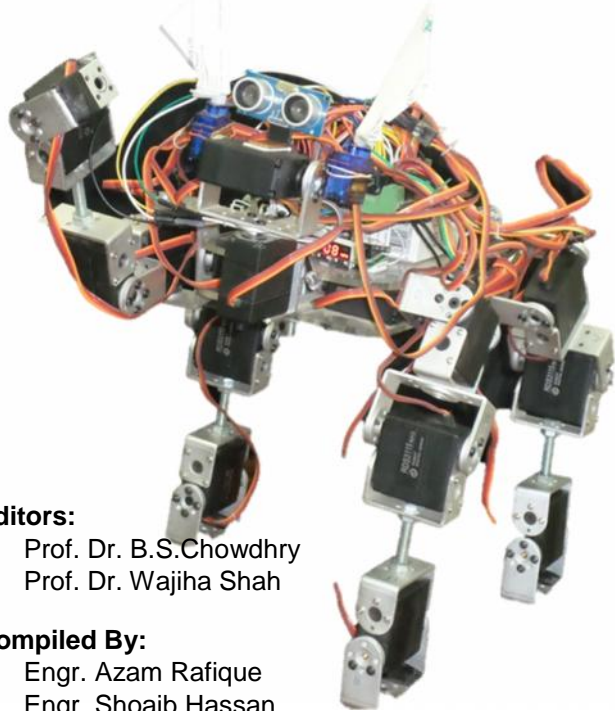




Final Year Projects 2015 (11ES)

Date: February 20, 2015



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Final Year Projects 2015 of 11ES

MESSAGE FROM THE DEAN FEECE



These past years have seen an interesting development in institution building in the country and amongst all institutions, the bedrock has been the education institutions that impart practical, technical and research based knowledge. Electronics in particular and ICT (Information and Communication Technologies) in general have a direct and great impact on our life. Electronic Engineering artifacts play major role in the evolution of mankind and culture. It is an increasingly

important engineering discipline that significantly affects the other disciplines of Engineering.

I am delighted to learn that Department of Electronic Engineering, as an innovative and forward looking department, achieved laurels for imparting quality education with practical skills that has been at the forefront in the country and its graduates have risen to positions of great eminence. The success of the department owes much to collaborative efforts involving faculty, administration, students, students' alumni and the community as a whole.

It is a matter of immense pleasure and happiness to see that students have made such remarkable projects such as Pet Bot, Automatic fuel monitoring, Tracking and theft detection system, Induction and solar system electric vehicle, Home energy management system. Equally important, projects such as Grid Based target Tracking of armed Soldier Robot, Smartphone controlled unmanned aerial vehicle, Smart Animal farm by IOT (internet of Things) and firefighting Robot are also worth mentioning.

On this occasion of the Departmental showcasing on the occasion of MUET Gala 2015, I would like to felicitate and express utmost appreciation to the Chairperson of the Electronics department, all faculty members and students for having kept up the standard of the department. The exhibition is indeed a matter of celebration for the university as well as for the country. The crux of the matter is that I am proud of department of Electronics Engineering and its performance.

Long live Mehran ! Pakistan Paindabad!

Prof. Dr Bhawani Shankar Chowdhry

MESSAGE FROM THE CHAIRPERSON

In today’s era of technological advancement, technical education plays a pivot role in the development of a country. The field of electronic Engineering has got overwhelming importance in almost every sphere of our lives and infact it is the driving force behind the development of world’s information technology.

It has deeply penetrated in every field of our existence. Our department vision is to be nationally recognized for high quality academic programs and research through focused activities and excellence of its faculty, staff, graduates and facilities.

We will achieve this vision through fostering the education of stellar students and contributing towards Electronic Engineering Research. This department aspires that its graduates solve the changes that many societies face today in such diverse areas ranging from information Technology to healthcare.

The final year students (11ES) of Electronic Engineering Department made remarkable efforts to make valuable final year projects such as Induction and Solar System Electric Vehicle , Pet Bot , GSM Based Advanced Notice Board Display and Development of search algorithm for Path Planning of Mobile Robot.

I would like to express my gratitude to all faculty members for their valuable suggestions and supervision to the final year students.

