is a Platform with IOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets.



Supported Hardware

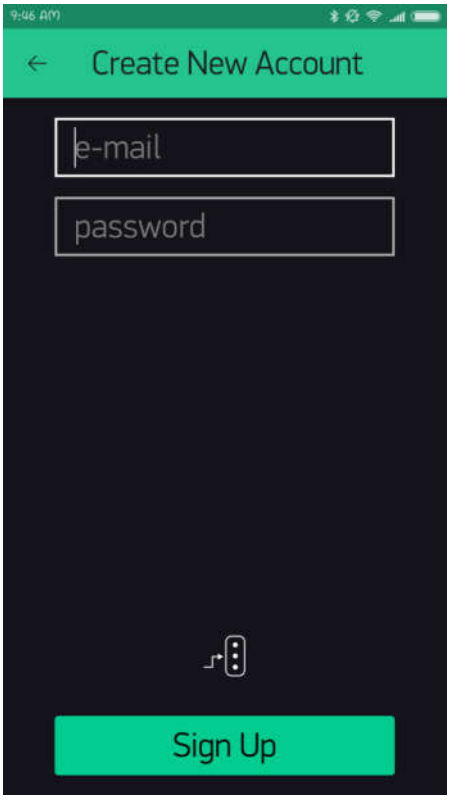
Blynk App

Blynk application can be found from the following links –

1. Android Blynk App

2. IOS Blynk App

After downloading the app, create an account and log in. (If possible than log in with your real mail id for better connectivity later.)

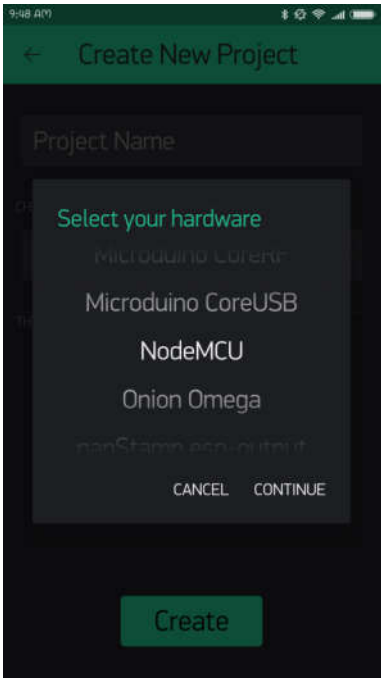


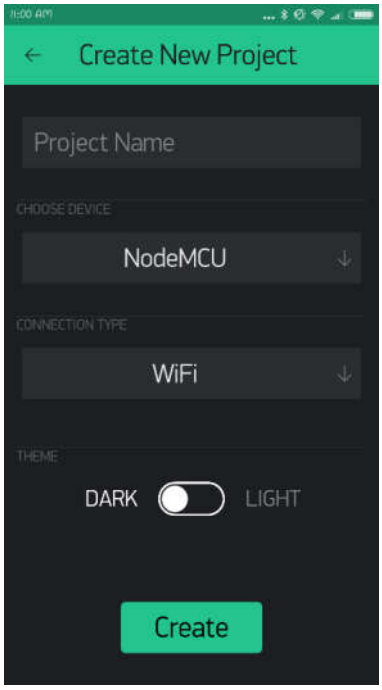
You'll also need to install the Blynk Arduino Library, which helps generate the firmware running on your ESP8266. Download the latest release from https://github.com/blynkkk/blynk-library/releases , and follow along with the directions there to install the required libraries.

2. Create a Blynk Project

Click the "Create New Project" in the app to create a new Blynk app. Give it any name.

Blynk works with hundreds of hardware models and connection types. Select the Hardware type. After this, select connection type. In this project we have select WiFi connectivity.





The ***Auth Token*** is very important – you'll need to stick it into your ESP8266's firmware. For now, copy it down or use the "E-mail" button to send it to yourself.

3. Add Widgets To The Project

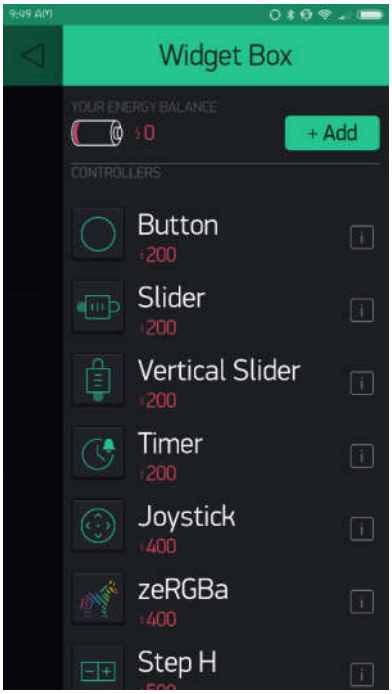
Then you'll be presented with a blank new project. To open the widget box, click in the project window to open.

