Project Based Learning

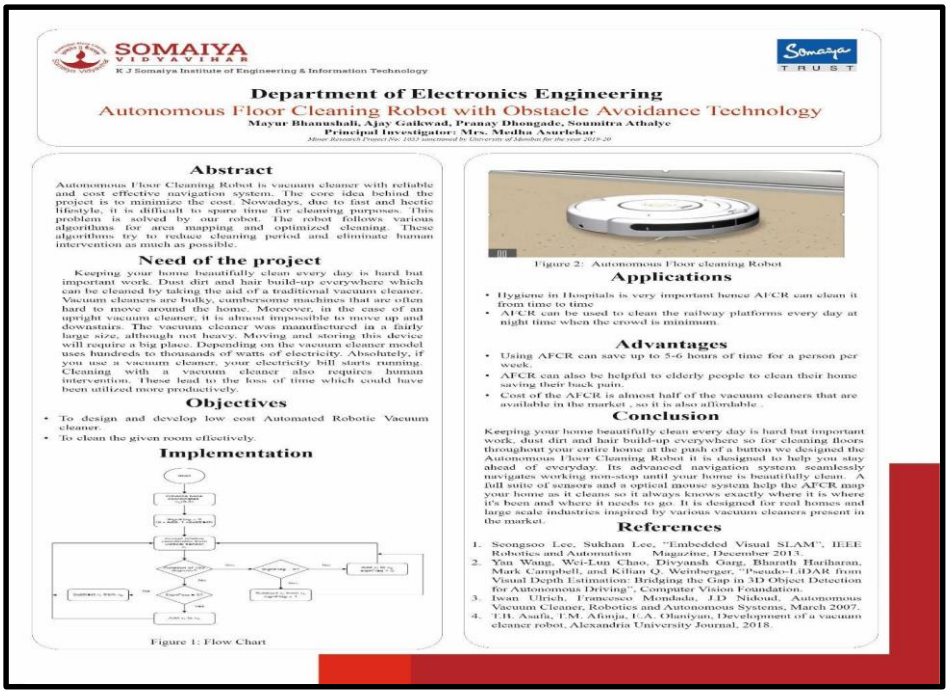
Name of the project: Autonomous Floor Cleaning Robot with Obstacle Avoidance Technology

Investigators: Mrs. Medha Asurlekar

Domain: Robotics

Year :2019-20

Status: Completed



SOMAIYA VIDYAVIHAR
K J Somaiya Institute of Engineering & Information Technology

Department of Electronics Engineering

Autonomous Floor Cleaning Robot with Obstacle Avoidance Technology

Mayur Bhanushali, Ajay Gaikwad, Pranay Dhongade, Soumitra Athalye

Principal Investigator: Mrs. Medha Asurlekar

Minor Research Project No. 1103 sanctioned by University of Mumbai for the year 2019-20

Abstract

Autonomous Floor Cleaning Robot is vacuum cleaner with reliable and cost effective navigation system. The core idea behind the project is to minimize the cost. Nowadays, due to fast and hectic lifestyle, it is difficult to spare time for cleaning purposes. This problem is solved by our robot. The robot follows various algorithms for area mapping and optimized cleaning. These algorithms try to reduce cleaning period and eliminate human intervention as much as possible.

Need of the project

Keeping your home beautifully clean every day is hard but important work. Dust dirt and hair build-up everywhere which can be cleaned by taking the aid of a traditional vacuum cleaner. Vacuum cleaners are bulky, cumbersome machines that are often hard to move around the home. Moreover, in the case of an upright vacuum cleaner, it is almost impossible to move up and downstairs. The vacuum cleaner was manufactured in a fairly large size, although not heavy. Moving and storing this device will require a big place. Depending on the vacuum cleaner model uses hundreds to thousands of watts of electricity. Absolutely, if you use a vacuum cleaner, your electricity bill starts running. Cleaning with a vacuum cleaner also requires human intervention. These lead to the loss of time which could have been utilized more productively.

Objectives

- To design and develop low cost Automated Robotic Vacuum cleaner.
- To clean the given room effectively.

Implementation

Figure 1: Flow Chart

Figure 2: Autonomous Floor cleaning Robot

Applications

- Hygiene in Hospitals is very important hence AFCR can clean it from time to time
- AFCR can be used to clean the railway platforms every day at night time when the crowd is minimum.

Advantages

- Using AFCR can save up to 5-6 hours of time for a person per week.
- AFCR can also be helpful to elderly people to clean their home saving their back pain.
- Cost of the AFCR is almost half of the vacuum cleaners that are available in the market , so it is also affordable.

Conclusion

Keeping your home beautifully clean every day is hard but important work, dust dirt and hair build-up everywhere so for cleaning floors throughout your entire home at the push of a button we designed the Autonomous Floor Cleaning Robot it is designed to help you stay ahead of everyday. Its advanced navigation system seamlessly navigates working non-stop until your home is beautifully clean. A full suite of sensors and a optical mouse system help the AFCR map your home as it cleans so it always knows exactly where it is where it's been and where it needs to go. It is designed for real homes and large scale industries inspired by various vacuum cleaners present in the market.

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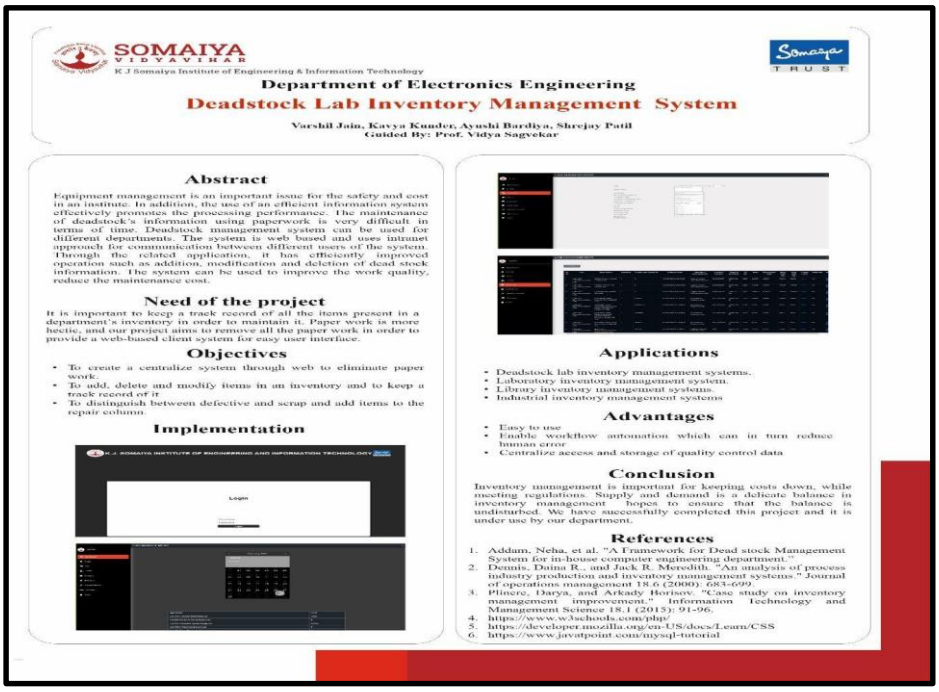
Name of the project: Deadstock Lab Inventory Management System

Investigators: Mrs. Vidya Sagvekar

Domain: Educational

Year : 2020-21

Status: Completed



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Department of Electronics Engineering

Deadstock Lab Inventory Management System

Varshil Jain, Kavya Kundec, Ayushi Bardiya, Shrejay Patil

Guided By: Prof. Vidya Sagvekar

Abstract

Equipment management is an important issue for the safety and cost in an institute. In addition, the use of an efficient information system effectively promotes the processing performance. The maintenance of deadstock's information using paperwork is very difficult in terms of time. Deadstock management system can be used for different departments. The system is web based and uses intranet approach for communication between different users of the system. Through the related application, it has efficiently improved operation such as addition, modification and deletion of dead stock information. The system can be used to improve the work quality, reduce the maintenance cost.

Need of the project

It is important to keep a track record of all the items present in a department's inventory in order to maintain it. Paper work is more hectic, and our project aims to remove all the paper work in order to provide a web-based client system for easy user interface.

Objectives

- To create a centralize system through web to eliminate paper work.
- To add, delete and modify items in an inventory and to keep a track record of it
- To distinguish between defective and scrap and add items to the repair column.

Implementation

Applications

- Deadstock lab inventory management systems.
- Laboratory inventory management system.
- Library inventory management systems.
- Industrial inventory management systems

Advantages

- Easy to use
- Enable workflow automation which can in turn reduce human error
- Centralize access and storage of quality control data

Conclusion

Inventory management is important for keeping costs down, while meeting regulations. Supply and demand is a delicate balance in inventory management hopes to ensure that the balance is undisturbed. We have successfully completed this project and it is under use by our department.

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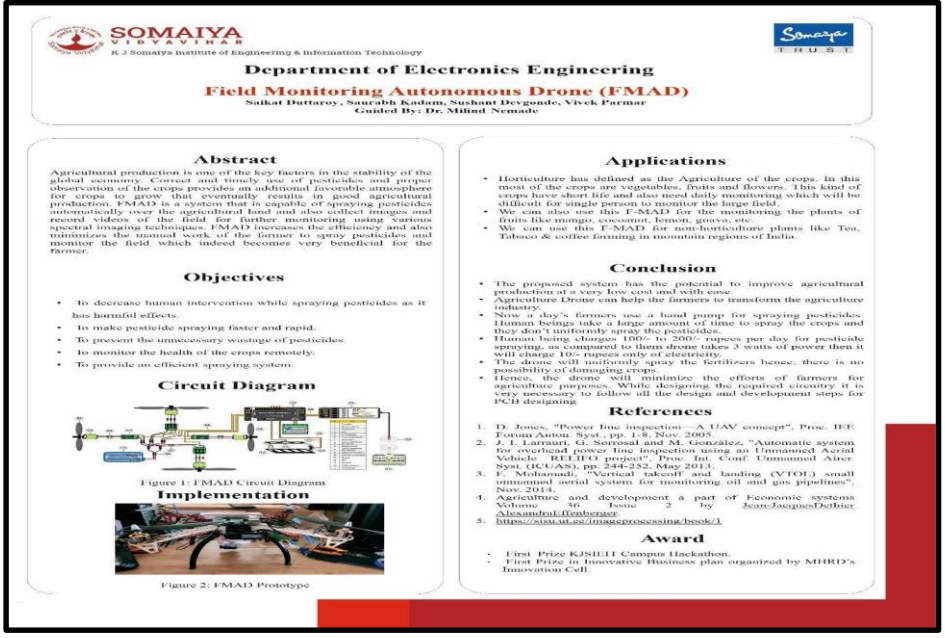
Name of the project: Field Monitoring Autonomous Drone (FMAD)

Investigators: Dr. Milind Nemade

Domain: Agriculture

Year : 2019-20

Status: Completed



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Field Monitoring Autonomous Drone (FMAD)

Saikat Duttaroy, Saurabh Kadam, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade

Abstract

Agricultural production is one of the key factors in the stability of the global economy. Correct and timely use of pesticides and proper observation of the crops provides an additional favorable atmosphere for crops to grow that eventually results in good agricultural production. FMAD is a system that is capable of spraying pesticides automatically over the agricultural land and also collect images and record videos of the field for further monitoring using various spectral imaging techniques. FMAD increases the efficiency and also minimizes the manual work of the farmer to spray pesticides and monitor the field which indeed becomes very beneficial for the farmer.

Objectives

- To decrease human intervention while spraying pesticides as it has harmful effects.
- To make pesticide spraying faster and rapid.
- To prevent the unnecessary wastage of pesticides.
- To monitor the health of the crops remotely.
- To provide an efficient spraying system.

Circuit Diagram

Figure 1: FMAD Circuit Diagram

Implementation

Figure 2: FMAD Prototype

Applications

- Horticulture has defined as the Agriculture of the crops. In this most of the crops are vegetables, fruits and flowers. This kind of crops have short life and also need daily monitoring which will be difficult for single person to monitor the large field.
- We can also use this F-MAD for the monitoring the plants of fruits like mango, coconut, lemon, guava, etc.
- We can use this F-MAD for non-horticulture plants like Tea, Tobacco & coffee farming in mountain regions of India.

Conclusion

- The proposed system has the potential to improve agricultural production at a very low cost and with ease.
- Agriculture Drone can help the farmers to transform the agriculture industry.
- Now a day's farmers use a hand pump for spraying pesticides. Human beings take a large amount of time to spray the crops and they don't uniformly spray the pesticides.
- Human being charges 100/- to 200/- rupees per day for pesticide spraying, as compared to them drone takes 3 watts of power then it will charge 10/- rupees only of electricity.
- The drone will uniformly spray the fertilizers hence; there is no possibility of damaging crops.
- Hence, the drone will minimize the efforts of farmers for agriculture purposes. While designing the required circuitry it is very necessary to follow all the design and development steps for PCB designing.