Prof. Dr. Wajiha Shah

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Development of Search Algorithm for Path Planning of Mobile Robot

Abstract:

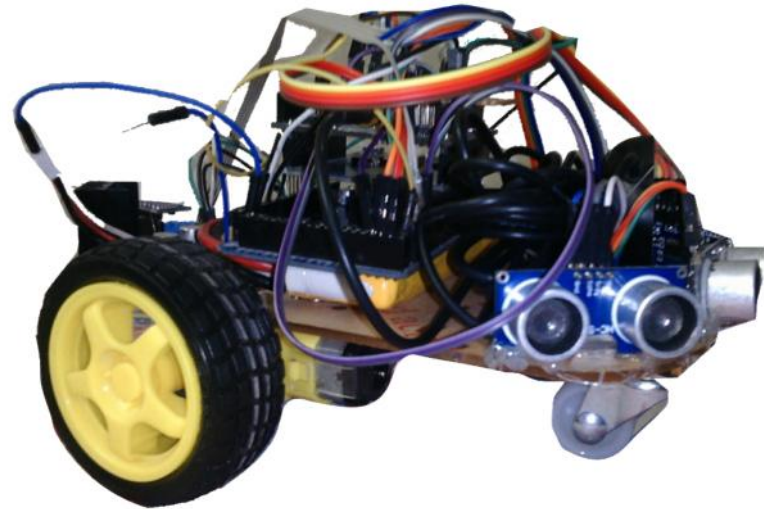
A three-wheel mobile Robot has been designed that will automatically reach the destination location without any human operator. The project has been divided in to two parts, one is mobile robot and other is laptop / communication section.

Robot section is composed of various sensors including digital compass, GPS, Ultrasonic sensors and wifi. And the function of communication section / laptop is to find the optimal path from current location of Robot to Destination location using Google Maps API.

After assigning the destination location to robot using communication section, the robot will send its current location to communication section and communication section will find the optimal route to destination from current location of Robot, and will instruct back the robot about the next route, direction and distance. The Robot after getting instructions from communication section moves in the specified direction. Along with moving in specified direction the robot also avoid any obstacles comes on the route, which google maps do not show on its maps.

Designed By:

- ◆ Sugandh Memon 11ES32
- ◆ Batool Memon 11ES06
- ◆ Kiran Memon 11ES11
- ◆ Murk Baloch 11ES13
- ◆ Shehnaz Lashari 11ES05



Supervised By:

- ◆ Prof. Dr. B.S.Chowdhry

Co-Supervised By:

- ◆ Engr. Zaigham Abbas Shah
- ◆ Engr. Azam Rafique Memon

*** This Project is funded by ICT R&D**

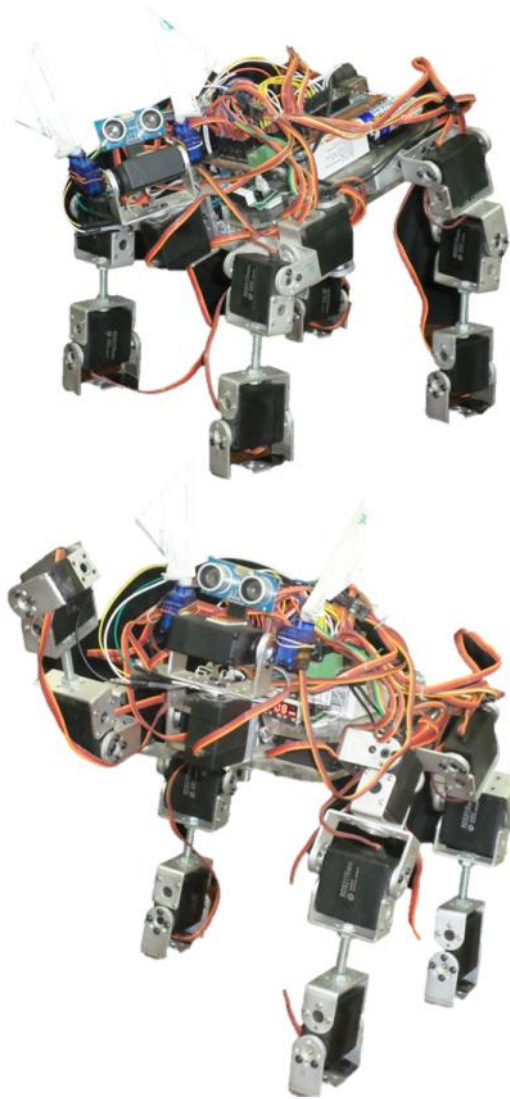
Pet-Bot

Abstract:

As Compared to the wheeled vehicles, legged robots are more capable to move across rough surface. The objective of this project was to design and implement a legged robot with RC servo motors operated by IR remote control. The robot should be able to walk straight ahead and make turns. Each leg of the robot was made up of servos. For operating servos we are using Arduino Mega smart board. This board would convert the number to a pulse-width modulated signal. Depending on the width of the pulse, a servo would rotate between 0 to 270 degrees. The structure of the robot was designed in such a way that it was used to coordinate motion of legs because it guaranteed that the robot would not fall over while walking. To save power, legs of the robots were designed such that they could lock up in a stand-up position without consuming any power.