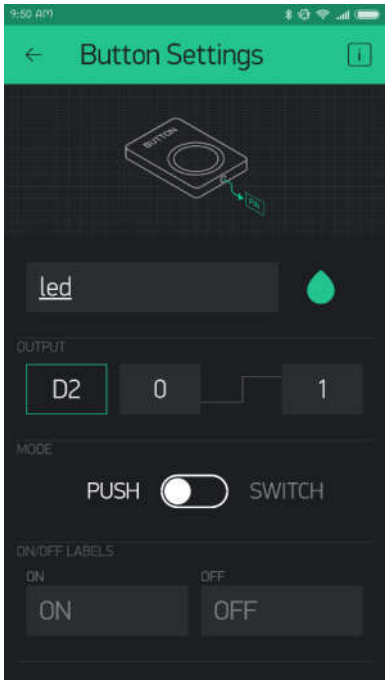
We are selecting a button to control Led connected with NodeMCU.

1. Click on Button.
2. Give name to Button say led.
3. Under OUTPUT tab- Click pin and select the pin to which led is connected to NodeMCU, here it is digital pin 2, hence select digital and under pin D2. And Click continue.

Under MODE tab- Select whether you want this button as "push button" or "Switch".

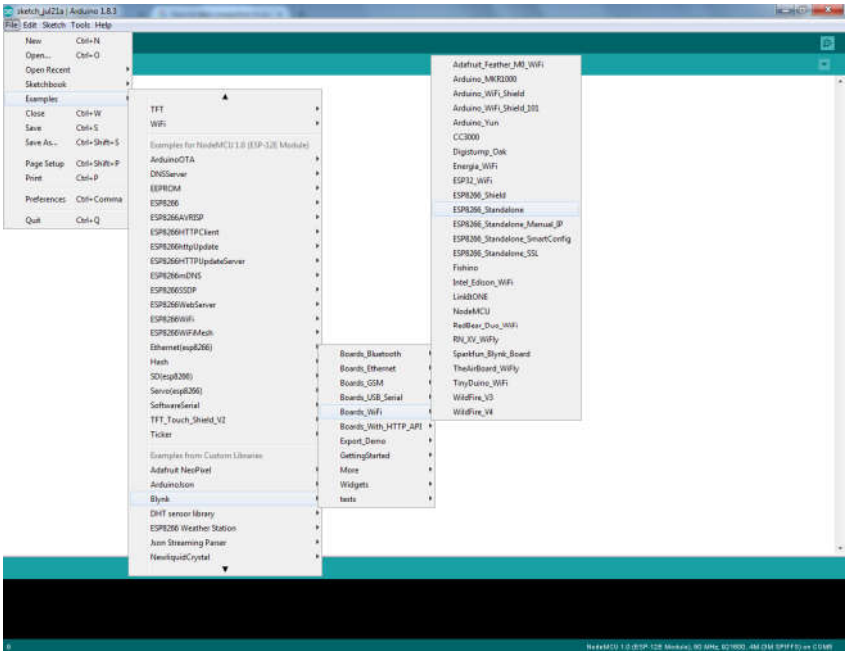
You have successfully created a GUI for Arduino.





4. Upload The Firmware

Now that your Blynk project is set-up, open Arduino and navigate to the ESP8266_Standalone example in the File > Examples > Blynk > Boards_WiFi> ESP8266_Standalone menu.



Advantages

1. Works accordingly Soil condition.
2. Reduction of manpower.
3. Wastage of water can be minimized.
4. Product quality should be increased.
5. Maintaining healthiness of crops.
6. Protection of crops from the Hazardous natural factors.
7. Productivity Increases

Disadvantages

1. The cost of acquiring the CCTV surveillance security cameras is expensive

Chapter 6

CONCLUSION

The devised method was used to study four content, i.e., the efficiency of detection by sensor, capturing ability of camera, the battery life span and the design analysis of system. The model could be carried commercially a minimal amount of operating cost and production. Thus, the farm of the very vast field can be make safe easily without human effort. It is much portable and can be directed with smart phone so, one can easily operate it with their hand set. The gist of this job is, it can cut the give security of a specific area of flat area and also barrier have to be affect with along the way. This project is environmentally safe because it has been operated by eco-friendly components, In future more research would be possible to development with different features.

Future scope

In the future, there will be a large scope for this system. The IR sensors and Ultrasonic sensors are used to collect the information and transmitted through GSM. This project is further enhanced by wireless sensor network.The type of sensors like finding the moisture content of the soil, growth of the crop and nutrition content in the soil. These sensors gather information which is useful to the farmers and able to be conscious of the farm land from anyplace in the world.

Chapter 7

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RESULT

CODE