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Award

- First Prize KJSIEIT Campus Hackathon.
- First Prize in Innovative Business plan organized by MHRD's Innovation Cell.

Name of the project: Environmental Friendly Solar Grass Cutter

Investigators: Mrs. Sheetal Jagtap

Domain: Use of Renewable Source of Energy

Year :2019-20

Status: Completed

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Department of Electronics Engineering

Environmental Friendly Solar Grass Cutter

Nikhil Bhujbal, Tanmay Baboli, Rahul Goregaonkar, Karan Doshi
Principal Investigator: Mrs. Sheetal Jagtap
Minor Research Project No. 520 sanctioned by University of Mumbai for the year 2019-20

Abstract

Currently, manually handled devices works on non- renewable sources of energy. Automatic solar grass cutter focuses on the use of renewable source of energy which will help to reduce the emission of harmful gases which are emitted by the conventional grass cutter. Automatic solar grass cutter requires low maintenance and less human interface as compared to conventional grass cutter. Recently we are facing problems like air pollution, noise pollution, power cut problems, etc. In order to overcome these problems conventional grass cutter can be replaced by automatic solar grass cutter which is environmental friendly. In this project IR Proximity sensor are used to detect and avoid object/animal/human while operating. This machine consist of battery which charges simultaneously while operating. If the climatic conditions are not suitable for the solar panel to generate power and if the user wants to operate the machine at that time, then there is an alternative source of power through battery. Power consumption in this machine is less as compared to conventional grass cutter. The movement of the machine is totally controlled by automatic mode and manual mode.

Need of the project

Nowadays, manually operated traditional engine based grass cutter are used. Over the field traditional grass cutting machine can create pollution and loss of energy. Automatic solar grass cutter will reduce the effort required for cutting the grass in the lawns.

Objectives

- To make use of a renewable source of energy in a grass cutter design.
- To reduce air & noise pollution.
- To overcome the problem of traditional grass cutter.

Implementation

Figure 1:System Flow Chart

Figure 2: Solar Grass Cutter

Applications

- Garners for cutting the grass without use of fuel and electricity.
- Main Target is to reduce human efforts, main stakeholders are gardeners of gardens.

Advantages

- Less efforts
- less pollution
- Fuel saving means money saving
- No noise pollution

Conclusion

Due to power demand we choose solar energy which is a renewable source of energy and hence there is no running cost. Our project entitled Android app operated solar powered grass cutter is successfully completed and results obtained are satisfactory. This project is also suitable as it is having much more advantages i.e. no fuel cost, no pollution and no fuel residue. This system is having a facility of charging the batteries while the solar grass cutter is in motion. The DC motor in low power with high efficiency. This project eliminates the physical power required in pushing without sacrificing safety.

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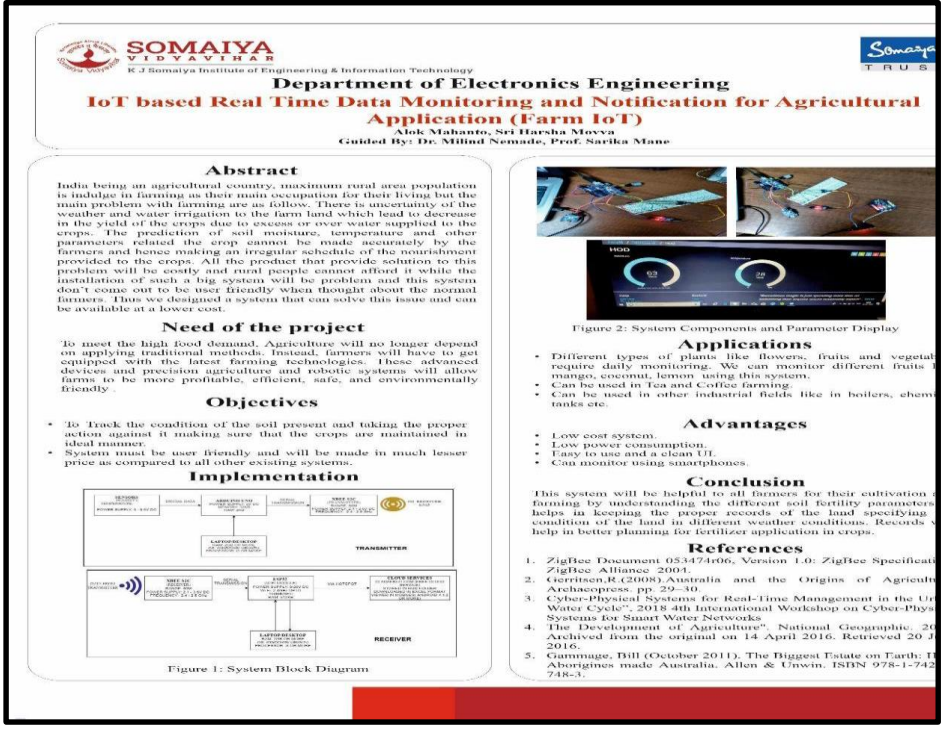
Name of the project: IoT based Real Time Data Monitoring and Notification for Agricultural Application (Farm Iot)

Investigators: Dr. Milind Nemade, Mrs. Sarika Mane

Domain: Agriculture

Year : 2019-20

Status: Completed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Department of Electronics Engineering

IoT based Real Time Data Monitoring and Notification for Agricultural Application (Farm IoT)

Alok Mahanto, Sri Harsha Movva
Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

India being an agricultural country, maximum rural area population is indulge in farming as their main occupation for their living but the main problem with farming are as follow. There is uncertainty of the weather and water irrigation to the farm land which lead to decrease in the yield of the crops due to excess or over water supplied to the crops. The prediction of soil moisture, temperature and other parameters related the crop cannot be made accurately by the farmers and hence making an irregular schedule of the nourishment provided to the crops. All the product that provide solution to this problem will be costly and rural people cannot afford it while the installation of such a big system will be problem and this system don't come out to be user friendly when thought about the normal farmers. Thus we designed a system that can solve this issue and can be available at a lower cost.

Need of the project

To meet the high food demand, Agriculture will no longer depend on applying traditional methods. Instead, farmers will have to get equipped with the latest farming technologies. These advanced devices and precision agriculture and robotic systems will allow farms to be more profitable, efficient, safe, and environmentally friendly.

Objectives

- To Track the condition of the soil present and taking the proper action against it making sure that the crops are maintained in ideal manner.
- System must be user friendly and will be made in much lesser price as compared to all other existing systems.

Implementation

Figure 1: System Block Diagram

Figure 2: System Components and Parameter Display

Applications

- Different types of plants like flowers, fruits and vegetal require daily monitoring. We can monitor different fruits mango, coconut, lemon using this system.
- Can be used in Tea and Coffee farming.
- Can be used in other industrial fields like in boilers, chem tanks etc.

Advantages

- Low cost system.
- Low power consumption.
- Easy to use and a clean UI.
- Can monitor using smartphones.

Conclusion

This system will be helpful to all farmers for their cultivation farming by understanding the different soil fertility parameters helps in keeping the proper records of the land specifying condition of the land in different weather conditions. Records help in better planning for fertilizer application in crops.

References

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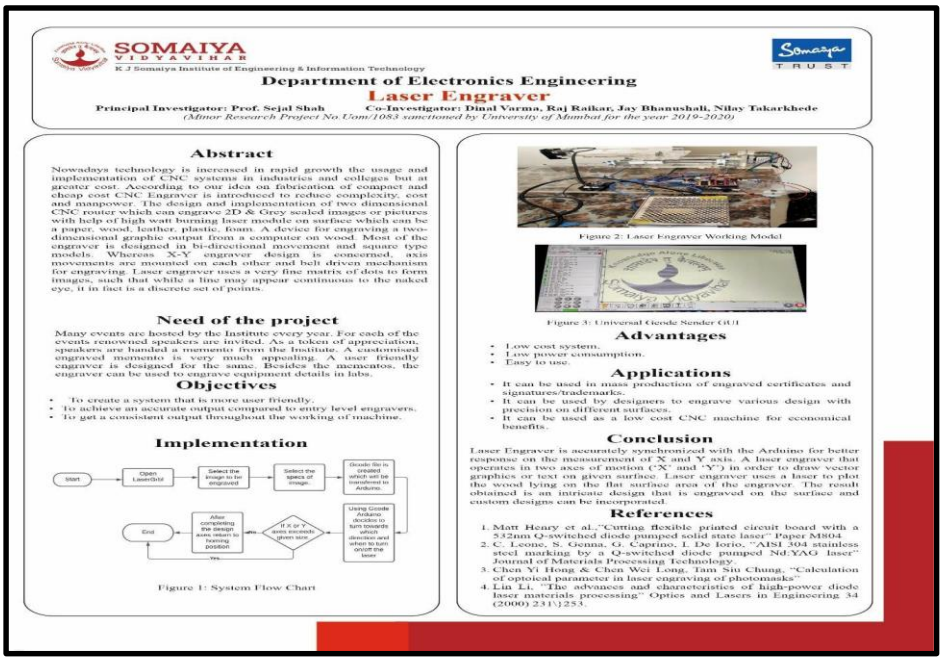
Name of the project: Laser Engraver

Investigators: Mrs. Sejal Shah

Domain: Embedded System, Mechanical

Year : 2020-21

Status: Completed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Department of Electronics Engineering

Laser Engraver

Principal Investigator: Prof. Sejal Shah
Co-Investigator: Dinal Varma, Raj Raikar, Jay Bhanushali, Nilay Takarkhede

(Minor Research Project No.Uam/1083 sanctioned by University of Mumbai for the year 2019-2020)

Abstract

Nowadays technology is increased in rapid growth the usage and implementation of CNC systems in industries and colleges but at greater cost. According to our idea on fabrication of compact and cheap cost CNC Engraver is introduced to reduce complexity, cost and manpower. The design and implementation of two dimensional CNC router which can engrave 2D & Grey scaled images or pictures with help of high watt burning laser module on surface which can be a paper, wood, leather, plastic, foam. A device for engraving a two-dimensional graphic output from a computer on wood. Most of the engraver is designed in bi-directional movement and square type models. Whereas X-Y engraver design is concerned, axis movements are mounted on each other and belt driven mechanism for engraving. Laser engraver uses a very fine matrix of dots to form images, such that while a line may appear continuous to the naked eye, it in fact is a discrete set of points.

Need of the project

Many events are hosted by the Institute every year. For each of the events renowned speakers are invited. As a token of appreciation, speakers are handed a memento from the Institute. A customised engraved memento is very much appealing. A user friendly engraver is designed for the same. Besides the mementos, the engraver can be used to engrave equipment details in labs.

Objectives

- To create a system that is more user friendly.
- To achieve an accurate output compared to entry level engravers.
- To get a consistent output throughout the working of machine.

Implementation

Figure 1: System Flow Chart

Figure 2: Laser Engraver Working Model

Figure 3: Universal Gcode Sender GUI

Advantages

- Low cost system.
- Low power consumption.
- Easy to use.

Applications

- It can be used in mass production of engraved certificates and signatures/trademarks.
- It can be used by designers to engrave various design with precision on different surfaces.
- It can be used as a low cost CNC machine for economical benefits.

Conclusion

Laser Engraver is accurately synchronized with the Arduino for better response on the measurement of X and Y axis. A laser engraver that operates in two axes of motion ('X' and 'Y') in order to draw vector graphics or text on given surface. Laser engraver uses a laser to plot the wood lying on the flat surface area of the engraver. The result obtained is an intricate design that is engraved on the surface and custom designs can be incorporated.