Designed By:

- ◆ Syed Zulfiqar Ali Zaidi 11ES46
- ◆ Tur Ali Sina Khan 11ES59
- ◆ Ali Akbar Shah 11ES20
- ◆ Zeeshan Samo 11ES138
- ◆ Sundar Lal Lohana 11ES51
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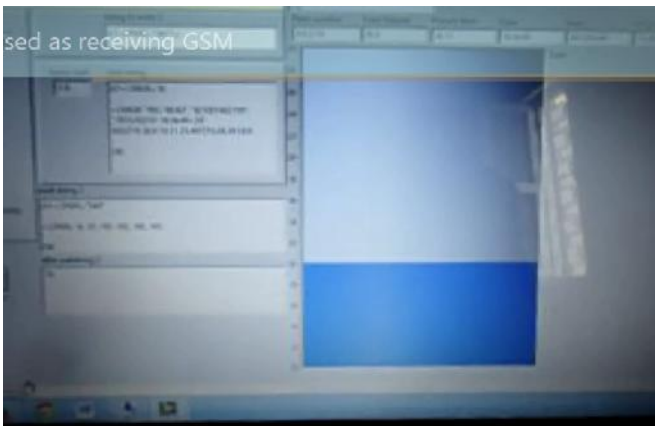
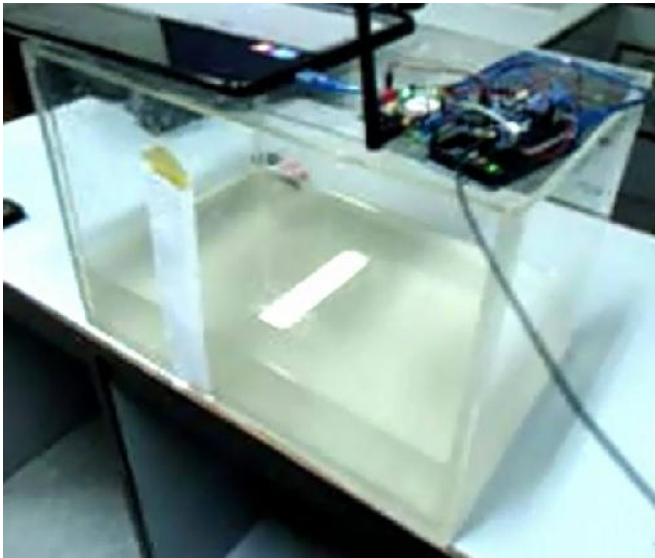
Automatic Fuel monitoring, Tracking and Theft detection System

Abstract:

This system presents the design, implementation and characterization of a hardware platform for Fuel Management System (FMS) for fuel carrying vehicles. The primary design goal is to devise a system capable of monitoring of the fuel level in real time. This system is proposed for fuel carrying road tankers which carry fuel from oil depots to end users e.g. petrol-stations. This system is based on hardware as well as software. The hardware part consists of fuel level circuits, on-board Arduino, GSM and GPS modules. While the software part consists of LabVIEW for Database purposes. This system offers an Automatic Electronic System (AES) which replaces manual monitoring of fuel. This system measures fuel volume and sends measured volume to the owner's mobile as well as owner's computer through GSM network. It also provides a technique for detecting theft or fraud incidents in case of fuel theft or fuel leakage. Besides this it has capability of tracking location of each fuel carrying tanker such that place of incidents can be localized. This system allows us to analyze and calculate fuel transportation in an automatic manner with a cheap system based on easily available electronic components.

Designed By:

- ◆ Arif Ali Brohi 11ES71
- ◆ Furqan Mazhar (A.G.L) 11ES88
- ◆ Komal Khuwaja 11ES89
- ◆ Salman Shaikh 11ES72
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Supervised By:

- ◆ Engr. Aamir Ali Patoli

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- ◆ Engr. Azam Rafique Memon
- ◆ Engr. Mansoor Ali Teevno

Induction And Solar System Electric Vehicle

Abstract:

At present time, one of the major concerns in the world is Energy Crises. Many other issues are also growing due to this devastating situation of Power and Fuel Shortage and their demand is increasing day by day. The shortage of petrol in Pakistan in December of last year and in January of 2015 is a unique example of today's fuel and energy crisis. Our project presents the concept of Wireless Power Transmission through inductive coupling and Solar Power System in Transportation without using Fuel. Wireless Power Transmission through inductive coupling reciprocated with Solar Power offers the far-term potential to solve major energy shortage issues while travelling.

This project entitled "INDUCTION AND SOLAR SYSTEM ELECTRIC VEHICLE" is based on two portions the first one is induction system and second is solar system. The induction part of this project works on the laws of electromagnetic induction. Actually step down transformer is connected with main power supply of 220V which steps down the voltage at 24V then this is power of 24V is connected with D.C power supply which converts 24V of A.C into 12V of D.C this supply is now connected with transmitter which converts again D.C 12V into A.C and then transmitter inductive copper cable is buried underground which transmit the electrical power via electromagnetic induction.

Then receiver side also called pickup equipment is fitted underneath the vehicle which receives through non-contact (wireless) magnetic induction which is used to power the vehicle directly or

charge the batteries. In this project the receiver receives A.C power of 33V at 1 inch distance through copper coils, as the distance increases the strength of voltage decreases. Receiver receives the A.C power then converts back into D.C voltage of 9V now motor of vehicle is connected with 12V of D.C to run the vehicle.

The solar part of this project works on sun light directly strike on solar panel which is fitted above the vehicle. The solar panel used in project generates 18V which is used to power the vehicle or charge the batteries.

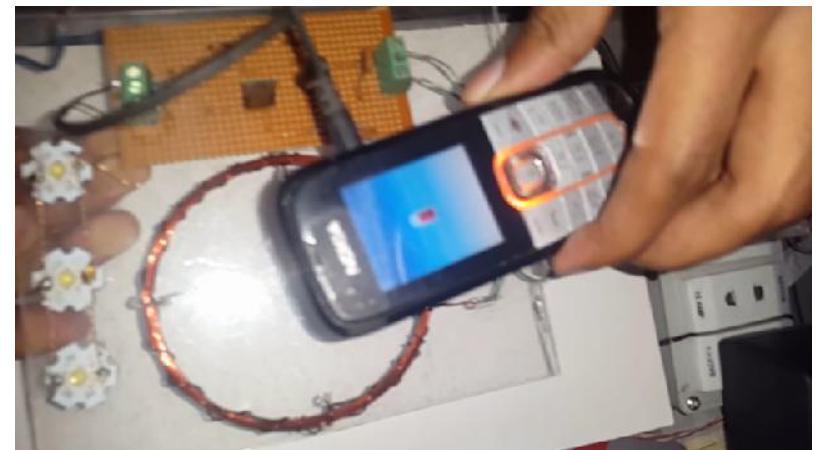
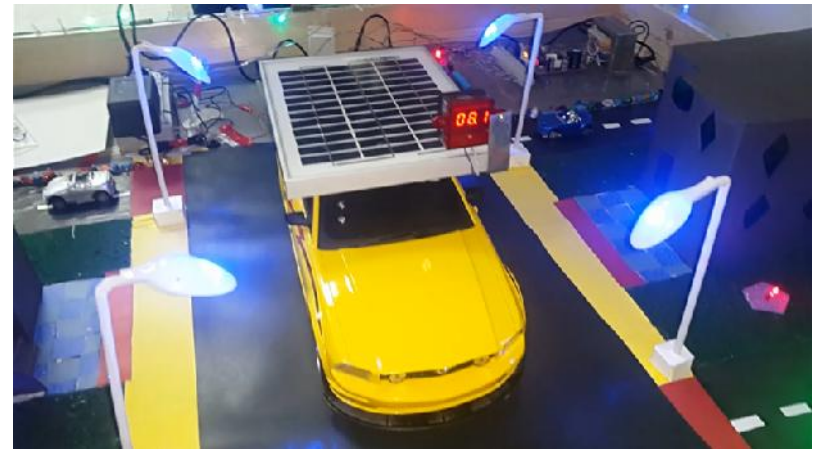
The switching mechanism is also used in vehicle to shift the power from induction to solar and vice versa automatically. Through this project we can build a real electric car which operates on induction and solar power and the vehicle runs without any fuel or gas.

We are the first among undergraduates of M.U.E.T as well as Pakistan who have designed such a system in which electrical power is transmitted wirelessly and that concept is used in electric vehicle with the addition of solar power. We measured all the values of voltage, current and frequency at each step in our project every data is mentioned in great detail in this project report.