References

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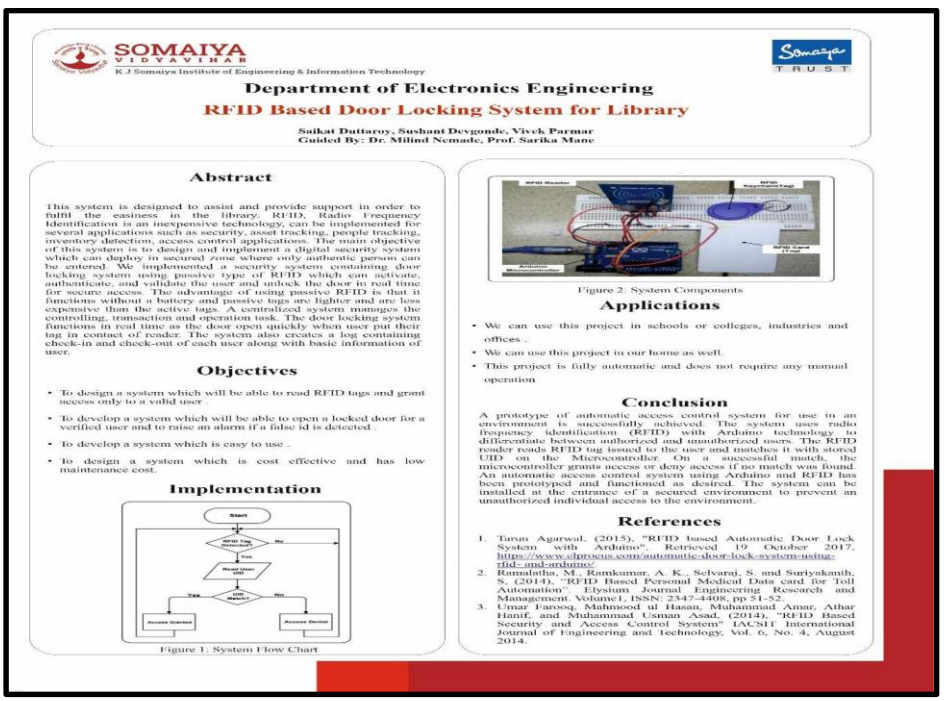
Name of the project: RFID Based Door Locking System for Library

Investigators: Mrs. Sarika Mane

Domain: Education

Year : 2018-19

Status: Completed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Department of Electronics Engineering

RFID Based Door Locking System for Library

Saikat Dattaroy, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

This system is designed to assist and provide support in order to fulfil the easiness in the library. RFID, Radio Frequency Identification is an inexpensive technology, can be implemented for several applications such as security, asset tracking, people tracking, inventory detection, access control applications. The main objective of this system is to design and implement a digital security system which can deploy in secured zone where only authentic person can be entered. We implemented a security system containing door locking system using passive type of RFID which can activate, authenticate, and validate the user and unlock the door in real time for secure access. The advantage of using passive RFID is that it functions without a battery and passive tags are lighter and are less expensive than the active tags. A centralized system manages the controlling, transaction and operation task. The door locking system functions in real time as the door open quickly when user put their tag in contact of reader. The system also creates a log containing check-in and check-out of each user along with basic information of user.

Objectives

- To design a system which will be able to read RFID tags and grant access only to a valid user .
- To develop a system which will be able to open a locked door for a verified user and to raise an alarm if a false id is detected .
- To develop a system which is easy to use .
- To design a system which is cost effective and has low maintenance cost.

Implementation

Figure 1: System Flow Chart

Figure 2: System Components

Applications

- We can use this project in schools or colleges, industries and offices .
- We can use this project in our home as well.
- This project is fully automatic and does not require any manual operation

Conclusion

A prototype of automatic access control system for use in an environment is successfully achieved. The system uses radio frequency identification (RFID) with Arduino technology to differentiate between authorized and unauthorized users. The RFID reader reads RFID tag issued to the user and matches it with stored UID on the Microcontroller. On a successful match, the microcontroller grants access or deny access if no match was found. An automatic access control system using Arduino and RFID has been prototyped and functioned as desired. The system can be installed at the entrance of a secured environment to prevent an unauthorized individual access to the environment.

References

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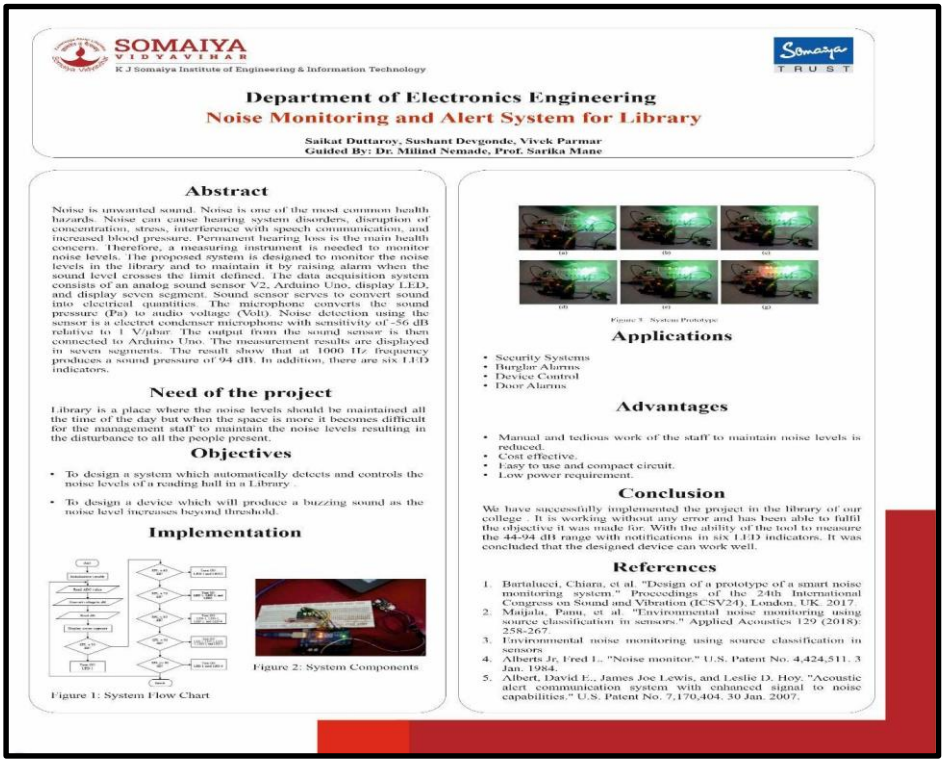
Name of the project: Noise Monitoring and Alert System for Library

Investigators: Mrs. Sarika Mane

Domain: Education

Year : 2018-19

Status: Completed



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Department of Electronics Engineering

Noise Monitoring and Alert System for Library

Saikat Duttaroy, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

Noise is unwanted sound. Noise is one of the most common health hazards. Noise can cause hearing system disorders, disruption of concentration, stress, interference with speech communication, and increased blood pressure. Permanent hearing loss is the main health concern. Therefore, a measuring instrument is needed to monitor noise levels. The proposed system is designed to monitor the noise levels in the library and to maintain it by raising alarm when the sound level crosses the limit defined. The data acquisition system consists of an analog sound sensor V2, Arduino Uno, display LED, and display seven segment. Sound sensor serves to convert sound into electrical quantities. The microphone converts the sound pressure (Pa) to audio voltage (Volt). Noise detection using the sensor is a electret condenser microphone with sensitivity of -56 dB relative to 1 V/μbar. The output from the sound sensor is then connected to Arduino Uno. The measurement results are displayed in seven segments. The result show that at 1000 Hz frequency produces a sound pressure of 94 dB. In addition, there are six LED indicators.

Need of the project

Library is a place where the noise levels should be maintained all the time of the day but when the space is more it becomes difficult for the management staff to maintain the noise levels resulting in the disturbance to all the people present.

Objectives

- To design a system which automatically detects and controls the noise levels of a reading hall in a Library .
- To design a device which will produce a buzzing sound as the noise level increases beyond threshold.

Implementation

Figure 1: System Flow Chart

Figure 2: System Components

Figure 3 : System Prototype

Applications

- Security Systems
- Burglar Alarms
- Device Control
- Door Alarms

Advantages

- Manual and tedious work of the staff to maintain noise levels is reduced.
- Cost effective.
- Easy to use and compact circuit.
- Low power requirement.

Conclusion

We have successfully implemented the project in the library of our college . It is working without any error and has been able to fulfil the objective it was made for. With the ability of the tool to measure the 44-94 dB range with notifications in six LED indicators. It was concluded that the designed device can work well.

References

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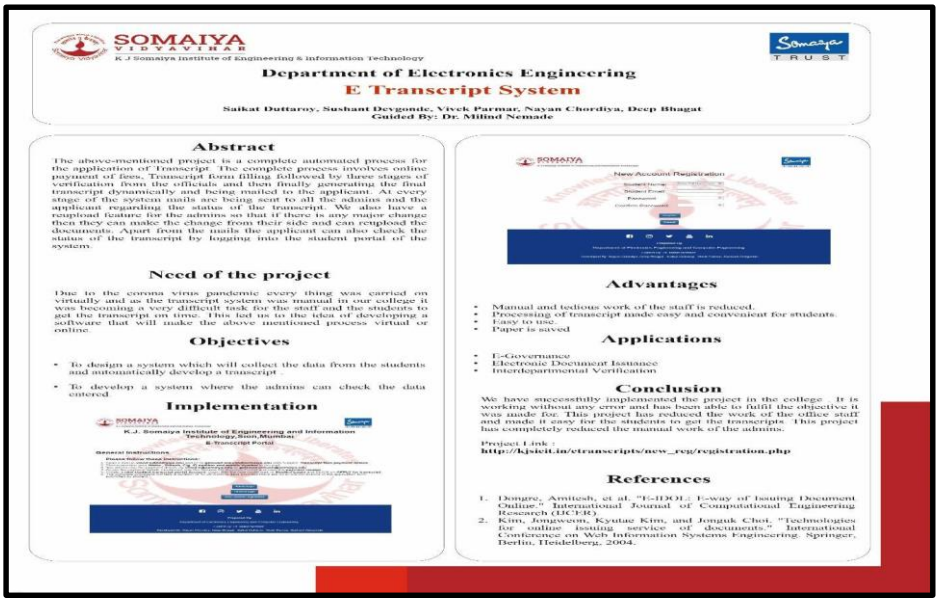
Name of the project: E Transcript System

Investigators: Dr. Milind Nemade

Domain: Education

Year : 2020-21

Status: Completed



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Department of Electronics Engineering

E Transcript System

Saikat Duttaroy, Sushant Devgonde, Vivek Parmar, Nayan Chordiya, Deep Bhagat
Guided By: Dr. Milind Nemade

Abstract

The above-mentioned project is a complete automated process for the application of Transcript. The complete process involves online payment of fees, Transcript form filling followed by three stages of verification from the officials and then finally generating the final transcript dynamically and being mailed to the applicant. At every stage of the system mails are being sent to all the admins and the applicant regarding the status of the transcript. We also have a reupload feature for the admins so that if there is any major change then they can make the change from their side and can reupload the documents. Apart from the mails the applicant can also check the status of the transcript by logging into the student portal of the system.

Need of the project

Due to the corona virus pandemic every thing was carried on virtually and as the transcript system was manual in our college it was becoming a very difficult task for the staff and the students to get the transcript on time. This led us to the idea of developing a software that will make the above mentioned process virtual or online.

Objectives

- To design a system which will collect the data from the students and automatically develop a transcript .
- To develop a system where the admins can check the data entered

Implementation

Advantages

- Manual and tedious work of the staff is reduced.
- Processing of transcript made easy and convenient for students.
- Easy to use.
- Paper is saved

Applications

- E-Governance
- Electronic Document Instance
- Interdepartmental Verification

Conclusion

We have successfully implemented the project in the college . It is working without any error and has been able to fulfil the objective it was made for. This project has reduced the work of the office staff and made it easy for the students to get the transcripts. This project has completely reduced the manual work of the admins.

Project Link :
http://kjsieit.in/etranscripts/new_reg/registration.php

References

1. Dongre, Amitesh, et al. "E-IDOL: E-way of Issuing Document Online." International Journal of Computational Engineering Research (IJCER).
2. Kim, Jongweon, Kyutae Kim, and Jongtak Choi. "Technologies for online issuing service of documents." International Conference on Web Information Systems Engineering. Springer, Berlin, Heidelberg, 2004.

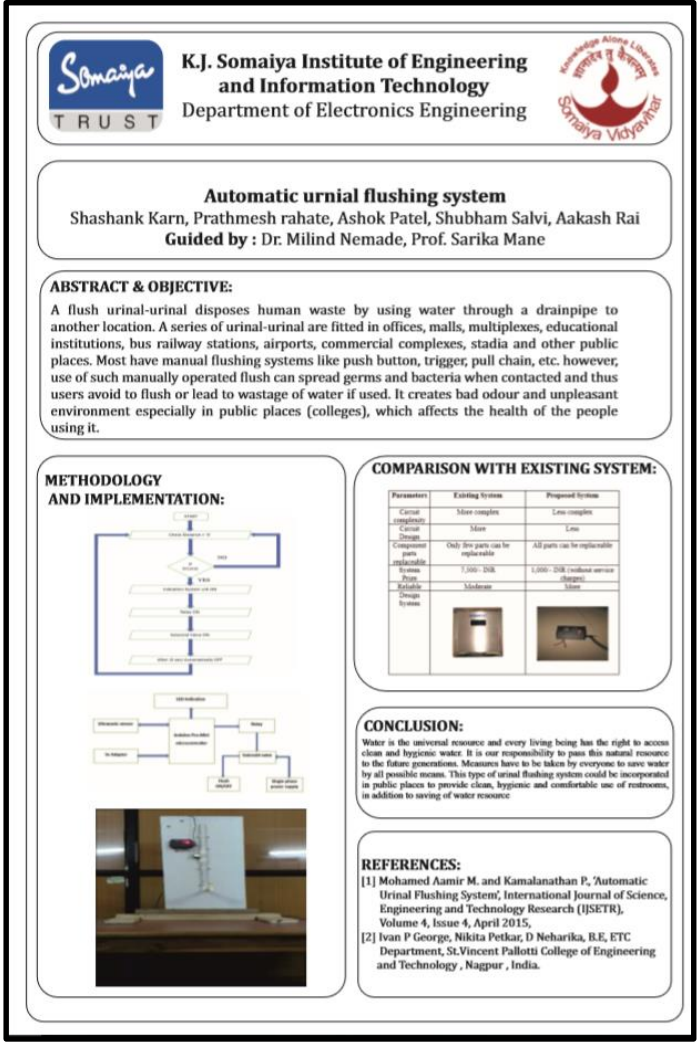
Name of the project: Low Cost Automated Urinary Water Flush System For Water Conservation

Investigators: Dr. Milind Nemade

Domain: Waste Management

Year : 2017-18

Status : Completed



K.J. Somaiya Institute of Engineering and Information Technology
Department of Electronics Engineering

Automatic urnial flushing system

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

A flush urinal-urinal disposes human waste by using water through a drainpipe to another location. A series of urinal-urinal are fitted in offices, malls, multiplexes, educational institutions, bus railway stations, airports, commercial complexes, stadia and other public places. Most have manual flushing systems like push button, trigger, pull chain, etc. however, use of such manually operated flush can spread germs and bacteria when contacted and thus users avoid to flush or lead to wastage of water if used. It creates bad odour and unpleasant environment especially in public places (colleges), which affects the health of the people using it.