Designed By:

- ◆ Arshad Ali Baloch 11ES100
- ◆ Kazim Hussain Wadho 11ES93
- ◆ Juma Boy Juma 11ES143
- ◆ Farooq Ahmed Bughti 11ES144
- ◆ Naeem Ahmed Magsi 11ES99
- ◆ Saddam Hussain Dogar 11ES111

Induction And Solar System Electric Vehicle





Supervised By:

◆ Prof. Dr. Wajiha Shah

Co-Supervised By:

◆ Engr. Zaigham Abbas Shah

Home Energy Management System

Abstract:

This thesis describes the HEMS (home energy management system) based on Wi-Fi communication. By using HEMS the user can remotely control their home appliances just by Android App. This project also features scheduled controlling of devices. We can turn ON and OFF the devices at specified time range. We have proposed the implementation of a less-costly, portable and easy to use equipment to save energy. It is simply considered as a portable system by using this, customers can control and schedule number of home appliances remotely, just by using Android App. There are so many researches already been done on HEMS but all are complex, expensive and can limitedly control the number of appliances but our HEMS is very cheap, easy to implement as well control any number of home appliances. The architecture of our HEMS is based on master node and slave node. The appliances are connected directly with slave node and slave node is controlled and scheduled by master node. The main advantage of HEMS is that main server can be moved to any other place without any trouble.

Designed By:

- ◆ Asma Channa (GL) 11ES24
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- ◆ Sumbal-Maham Qureshi 11ES65
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Supervised By:

- ◆ Engr. Aamir Ali Patoli

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- ◆ Engr. Zaigham Abbas Shah

Electromagnetic Disc Braking System
(An Application of Eddy Current that can be used in future braking system)

Abstract:

Electromagnetic braking system so as to have a future alternative to traditional breaking systems. Electromagnetic braking system slows an objects by creating an eddy current through electromagnetic induction which create resistance. In Eddy currents brakes, no precaution is taken in order to set the currents free to flow. The principle of electromagnetic braking involves the conversion of kinetic energy into thermal energy. When a non-magnetic or magnetic conductive material rotates into static magnetic field, eddy currents are induced in material. Paths of induced eddy currents depend on the geometrical configuration of moving conductive material and also its electromagnetic properties. However, due to electrical resistance of the conductive material, the eddy currents are disrupted into heat and braking torque occurs.

Our aim is to develop and construct an experimental project on electromagnetic disc braking system for rotating disc to analyze the magnetic braking and various parameters involves in electromagnetic braking system. There will be also simulation model used for analysis of magnetic braking in rotating object.

The mathematical analysis of electromagnetic brake is almost impossible, due to the complexity of the electromagnetic problem. Accordingly, finite element method can be used to analyses the electromagnetic brake of eddy current. The design procedure of an electromagnetic brake requires multidisciplinary approach in terms of mechanical, electrical and

thermal aspects.

The work focuses on design, development and experimental verification of an electromagnetic brake. The electromagnetic and thermal design is handled in both FEM and analytical models. Electromagnetic brake prototype is produced and design aspects are experimentally verified. The proper and suitable design of electromagnets are required to design EMB system. The electromagnets provides the required magnetic field that can be utilize in baking of disc. The magnetic field were also confirmed experimentally. The EMB design indicated that in order to achieve the required specifications and constraints, a large number of turns and core would be required. The disc is rotate using universal motor through belt pulley mechanism. The simulation model was tested using the permanent magnet to confirm the simulated angular speed, axial torque and total heat.

In order to confirm the flux travelling through the air gap, a ferromagnetic material was used to measure the magnetic flux distance. The results of experiments for the angular speed against time was collected using tachometer and then the graphical representation was draw in Microsoft excel and also in Matlab.

Designed By:

- ◆ Burhan Aslam 11ES104
- ◆ Erum Karim 11ES73
- ◆ Muddasir Akram 11ES112
- ◆ Sonia Qazi 11ES108
- ◆ Syed Wajahat Ali 11ES141

Electromagnetic Disc Braking System
(An Application of Eddy Current that can be used in future braking system)



Supervised By:

- ◆ Dr. Imtiaz Hussain Kalwar

Co-Supervised By:

- ◆ Dr. Arbab Nighat

Grid Based Target Tracking Of Armed Soldier Robot

Abstract:

Today there is a great need of antiterrorism as today's world is surrounded by various terrorisms. Many robots have been built for this purpose using different methodologies among which daisy chain is prominent in most of the cases. Phase adjusted by a coupled oscillator model has also been used to provide walking of humanoid robot. We are exploiting the application EV3 Mind storm to implement the grid based locomotion of robot in a guided way in terms of input coordinates to provide one way to feasibly realize an armed soldier robot.

The resulting model is tested for each coordinate in which our robot is required to make decision on basis of signs of abscissa i.e. x coordinate and ordinate i.e. y coordinate to go along required course of axes to reach the specific location prescribed by input coordinates. Our robot on reaching the destination location search the target, locate its gun and fire until it completes its task. After this our robot will move back along the axes to reach its source location.

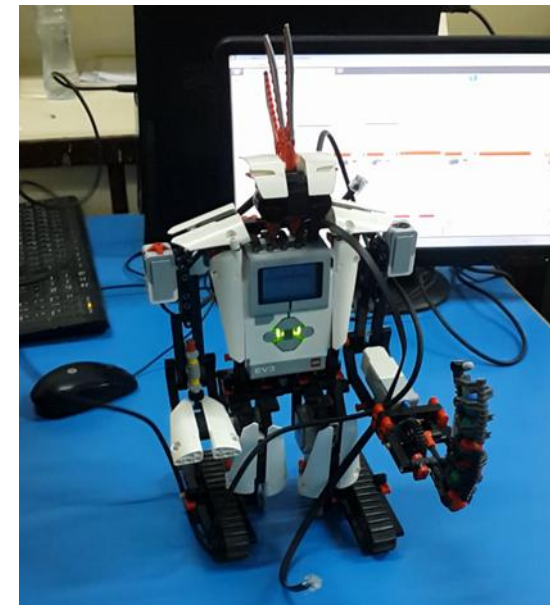
Testing and calibration depends upon center of gravity of robot. Depending upon the load of the end effector & the manipulator, the center of gravity changes. Thus this needs calibration, provided that load of end effector is constant, the calibration will work satisfactorily.

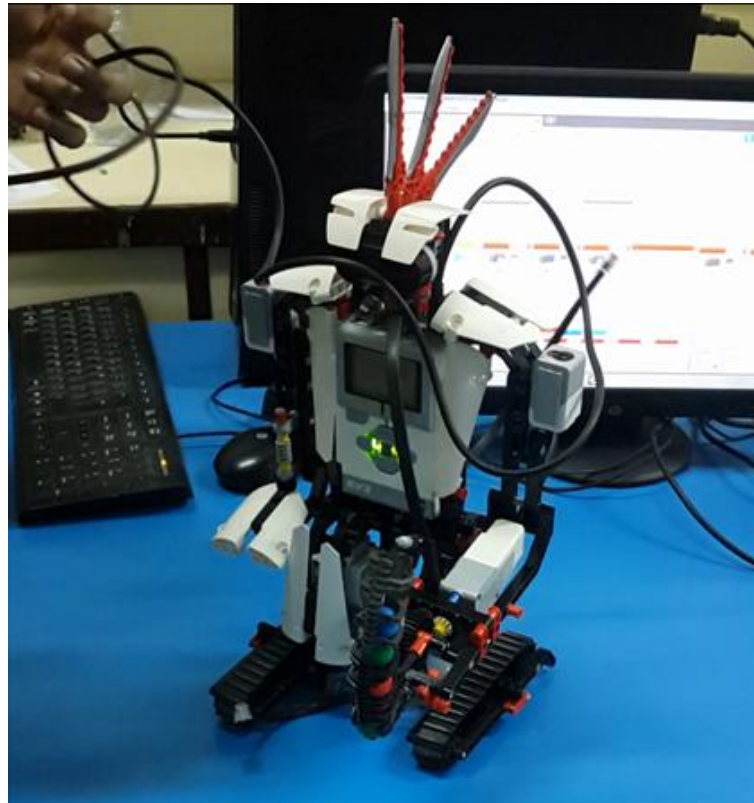
Grid Based Target Tracking Of Armed Soldier Robot

This work can be extended further by visual realization so that autonomous implementation of input coordinates can be done to provide localization of targets. Also by using sophisticated sensors the robot decision making tendency can be further enhanced to differentiate between the target, civilian, and, army forces.