METHODOLOGY AND IMPLEMENTATION:

COMPARISON WITH EXISTING SYSTEM:

CONCLUSION:

Water is the universal resource and every living being has the right to access clean and hygienic water. It is our responsibility to pass this natural resource to the future generations. Measures have to be taken by everyone to save water by all possible means. This type of urinal flushing system could be incorporated in public places to provide clean, hygienic and comfortable use of restrooms, in addition to saving of water resource

REFERENCES:

[1] Mohamed Aamir M. and Kamalanathan P, 'Automatic Urinal Flushing System', International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 4, April 2015,

[2] Ivan P George, Nikita Petkar, D Neharika, B.E, ETC Department, St.Vincent Pallotti College of Engineering and Technology , Nagpur , India.

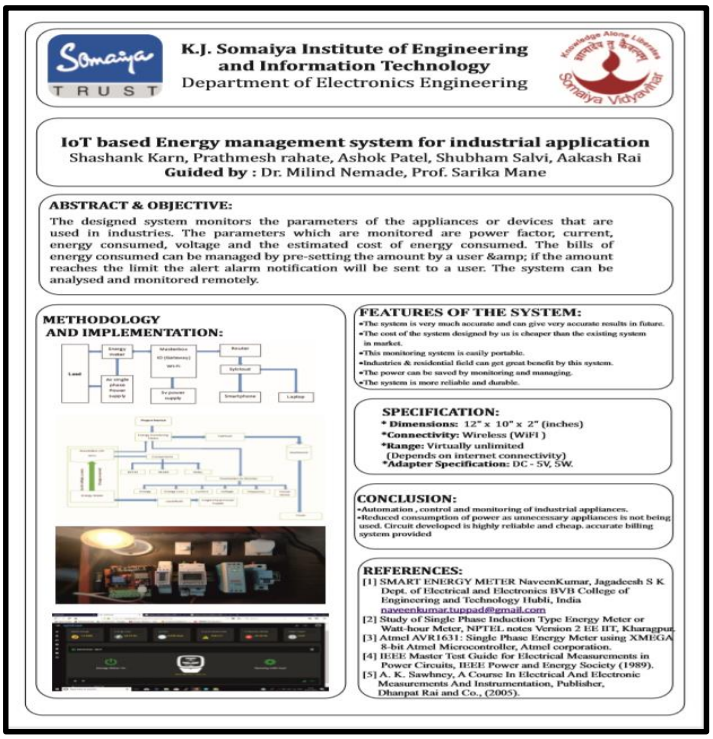
Name of the project: IoT Based Energy Management System for Industrial Applications

Investigators: Dr. Milind Nemade, Sarika Mane

Domain: Energy

Year : 2017-18

Status : Completed



K.J. Somaiya Institute of Engineering and Information Technology
Department of Electronics Engineering

IoT based Energy management system for industrial application

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

The designed system monitors the parameters of the appliances or devices that are used in industries. The parameters which are monitored are power factor, current, energy consumed, voltage and the estimated cost of energy consumed. The bills of energy consumed can be managed by pre-setting the amount by a user & if the amount reaches the limit the alert alarm notification will be sent to a user. The system can be analysed and monitored remotely.

METHODOLOGY AND IMPLEMENTATION:

FEATURES OF THE SYSTEM:

- The system is very much accurate and can give very accurate results in future.
- The cost of the system designed by us is cheaper than the existing system in market.
- This monitoring system is easily portable.
- Industries & residential field can get great benefit by this system.
- The power can be saved by monitoring and managing.
- The system is more reliable and durable.

SPECIFICATION:

* **Dimensions:** 12" x 10" x 2" (inches)
* **Connectivity:** Wireless (WiFi)
* **Range:** Virtually unlimited (Depends on internet connectivity)
* **Adapter Specification:** DC - 5V, 5W.

CONCLUSION:

- Automation , control and monitoring of industrial appliances.
- Reduced consumption of power as unnecessary appliances is not being used. Circuit developed is highly reliable and cheap. accurate billing system provided

REFERENCES:

[1] SMART ENERGY METER NaveenKumar, Jagadeesh S K Dept. of Electrical and Electronics BVB College of Engineering and Technology Hubli, India naveenkumar.tuppad@gmail.com

[2] Study of Single Phase Induction Type Energy Meter or Watt-hour Meter, NPTEL notes Version 2 EE IIT, Kharagpur

[3] Atmel AVR1631: Single Phase Energy Meter using XMEGA 8-bit Atmel Microcontroller, Atmel corporation.

[4] IEEE Master Test Guide for Electrical Measurements in Power Circuits, IEEE Power and Energy Society (1989).

[5] A. K. Sawhney, A Course In Electrical And Electronic Measurements And Instrumentation, Publisher, Dhanpat Rai and Co., (2005).

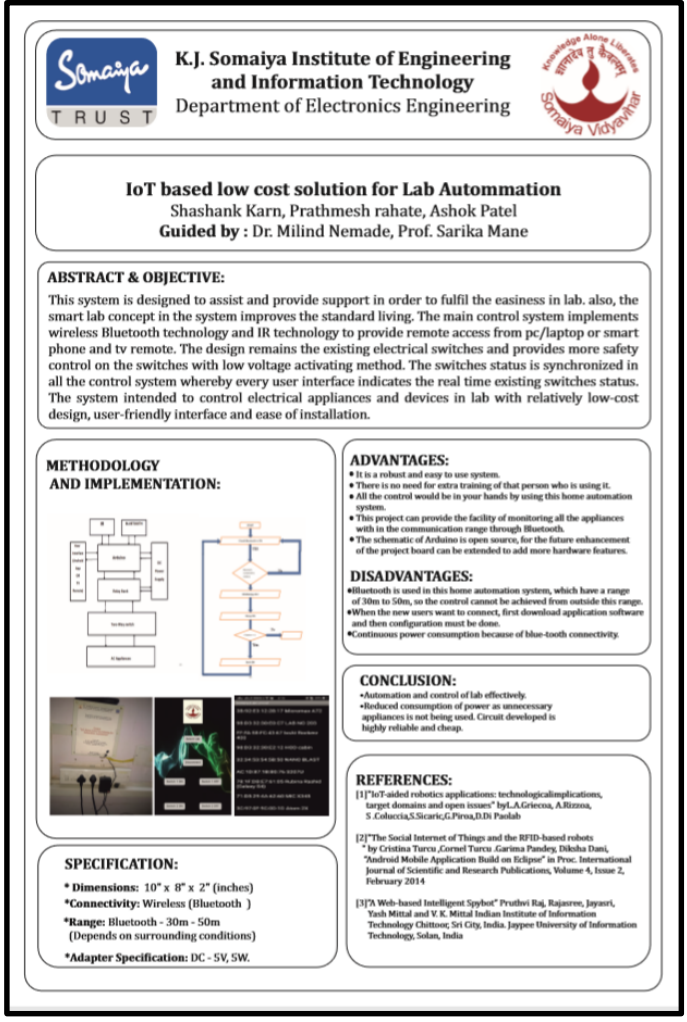
Name of the project: IoT Based Low Cost Solution for Laboratory Automation

Investigators: Dr. Milind Nemade, Mrs.Sarika Mane

Domain: Education

Year : 2016-17

Status : Completed



K.J. Somaiya Institute of Engineering and Information Technology
Department of Electronics Engineering

IoT based low cost solution for Lab Autommation

Shashank Karn, Prathmesh rahate, Ashok Patel
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

This system is designed to assist and provide support in order to fulfil the easiness in lab. also, the smart lab concept in the system improves the standard living. The main control system implements wireless Bluetooth technology and IR technology to provide remote access from pc/laptop or smart phone and tv remote. The design remains the existing electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intended to control electrical appliances and devices in lab with relatively low-cost design, user-friendly interface and ease of installation.

METHODOLOGY AND IMPLEMENTATION:

ADVANTAGES:

- It is a robust and easy to use system.
- There is no need for extra training of that person who is using it.
- All the control would be in your hands by using this home automation system.
- This project can provide the facility of monitoring all the appliances with in the communication range through Bluetooth.
- The schematic of Arduino is open source, for the future enhancement of the project board can be extended to add more hardware features.

DISADVANTAGES:

- Bluetooth is used in this home automation system, which have a range of 30m to 50m, so the control cannot be achieved from outside this range.
- When the new users want to connect, first download application software and then configuration must be done.
- Continuous power consumption because of blue-tooth connectivity.

CONCLUSION:

- Automation and control of lab effectively.
- Reduced consumption of power as unnecessary appliances is not being used. Circuit developed is highly reliable and cheap.

REFERENCES:

[1]"IoT-aided robotics applications: technologicalimplications, target domains and open issues" byL.A.Griecoa, A.Rizzoa, S .Colucciа,S.Sicaric,G.Piroa,D.Di Paolab

[2]"The Social Internet of Things and the RFID-based robots " by Cristina Turcu ,Cornel Turcu ,Garima Pandey, Diksha Dani, "Android Mobile Application Build on Eclipse" in Proc. International Journal of Scientific and Research Publications, Volume 4, Issue 2, February 2014

[3]"A Web-based Intelligent Spybot" Pruthvi Raj, Rajasree, Jayasri, Yash Mittal and V. K. Mittal Indian Institute of Information Technology Chittoor, Sri City, India. Jaypee University of Information Technology, Solan, India

SPECIFICATION:

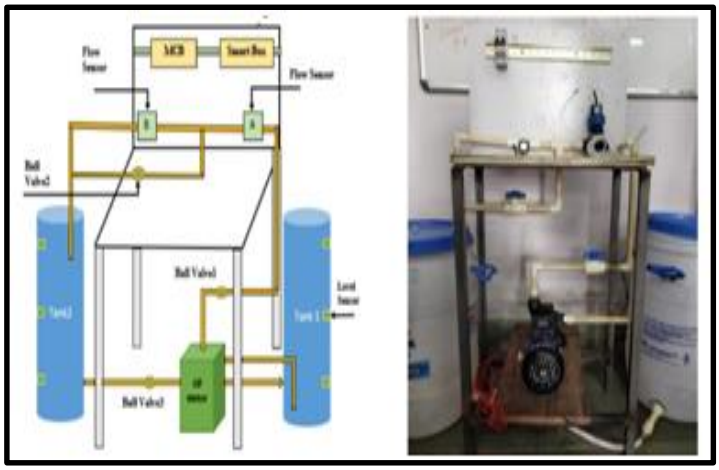
- **Dimensions:** 10" x 8" x 2" (inches)
- **Connectivity:** Wireless (Bluetooth)
- **Range:** Bluetooth - 30m - 50m (Depends on surrounding conditions)
- **Adapter Specification:** DC - 5V, 5W.

Name of the project: Smart Industrial process Monitoring And Control system

Investigators: Mrs. Sarika Mane

Domain: Education
Year : 2018-19

Status : Completed



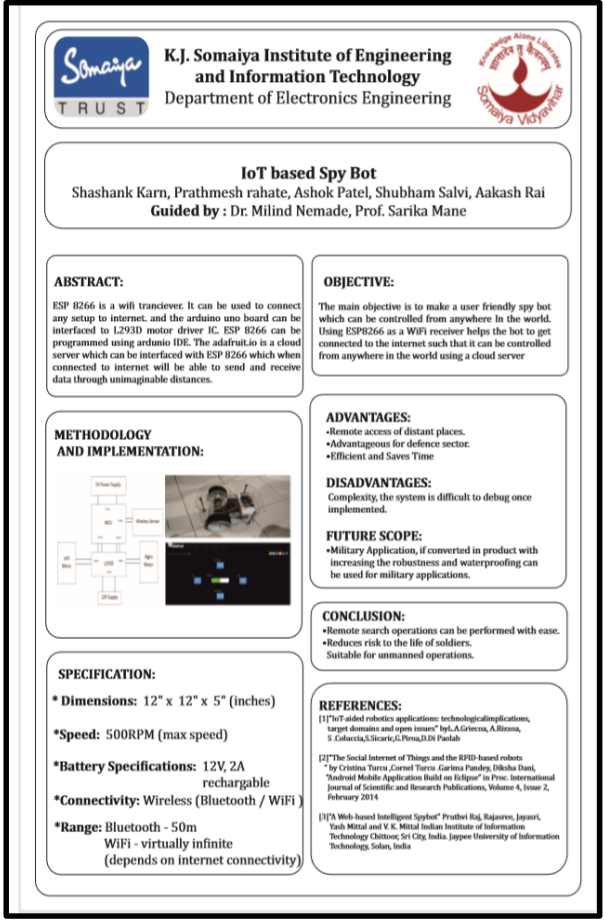
Name of the project: IoT based Spy Bot

Investigators: Dr. Milind Nemade, Mrs. Sarika Mane

Domain: Education/Robotics

Year : 2016-17

Status : Completed



K.J. Somaiya Institute of Engineering and Information Technology
Department of Electronics Engineering

IoT based Spy Bot

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT:

ESP 8266 is a wifi tranciever. It can be used to connect any setup to internet. and the arduino uno board can be interfaced to L293D motor driver IC. ESP 8266 can be programmed using ardunio IDE. The adafruit.io is a cloud server which can be interfaced with ESP 8266 which when connected to internet will be able to send and receive data through unimaginable distances.

OBJECTIVE:

The main objective is to make a user friendly spy bot which can be controlled from anywhere In the world. Using ESP8266 as a WiFi receiver helps the bot to get connected to the internet such that it can be controlled from anywhere in the world using a cloud server

METHODOLOGY AND IMPLEMENTATION:

ADVANTAGES:
- Remote access of distant places.
- Advantageous for defence sector.
- Efficient and Saves Time

DISADVANTAGES:
Complexity, the system is difficult to debug once implemented.

FUTURE SCOPE:
- Military Application, if converted in product with increasing the robustness and waterproofing can be used for military applications.

CONCLUSION:
- Remote search operations can be performed with ease.
- Reduces risk to the life of soldiers. Suitable for unmanned operations.

SPECIFICATION:

* **Dimensions:** 12" x 12" x 5" (inches)
* **Speed:** 500RPM (max speed)
* **Battery Specifications:** 12V, 2A rechargable
* **Connectivity:** Wireless (Bluetooth / WiFi)
* **Range:** Bluetooth - 50m
  WiFi - virtually infinite
  (depends on internet connectivity)

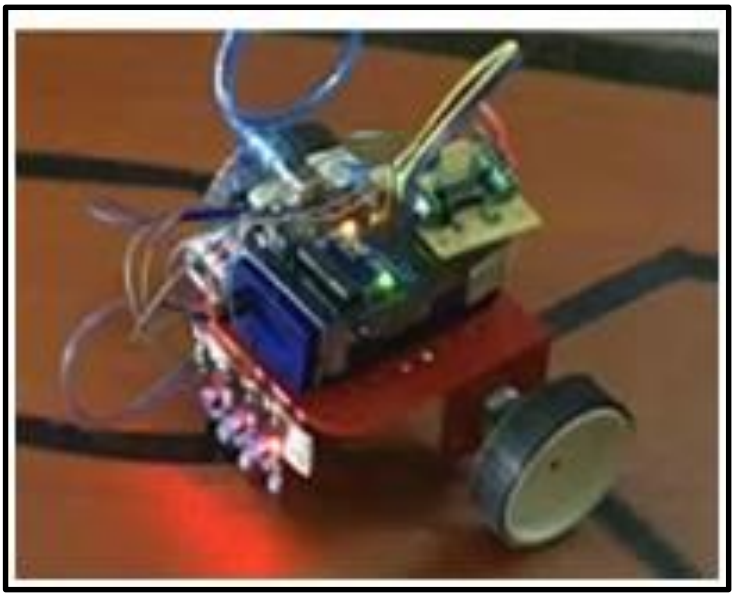
REFERENCES:

[1]"IoT-aided robotics applications: technologicalimplications, target domains and open issues" byL.A.Griecoa, A.Rizzoa, S. Colucciа,S.Sicaric,G.Piroa,D.Di Paolab

[2]"The Social Internet of Things and the RFID-based robots " by Cristina Turcu ,Cornel Turcu .Garima Pandey, Diksha Dani, "Android Mobile Application Build on Eclipse" in Proc. International Journal of Scientific and Research Publications, Volume 4, Issue 2, February 2014

[3]"A Web-based Intelligent Spybot" Pruthvi Raj, Rajasree, Jayasri, Yash Mittal and V. K. Mittal Indian Institute of Information Technology Chittoor, Sri City, India. Jaypee University of Information Technology, Solan, India

Name of the project: Automatic Line Following Robot



Investigators: Mrs. Sarika Mane

Domain: Education/Robotics

Year : 2016-17

Status : Completed

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Department of Electronics Engineering

Autonomous Floor Cleaning Robot with Obstacle Avoidance Technology

Mayur Bhanushali, Ajay Gaikwad, Pranay Dhongade, Soumitra Athalye

Principal Investigator: Mrs. Medha Asurlekar

Minor Research Project No: 1055 sanctioned by University of Mumbai for the year 2019-20

Abstract

Autonomous Floor Cleaning Robot is vacuum cleaner with reliable and cost effective navigation system. The core idea behind the project is to minimize the cost. Nowadays, due to fast and hectic lifestyle, it is difficult to spare time for cleaning purposes. This problem is solved by our robot. The robot follows various algorithms for area mapping and optimized cleaning. These algorithms try to reduce cleaning period and eliminate human intervention as much as possible.

Need of the project

Keeping your home beautifully clean every day is hard but important work. Dust dirt and hair build-up everywhere which can be cleaned by taking the aid of a traditional vacuum cleaner. Vacuum cleaners are bulky, cumbersome machines that are often hard to move around the home. Moreover, in the case of an upright vacuum cleaner, it is almost impossible to move up and downstairs. The vacuum cleaner was manufactured in a fairly large size, although not heavy. Moving and storing this device will require a big place. Depending on the vacuum cleaner model uses hundreds to thousands of watts of electricity. Absolutely, if you use a vacuum cleaner, your electricity bill starts running. Cleaning with a vacuum cleaner also requires human intervention. These lead to the loss of time which could have been utilized more productively.

Objectives

- To design and develop low cost Automated Robotic Vacuum cleaner.
- To clean the given room effectively.

Implementation

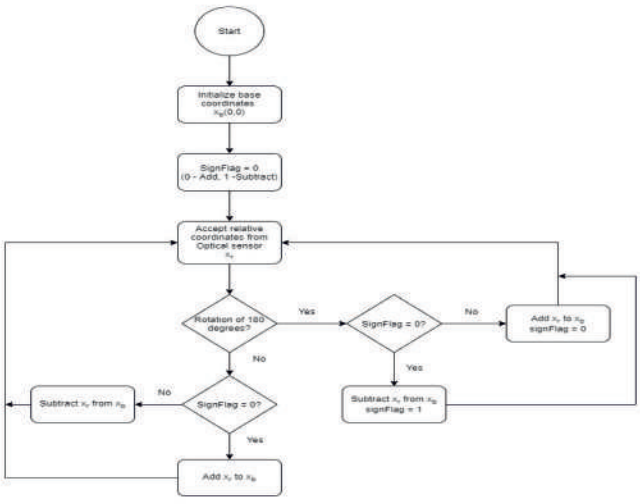

Figure 1: Flow Chart

Figure 2: Autonomous Floor cleaning Robot

Applications

- Hygiene in Hospitals is very important hence AFCR can clean it from time to time
- AFCR can be used to clean the railway platforms every day at night time when the crowd is minimum.

Advantages

- Using AFCR can save up to 5-6 hours of time for a person per week.
- AFCR can also be helpful to elderly people to clean their home saving their back pain.
- Cost of the AFCR is almost half of the vacuum cleaners that are available in the market , so it is also affordable .

Conclusion

Keeping your home beautifully clean every day is hard but important work, dust dirt and hair build-up everywhere so for cleaning floors throughout your entire home at the push of a button we designed the Autonomous Floor Cleaning Robot it is designed to help you stay ahead of everyday. Its advanced navigation system seamlessly navigates working non-stop until your home is beautifully clean. A full suite of sensors and a optical mouse system help the AFCR map your home as it cleans so it always knows exactly where it is where it's been and where it needs to go. It is designed for real homes and large scale industries inspired by various vacuum cleaners present in the market.

References

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2. Yan Wang, Wei-Lun Chao, Divyansh Garg, Bharath Hariharan, Mark Campbell, and Kilian Q. Weinberger, "Pseudo-LiDAR from Visual Depth Estimation: Bridging the Gap in 3D Object Detection for Autonomous Driving", Computer Vision Foundation.
3. Iwan Ulrich, Francesco Mondada, J.D Nidoud, Autonomous Vacuum Cleaner, Robotics and Autonomous Systems, March 2007.
4. T.B. Asafa, T.M. Afonja, E.A. Olaniyan, Development of a vacuum cleaner robot, Alexandria University Journal, 2018.

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Department of Electronics Engineering

Deadstock Lab Inventory Management System

Varshil Jain, Kavya Kunder, Ayushi Bardiya, Shrejay Patil
Guided By: Prof. Vidya Sagvekar

Abstract

Equipment management is an important issue for the safety and cost in an institute. In addition, the use of an efficient information system effectively promotes the processing performance. The maintenance of deadstock's information using paperwork is very difficult in terms of time. Deadstock management system can be used for different departments. The system is web based and uses intranet approach for communication between different users of the system. Through the related application, it has efficiently improved operation such as addition, modification and deletion of dead stock information. The system can be used to improve the work quality, reduce the maintenance cost.

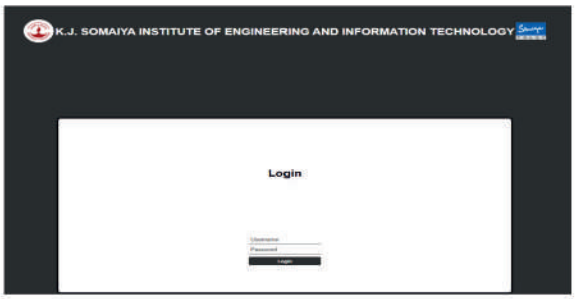
Need of the project

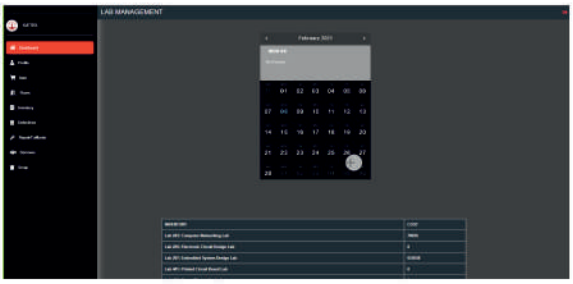
It is important to keep a track record of all the items present in a department's inventory in order to maintain it. Paper work is more hectic, and our project aims to remove all the paper work in order to provide a web-based client system for easy user interface.

Objectives

- To create a centralize system through web to eliminate paper work.
- To add, delete and modify items in an inventory and to keep a track record of it
- To distinguish between defective and scrap and add items to the repair column.

Implementation





Applications

- Deadstock lab inventory management systems.
- Laboratory inventory management system.
- Library inventory management systems.
- Industrial inventory management systems

Advantages

- Easy to use
- Enable workflow automation which can in turn reduce human error
- Centralize access and storage of quality control data

Conclusion

Inventory management is important for keeping costs down, while meeting regulations. Supply and demand is a delicate balance in inventory management hopes to ensure that the balance is undisturbed. We have successfully completed this project and it is under use by our department.

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1. Addam, Neha, et al. "A Framework for Dead stock Management System for in-house computer engineering department."
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6. https://www.javatpoint.com/mysql-tutorial

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Department of Electronics Engineering

E Transcript System

Saikat Duttaroy, Sushant Devgonde, Vivek Parmar, Nayan Chordiya, Deep Bhagat
Guided By: Dr. Milind Nemade

Abstract

The above-mentioned project is a complete automated process for the application of Transcript. The complete process involves online payment of fees, Transcript form filling followed by three stages of verification from the officials and then finally generating the final transcript dynamically and being mailed to the applicant. At every stage of the system mails are being sent to all the admins and the applicant regarding the status of the transcript. We also have a reupload feature for the admins so that if there is any major change then they can make the change from their side and can reupload the documents. Apart from the mails the applicant can also check the status of the transcript by logging into the student portal of the system.