Designed By:

- | | |
|--------------------------|--------|
| ◆ Muhammad Fawad | 11ES03 |
| ◆ Junaid | 11ES16 |
| ◆ Mian Sarmad Saeed Shah | 11ES53 |
| ◆ Maliha Siddiqah | 11ES55 |





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◆ Dr. Imtiaz Hussain Kalwar

Co-Supervised By:

◆ Dr. Tayyab Din Memon

Smartphone Controlled Unmanned Aerial Vehicle (UAV)

Abstract:

Unmanned aerial vehicles (UAVs) are the attention of researchers around the world, due to their performance in both indoor and outdoor environments. Motivation to make Smartphone Controlled Unmanned Aerial Vehicle is taken from the smartphone technology, as the smartphone technology is growing rapidly. Smartphones can be used for many new and advance applications.

This project is to construct a Smartphone Controlled Unmanned Aerial Vehicle that would be able to maintain stability in an open-air environment. This research focused on development of a remotely operated Quadcopter system. The Quadcopter is controlled through a graphical user interface (GUI) on android Smartphone. Communication between GUI and Quadcopter is done by using wireless communication system. In this project, ESC's, props, ARDUPILOT, brushless motors and LIPO battery is used to make the basic structure of Quadcopter. The Quadcopter balancing condition is sensed and controlled by ARDUPILOT APM 2.5 flight controller, this flight controller has built-in compass and IMU. To achieve the communication between UAV (Quadcopter) Hobby King 4 Channel Wi-Fi receiver is used. Maximum operated time of Quadcopter is six minutes using 1500mAh LIPO battery and operate time can be increase by using large capacity battery.

Designed By:

- ◆ Ghayoor Hussain 11ES109
- ◆ Farhan Ahmed Shaikh 11ES87
- ◆ A. Hafeez Abro 11ES113
- ◆ Tanveer Almani 11ES83
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- ◆ Nasir K.K 11-10ES12



Supervised By:

- ◆ Dr. Tayyab Din Memon

Co-Supervised By:

- ◆ Engr. Shoaib Hassan Khaskheli

Robot Arm Using Arduino

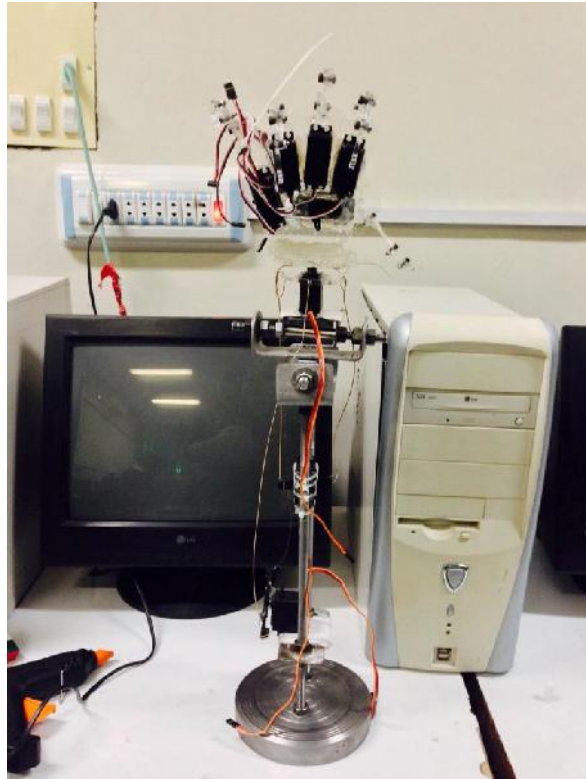
Abstract:

In today's world, there is an increasing need to create artificial arms in different situations where human interaction is difficult or impossible. They may involve taking readings from an active volcano to diffusing a bomb. Here we propose to build a robotic arm controlled by natural human arm movements whose data is acquired through the use of accelerometers. A gloved sensor filled with sensors is attached to a robotic arm through a micro controller and glove which has sensors attached to it will provide input to the robotic arm. The sensors change their readings and send them to the Arduino board which, according to its program, changes the rotation of the Arduino motors. For proper control mechanism and to reduce the amount of noise coming in from the sensors, proper averaging an algorithm is used for smoothing the output of the accelerometer. The development of this arm is based on ATmega2560 platform along with a personal computer for signal processing, which will be interfaced with each other using serial communication. Finally, this prototype of the arm may be expected to overcome the problem such as placing or picking hazardous objects or non-hazardous objects that are far away from the user.