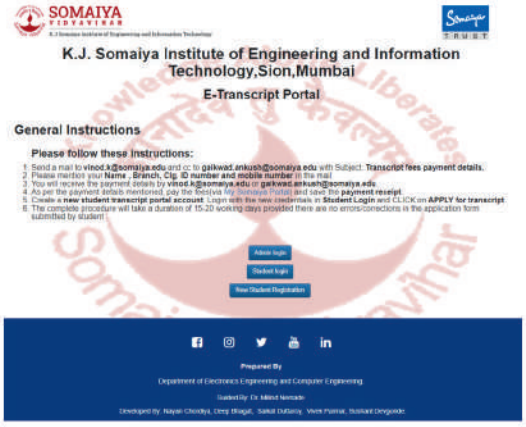
Need of the project

Due to the corona virus pandemic every thing was carried on virtually and as the transcript system was manual in our college it was becoming a very difficult task for the staff and the students to get the transcript on time. This led us to the idea of developing a software that will make the above mentioned process virtual or online.

Objectives

- To design a system which will collect the data from the students and automatically develop a transcript .
- To develop a system where the admins can check the data entered.

Implementation



Advantages

- Manual and tedious work of the staff is reduced.
- Processing of transcript made easy and convenient for students.
- Easy to use.
- Paper is saved

Applications

- E-Governance
- Electronic Document Issuance
- Interdepartmental Verification

Conclusion

We have successfully implemented the project in the college . It is working without any error and has been able to fulfil the objective it was made for. This project has reduced the work of the office staff and made it easy for the students to get the transcripts. This project has completely reduced the manual work of the admins.

Project Link :
http://kjsieit.in/etranscripts/new_reg/registration.php

References

1. Dongre, Amitesh, et al. "E-IDOL: E-way of Issuing Document Online." International Journal of Computational Engineering Research (IJCER).
2. Kim, Jongweon, Kyutae Kim, and Jonguk Choi. "Technologies for online issuing service of documents." International Conference on Web Information Systems Engineering. Springer, Berlin, Heidelberg, 2004.

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Department of Electronics Engineering

Environmental Friendly Solar Grass Cutter

Nikhil Bhujbal, Tanmay Balodi, Rahul Goregaonkar, Karan Doshi
Principal Investigator: Mrs. Sheetal Jagtap
Minor Research Project No: 520 sanctioned by University of Mumbai for the year 2019-20

Abstract

Currently, manually handled devices works on non- renewable sources of energy. Automatic solar grass cutter focuses on the use of renewable source of energy which will help to reduce the emission of harmful gases which are emitted by the conventional grass cutter. Automatic solar grass cutter requires low maintenance and less human interface as compared to conventional grass cutter. Recently we are facing problems like air pollution, noise pollution, power cut problems, etc. In order to overcome these problems conventional grass cutter can be replaced by automatic solar grass cutter which is environmental friendly. In this project IR Proximity sensor are used to detect and avoid object/animal/human while operating. This machine consist of battery which charges simultaneously while operating. If the climatic conditions are not suitable for the solar panel to generate power and if the user wants to operate the machine at that time, then there is an alternative source of power through battery. Power consumption in this machine is less as compared to conventional grass cutter. The movement of the machine is totally controlled by automatic mode and manual mode.

Need of the project

Nowadays, manually operated traditional engine based grass cutter are used. Over the field traditional grass cutting machine can create pollution and loss of energy. Automatic solar grass cutter will reduce the effort required for cutting the grass in the lawns.

Objectives

- To make use of a renewable source of energy in a grass cutter design.
- To reduce air & noise pollution.
- To overcome the problem of traditional grass cutter

Implementation

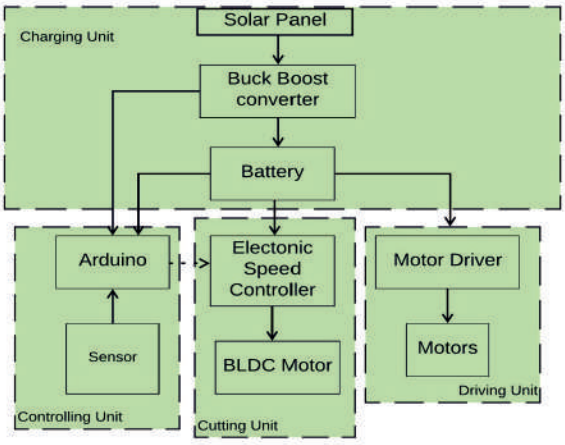

Figure 1:System Flow Chart

Figure 2: Solar Grass Cutter

Applications

- Garners for cutting the grass without use of fuel and electricity.
- Main Target is to reduce human efforts, main stakeholders are gardeners of gardens.

Advantages

- Less efforts
- less pollution
- Fuel saving means money saving
- No noise pollution

Conclusion

Due to power demand we choose solar energy which is a renewable source of energy and hence there is no running cost. Our project entitled Android app operated solar powered grass cutter is successfully completed and results obtained are satisfactory. This project is more suitable as it is having much more advantages i.e. no fuel cost, no pollution and no fuel residue. This system is having a facility of charging the batteries while the solar grass cutter is in motion. The DC motor in low power with high efficiency. This project eliminates the physical power required in pushing without sacrificing safety.

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Department of Electronics Engineering

Field Monitoring Autonomous Drone (FMAD)

Saikat Duttaroy, Saurabh Kadam, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade

Abstract

Agricultural production is one of the key factors in the stability of the global economy. Correct and timely use of pesticides and proper observation of the crops provides an additional favorable atmosphere for crops to grow that eventually results in good agricultural production. FMAD is a system that is capable of spraying pesticides automatically over the agricultural land and also collect images and record videos of the field for further monitoring using various spectral imaging techniques. FMAD increases the efficiency and also minimizes the manual work of the farmer to spray pesticides and monitor the field which indeed becomes very beneficial for the farmer.

Objectives

- To decrease human intervention while spraying pesticides as it has harmful effects.
- To make pesticide spraying faster and rapid.
- To prevent the unnecessary wastage of pesticides.
- To monitor the health of the crops remotely.
- To provide an efficient spraying system.

Circuit Diagram

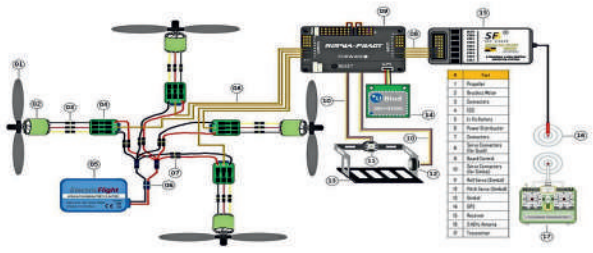

Figure 1: FMAD Circuit Diagram

Implementation

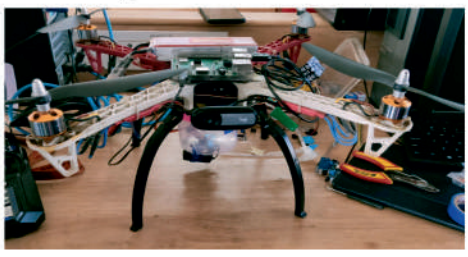

Figure 2: FMAD Prototype

Applications

- Horticulture has defined as the Agriculture of the crops. In this most of the crops are vegetables, fruits and flowers. This kind of crops have short life and also need daily monitoring which will be difficult for single person to monitor the large field.
- We can also use this F-MAD for the monitoring the plants of fruits like mango, cocoanut, lemon, guava, etc.
- We can use this F-MAD for non-horticulture plants like Tea, Tabaco & coffee farming in mountain regions of India.

Conclusion

- The proposed system has the potential to improve agricultural production at a very low cost and with ease.
- Agriculture Drone can help the farmers to transform the agriculture industry.
- Now a day's farmers use a hand pump for spraying pesticides. Human beings take a large amount of time to spray the crops and they don't uniformly spray the pesticides.
- Human being charges 100/- to 200/- rupees per day for pesticide spraying, as compared to them drone takes 3 watts of power then it will charge 10/- rupees only of electricity.
- The drone will uniformly spray the fertilizers hence; there is no possibility of damaging crops.
- Hence, the drone will minimize the efforts of farmers for agriculture purposes. While designing the required circuitry it is very necessary to follow all the design and development steps for PCB designing

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3. F. Mohamadi, "Vertical takeoff and landing (VTOL) small unmanned aerial system for monitoring oil and gas pipelines", Nov. 2014.
4. Agriculture and development a part of Economic systems Volume 36 Issue 2 by Jean-JacquesDethier AlexandraEffenberger.
5. https://sisu.ut.ee/imageprocessing/book/1

Award

- First Prize KJSIEIT Campus Hackathon.
- First Prize in Innovative Business plan organized by MHRD's Innovation Cell.

K.J. Somaiya Institute of Engineering and Information Technology
Department of Electronics Engineering

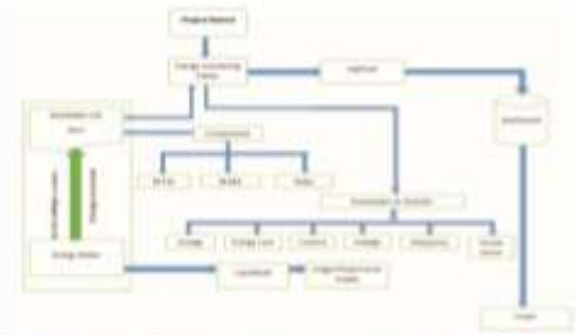
IoT based Energy management system for industrial application

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

The designed system monitors the parameters of the appliances or devices that are used in industries. The parameters which are monitored are power factor, current, energy consumed, voltage and the estimated cost of energy consumed. The bills of energy consumed can be managed by pre-setting the amount by a user & if the amount reaches the limit the alert alarm notification will be sent to a user. The system can be analysed and monitored remotely.

METHODOLOGY AND IMPLEMENTATION:



FEATURES OF THE SYSTEM:

- The system is very much accurate and can give very accurate results in future.
- The cost of the system designed by us is cheaper than the existing system in market.
- This monitoring system is easily portable.
- Industries & residential field can get great benefit by this system.
- The power can be saved by monitoring and managing.
- The system is more reliable and durable.

SPECIFICATION:

- **Dimensions:** 12" x 10" x 2" (inches)
- **Connectivity:** Wireless (WiFI)
- **Range:** Virtually unlimited (Depends on internet connectivity)
- **Adapter Specification:** DC - 5V, 5W.

CONCLUSION:

- Automation , control and monitoring of industrial appliances.
- Reduced consumption of power as unnecessary appliances is not being used. Circuit developed is highly reliable and cheap. accurate billing system provided

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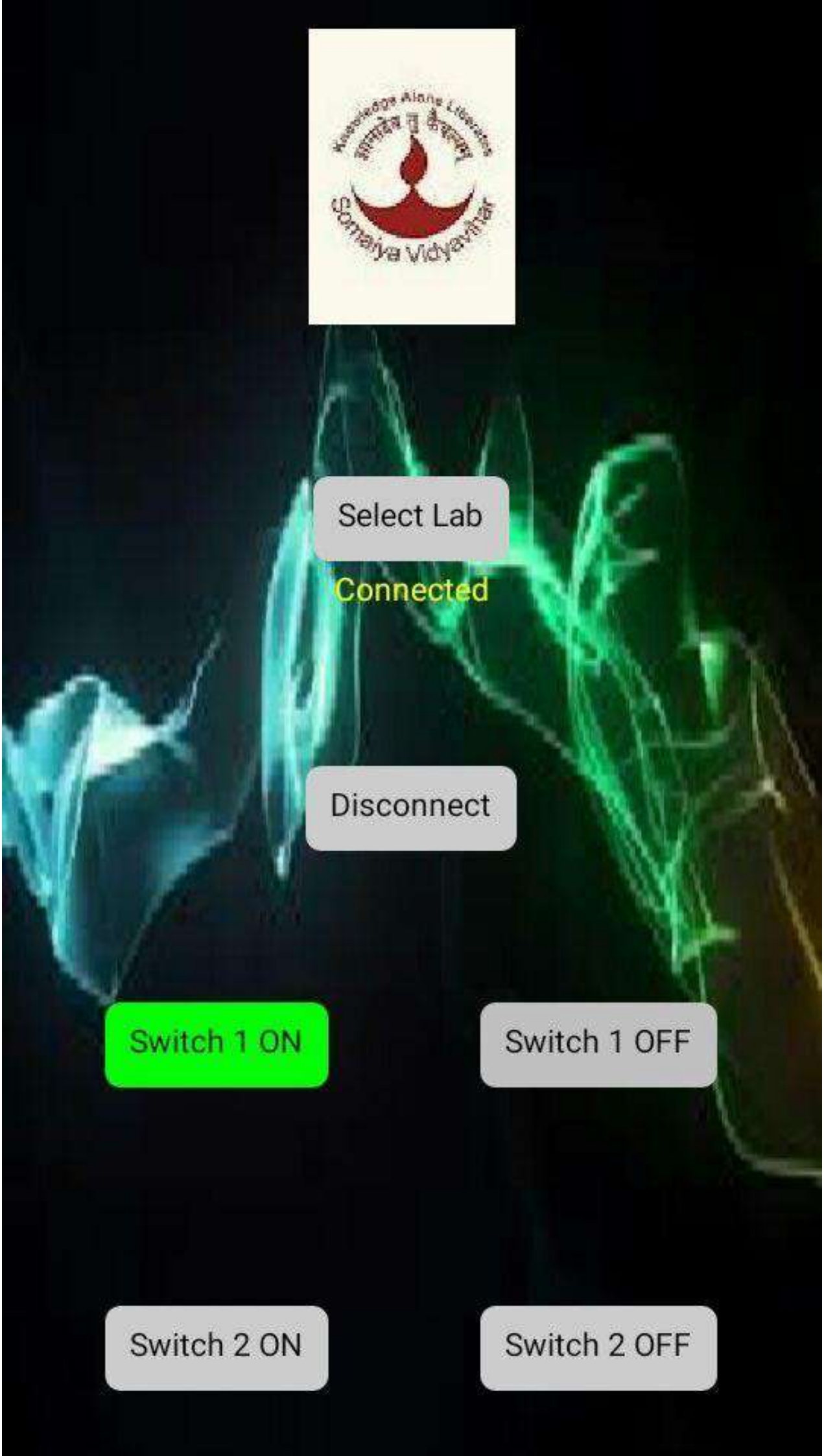
Select Lab
Connected
Disconnect
Switch 1 ON
Switch 1 OFF
Switch 2 ON
Switch 2 OFF

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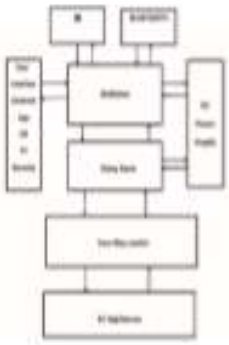
IoT based low cost solution for Lab Autommation

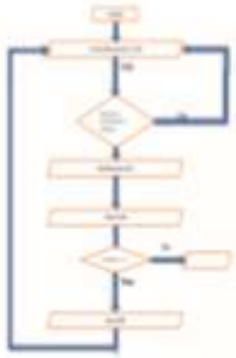
Shashank Karn, Prathmesh rahate, Ashok Patel
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

This system is designed to assist and provide support in order to fulfil the easiness in lab. also, the smart lab concept in the system improves the standard living. The main control system implements wireless Bluetooth technology and IR technology to provide remote access from pc/laptop or smart phone and tv remote. The design remains the existing electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intended to control electrical appliances and devices in lab with relatively low-cost design, user-friendly interface and ease of installation.

METHODOLOGY AND IMPLEMENTATION:





ADVANTAGES:

- It is a robust and easy to use system.
- There is no need for extra training of that person who is using it.
- All the control would be in your hands by using this home automation system.
- This project can provide the facility of monitoring all the appliances with in the communication range through Bluetooth.
- The schematic of Arduino is open source, for the future enhancement of the project board can be extended to add more hardware features.

DISADVANTAGES:

- Bluetooth is used in this home automation system, which have a range of 30m to 50m, so the control cannot be achieved from outside this range.
- When the new users want to connect, first download application software and then configuration must be done.
- Continuous power consumption because of blue-tooth connectivity.

CONCLUSION:

- Automation and control of lab effectively.
- Reduced consumption of power as unnecessary appliances is not being used. Circuit developed is highly reliable and cheap.

SPECIFICATION:

- **Dimensions:** 10" x 8" x 2" (inches)
- **Connectivity:** Wireless (Bluetooth)
- **Range:** Bluetooth - 30m - 50m (Depends on surrounding conditions)
- **Adapter Specification:** DC - 5V, 5W.

REFERENCES:

[1]"IoT-aided robotics applications: technologicalimplications, target domains and open issues" byL.A.Griecoa, A.Rizzoa, S .Coluccia,S.Sicaric,G.Pirroa,D.Di Paolab

[2]"The Social Internet of Things and the RFID-based robots " by Cristina Turcu ,Cornel Turcu ,Garima Pandey, Diksha Dani, "Android Mobile Application Build on Eclipse" in Proc. International Journal of Scientific and Research Publications, Volume 4, Issue 2, February 2014

[3]"A Web-based Intelligent Spybot" Pruthvi Raj, Rajasree, Jayasri, Yash Mittal and V. K. Mittal Indian Institute of Information Technology Chittoor, Sri City, India. Jaypee University of Information Technology, Solan, India

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IoT based Real Time Data Monitoring and Notification for Agricultural Application (Farm IoT)

Alok Mahanto, Sri Harsha Movva

Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

India being an agricultural country, maximum rural area population is indulge in farming as their main occupation for their living but the main problem with farming are as follow. There is uncertainty of the weather and water irrigation to the farm land which lead to decrease in the yield of the crops due to excess or over water supplied to the crops. The prediction of soil moisture, temperature and other parameters related the crop cannot be made accurately by the farmers and hence making an irregular schedule of the nourishment provided to the crops. All the product that provide solution to this problem will be costly and rural people cannot afford it while the installation of such a big system will be problem and this system don't come out to be user friendly when thought about the normal farmers. Thus we designed a system that can solve this issue and can be available at a lower cost.

Need of the project

To meet the high food demand, Agriculture will no longer depend on applying traditional methods. Instead, farmers will have to get equipped with the latest farming technologies. These advanced devices and precision agriculture and robotic systems will allow farms to be more profitable, efficient, safe, and environmentally friendly .

Objectives

- To Track the condition of the soil present and taking the proper action against it making sure that the crops are maintained in ideal manner.
- System must be user friendly and will be made in much lesser price as compared to all other existing systems.

Implementation

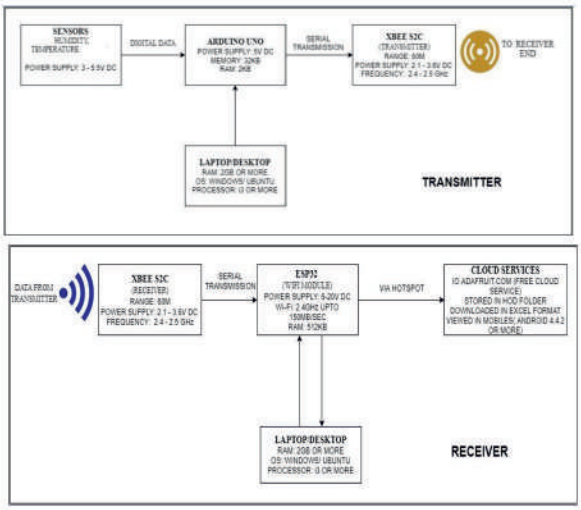

Figure 1: System Block Diagram

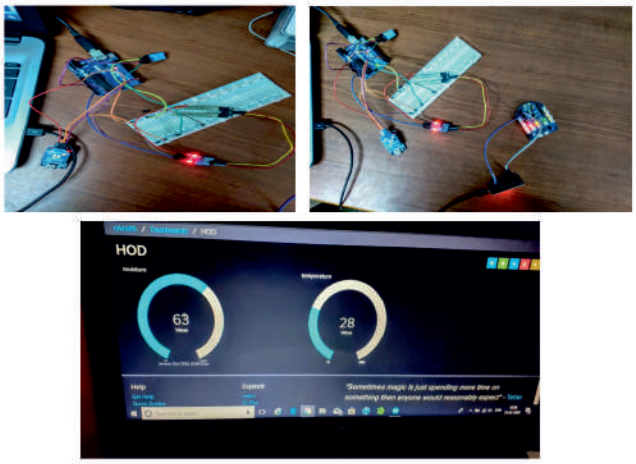

Figure 2: System Components and Parameter Display

Applications

- Different types of plants like flowers, fruits and vegetables require daily monitoring. We can monitor different fruits like mango, coconut, lemon using this system.
- Can be used in Tea and Coffee farming.
- Can be used in other industrial fields like in boilers, chemical tanks etc.

Advantages

- Low cost system.
- Low power consumption.
- Easy to use and a clean UI.
- Can monitor using smartphones.

Conclusion

This system will be helpful to all farmers for their cultivation and farming by understanding the different soil fertility parameters. It helps in keeping the proper records of the land specifying the condition of the land in different weather conditions. Records will help in better planning for fertilizer application in crops.

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IoT based Spy Bot

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

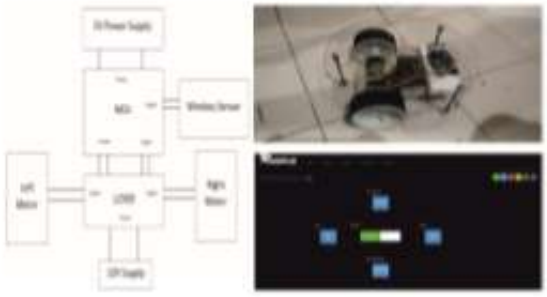
ABSTRACT:

ESP 8266 is a wifi tranciever. It can be used to connect any setup to internet. and the arduino uno board can be interfaced to L293D motor driver IC. ESP 8266 can be programmed using ardunio IDE. The adafruit.io is a cloud server which can be interfaced with ESP 8266 which when connected to internet will be able to send and receive data through unimaginable distances.

OBJECTIVE:

The main objective is to make a user friendly spy bot which can be controlled from anywhere in the world. Using ESP8266 as a WiFi receiver helps the bot to get connected to the internet such that it can be controlled from anywhere in the world using a cloud server

METHODOLOGY AND IMPLEMENTATION:



ADVANTAGES:

- Remote access of distant places.
- Advantageous for defence sector.
- Efficient and Saves Time

DISADVANTAGES:

Complexity, the system is difficult to debug once implemented.

FUTURE SCOPE:

- Military Application, if converted in product with increasing the robustness and waterproofing can be used for military applications.

CONCLUSION:

- Remote search operations can be performed with ease.
- Reduces risk to the life of soldiers.

Suitable for unmanned operations.

SPECIFICATION:

*** Dimensions:** 12" x 12" x 5" (inches)

***Speed:** 500RPM (max speed)

***Battery Specifications:** 12V, 2A rechargable

***Connectivity:** Wireless (Bluetooth / WiFi)

***Range:** Bluetooth - 50m
WiFi - virtually infinite
(depends on internet connectivity)

REFERENCES:

[1]"IoT-aided robotics applications: technologicalimplications, target domains and open issues" byL.A.Griecna, A.Rizzna, S .Coluccia,S.Sicaric,G.Pirna,D.Di Paolab

[2]"The Social Internet of Things and the RFID-based robots " by Cristina Turcu ,Cornel Turcu .Garima Pandey, Diksha Dani, "Android Mobile Application Build on Eclipse" in Proc. International Journal of Scientific and Research Publications, Volume 4, Issue 2, February 2014

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Laser Engraver

Principal Investigator: Prof. Sejal Shah **Co-Investigator: Dinal Varma, Raj Raikar, Jay Bhanushali, Nilay Takarkhede**

(Minor Research Project No.Uom/1083 sanctioned by University of Mumbai for the year 2019-2020)

Abstract

Nowadays technology is increased in rapid growth the usage and implementation of CNC systems in industries and colleges but at greater cost. According to our idea on fabrication of compact and cheap cost CNC Engraver is introduced to reduce complexity, cost and manpower. The design and implementation of two dimensional CNC router which can engrave 2D & Grey scaled images or pictures with help of high watt burning laser module on surface which can be a paper, wood, leather, plastic, foam. A device for engraving a two-dimensional graphic output from a computer on wood. Most of the engraver is designed in bi-directional movement and square type models. Whereas X-Y engraver design is concerned, axis movements are mounted on each other and belt driven mechanism for engraving. Laser engraver uses a very fine matrix of dots to form images, such that while a line may appear continuous to the naked eye, it in fact is a discrete set of points.

Need of the project

Many events are hosted by the Institute every year. For each of the events renowned speakers are invited. As a token of appreciation, speakers are handed a memento from the Institute. A customised engraved memento is very much appealing. A user friendly engraver is designed for the same. Besides the mementos, the engraver can be used to engrave equipment details in labs.

Objectives

- To create a system that is more user friendly.
- To achieve an accurate output compared to entry level engravers.
- To get a consistent output throughout the working of machine.

Implementation

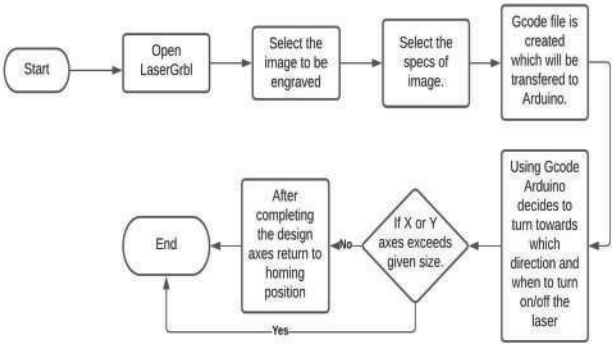

Figure 1: System Flow Chart

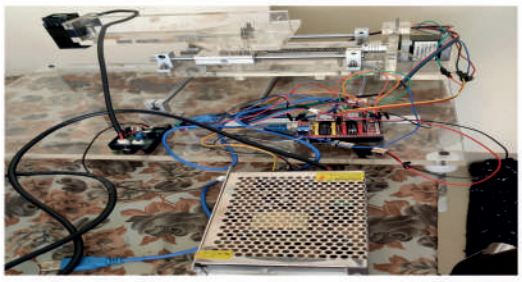

Figure 2: Laser Engraver Working Model

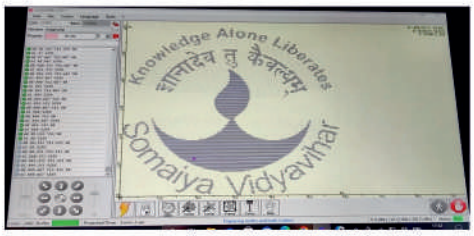

Figure 3: Universal Gcode Sender GUI

Advantages

- Low cost system.
- Low power consumption.
- Easy to use.

Applications

- It can be used in mass production of engraved certificates and signatures/trademarks.
- It can be used by designers to engrave various design with precision on different surfaces.
- It can be used as a low cost CNC machine for economical benefits.

Conclusion

Laser Engraver is accurately synchronized with the Arduino for better response on the measurement of X and Y axis. A laser engraver that operates in two axes of motion ('X' and 'Y') in order to draw vector graphics or text on given surface. Laser engraver uses a laser to plot the wood lying on the flat surface area of the engraver. The result obtained is an intricate design that is engraved on the surface and custom designs can be incorporated.

References

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3. Chen Yi Hong & Chen Wei Long, Tam Siu Chung, "Calculation of optoical parameter in laser engraving of photomasks"
4. Lin Li, "The advances and characteristics of high-power diode laser materials processing" Optics and Lasers in Engineering 34 (2000) 231\}253.

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Department of Electronics Engineering

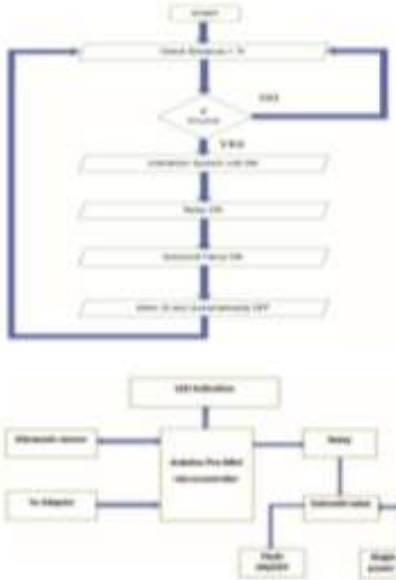
Automatic urnial flushing system

Shashank Karn, Prathmesh rahate, Ashok Patel, Shubham Salvi, Aakash Rai
Guided by : Dr. Milind Nemade, Prof. Sarika Mane

ABSTRACT & OBJECTIVE:

A flush urinal-urinal disposes human waste by using water through a drainpipe to another location. A series of urinal-urinal are fitted in offices, malls, multiplexes, educational institutions, bus railway stations, airports, commercial complexes, stadia and other public places. Most have manual flushing systems like push button, trigger, pull chain, etc. however, use of such manually operated flush can spread germs and bacteria when contacted and thus users avoid to flush or lead to wastage of water if used. It creates bad odour and unpleasant environment especially in public places (colleges), which affects the health of the people using it.

METHODOLOGY AND IMPLEMENTATION:



COMPARISON WITH EXISTING SYSTEM:

Parameters	Existing System	Proposed System
Circuit complexity	More complex	Less complex
Circuit Design	More	Less
Component parts replaceable	Only few parts can be replaceable	All parts can be replaceable
System Price	7,000/- INR	1,000/- INR (without service charges)
Reliable	Moderate	More
Design System		

CONCLUSION:

Water is the universal resource and every living being has the right to access clean and hygienic water. It is our responsibility to pass this natural resource to the future generations. Measures have to be taken by everyone to save water by all possible means. This type of urinal flushing system could be incorporated in public places to provide clean, hygienic and comfortable use of restrooms, in addition to saving of water resource

REFERENCES:

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Noise Monitoring and Alert System for Library

Saikat Duttaroy, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

Noise is unwanted sound. Noise is one of the most common health hazards. Noise can cause hearing system disorders, disruption of concentration, stress, interference with speech communication, and increased blood pressure. Permanent hearing loss is the main health concern. Therefore, a measuring instrument is needed to monitor noise levels. The proposed system is designed to monitor the noise levels in the library and to maintain it by raising alarm when the sound level crosses the limit defined. The data acquisition system consists of an analog sound sensor V2, Arduino Uno, display LED, and display seven segment. Sound sensor serves to convert sound into electrical quantities. The microphone converts the sound pressure (Pa) to audio voltage (Volt). Noise detection using the sensor is a electret condenser microphone with sensitivity of -56 dB relative to 1 V/µbar. The output from the sound sensor is then connected to Arduino Uno. The measurement results are displayed in seven segments. The result show that at 1000 Hz frequency produces a sound pressure of 94 dB. In addition, there are six LED indicators.

Need of the project

Library is a place where the noise levels should be maintained all the time of the day but when the space is more it becomes difficult for the management staff to maintain the noise levels resulting in the disturbance to all the people present.

Objectives

- To design a system which automatically detects and controls the noise levels of a reading hall in a Library .
- To design a device which will produce a buzzing sound as the noise level increases beyond threshold.

Implementation

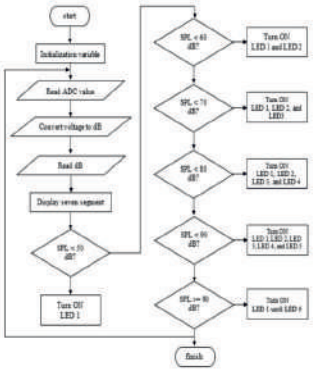

Figure 1: System Flow Chart

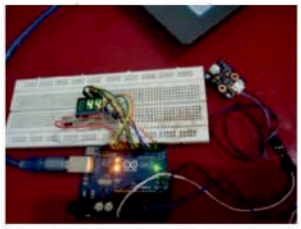

Figure 2: System Components

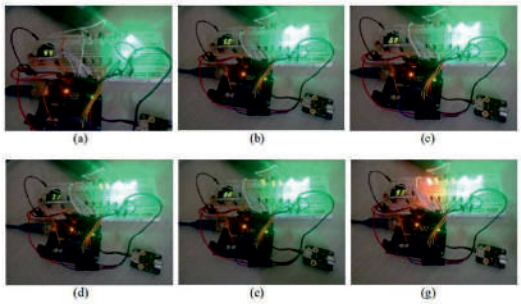

Figure 3: System Prototype

Applications

- Security Systems
- Burglar Alarms
- Device Control
- Door Alarms

Advantages

- Manual and tedious work of the staff to maintain noise levels is reduced.
- Cost effective.
- Easy to use and compact circuit.
- Low power requirement.

Conclusion

We have successfully implemented the project in the library of our college . It is working without any error and has been able to fulfil the objective it was made for. With the ability of the tool to measure the 44-94 dB range with notifications in six LED indicators. It was concluded that the designed device can work well.

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Department of Electronics Engineering

RFID Based Door Locking System for Library

Saikat Duttaroy, Sushant Devgonde, Vivek Parmar
Guided By: Dr. Milind Nemade, Prof. Sarika Mane

Abstract

This system is designed to assist and provide support in order to fulfil the easiness in the library. RFID, Radio Frequency Identification is an inexpensive technology, can be implemented for several applications such as security, asset tracking, people tracking, inventory detection, access control applications. The main objective of this system is to design and implement a digital security system which can deploy in secured zone where only authentic person can be entered. We implemented a security system containing door locking system using passive type of RFID which can activate, authenticate, and validate the user and unlock the door in real time for secure access. The advantage of using passive RFID is that it functions without a battery and passive tags are lighter and are less expensive than the active tags. A centralized system manages the controlling, transaction and operation task. The door locking system functions in real time as the door open quickly when user put their tag in contact of reader. The system also creates a log containing check-in and check-out of each user along with basic information of user.

Objectives

- To design a system which will be able to read RFID tags and grant access only to a valid user .
- To develop a system which will be able to open a locked door for a verified user and to raise an alarm if a false id is detected .
- To develop a system which is easy to use .
- To design a system which is cost effective and has low maintenance cost.

Implementation

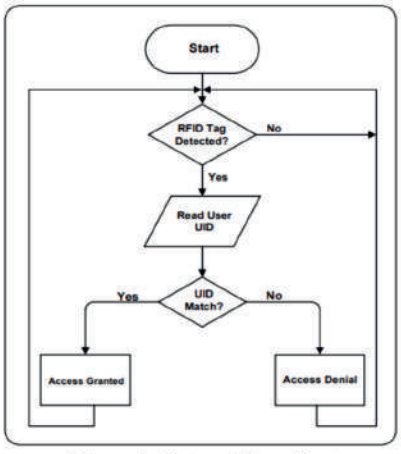

Figure 1: System Flow Chart

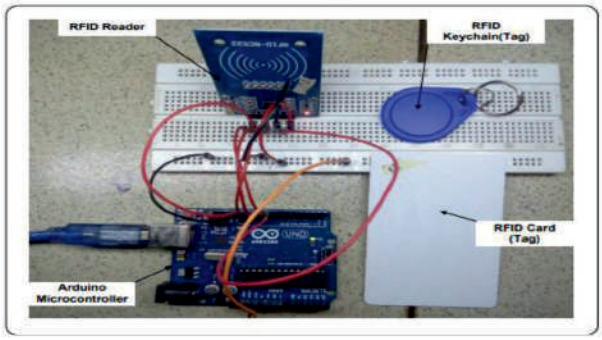

Figure 2: System Components

Applications

- We can use this project in schools or colleges, industries and offices .
- We can use this project in our home as well.
- This project is fully automatic and does not require any manual operation

Conclusion

A prototype of automatic access control system for use in an environment is successfully achieved. The system uses radio frequency identification (RFID) with Arduino technology to differentiate between authorized and unauthorized users. The RFID reader reads RFID tag issued to the user and matches it with stored UID on the Microcontroller. On a successful match, the microcontroller grants access or deny access if no match was found. An automatic access control system using Arduino and RFID has been prototyped and functioned as desired. The system can be installed at the entrance of a secured environment to prevent an unauthorized individual access to the environment.

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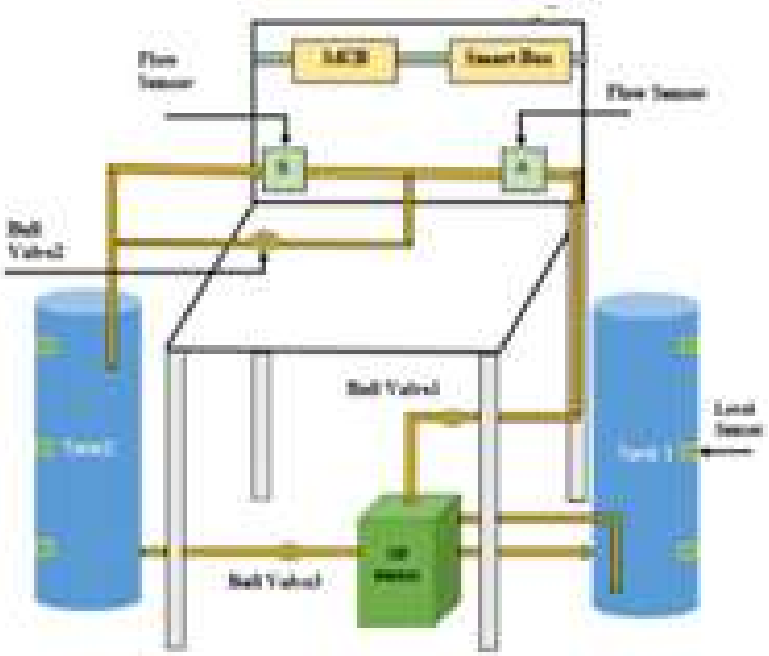
Flow Sensor
Flow Sensor
Ball Valve2
Ball Valve1
Level Sensor
Ball Valve3