Designed By:

- ◆ Talha Qadeer 11ES 01
- ◆ Agha Haider Ali 11ES 17
- ◆ Anum Samoon 11ES 27
- ◆ Rabbia Rashdi 11ES 35

- ◆ Ahmed Ali 11ES 39
- ◆ Abdul Basit Surahio 11ES 45



Supervised By:

- ◆ Prof. Dr. B.S.Chowdhry

Co-Supervised By:

- ◆ Engr. Zaigham Abbas Shah

Chat Server and Data Transmission Using Power Line Communication

Abstract:

The aim of this Project is to make a “Chat Server and File Sharing Network” using electric power lines, commonly referred to as Power Line Communication (PLC). PLC is a technology that utilizes existing electrical distribution lines, whether in-building or out in the utility’s distribution system, for delivering high-speed communications services.

Power line communications (PLC) refers to the concept of transmitting information using the electrical power distribution network as a communication channel. This technology allows a flow of information through the same cabling that supplies electrical power. This novel idea of communication helps in bridging the gap existing between the electrical and communication network. It is set to turn the largest existing electric network in the world, the electricity distribution grid stations, into a communication network.

This work presents an attempt of data transmission over power lines (DFOPL) techniques for building a “Chat server and File sharing network”, with the help of which the online users will be able to send and receive data (characters) as well as files with one another. For doing so, we are making use of a High Speed Power line Communication Module which is a transceiver and takes the responsibility of superimposing the transmitted data over the power lines and also extracting the data from the power lines at the receiving end. We have developed a

complete system that allows using PLC to send and accept files to the other users as well as send and receive messages.

Designed By:

- ◆ Suraj Veer (G.L) 11ES37
- ◆ Rakesh Kumar (A.G.L) 11ES25
- ◆ Mushtaque Ahmed 11ES54
- ◆ Shahbaz Bhutto 11ES38
- ◆ Asif Ali Laghari 11ES63
- ◆ Zaheer Yousuf 11ES23



Supervised By:

- ◆ Engr. Zaigham Abbas Shah

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- ◆ Engr. Azam Rafique Memon

GSM Based Advanced Notice Board Display

Abstract:

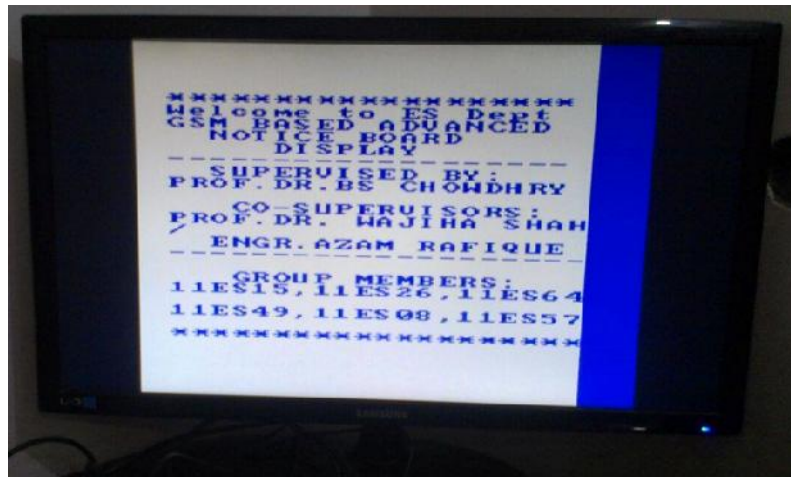
As we look around the globe we see the technology in everything .Day by day things are digitalizing. Specifically there is great trend of mobile phones; most of the people whether rich or poor are using them. This busy and fast moving world has deep need to be updated of the important stuff before the eleventh hour because they cannot take the risk of being uninformed hence introducing a sophisticated GSM based notice board so that to make an easy way for a person to inform others no issue in what part of world he is sitting and getting rid of manual old noticeboards which I guess are not that quickly informative plus wastage of papers as well. Such displays will be useful at places like where notice boards are still a necessary thing like hospitals, schools, universities, industries and different institutes etc. like police man can easily update the snap of a criminal through this system. So along with the informer, those who are informed will also be at ease if they subscribe they will get notifications at their own mobile when the informer (does not matter where the informer is in the world but he/she and the receiver system both should be under network coverage) .will send alert as an SMS on the number which is in GSM modem also it will be displayed to the VGA .

Hence a digital notice board displaying all the necessary stuff like time table , attendance, miscellaneous , results, alerts,etc are displayed one by one along with it new update arrives from

the authenticated person to GSM which is then displayed and sent ahead to all subscribers.

Designed By:

- ◆ Sonia Shah 11ES-15
- ◆ Qurat-UI-Ain Pathan 11ES-26
- ◆ Yasir Qureshi 11ES-64
- ◆ Saima Jatoi 11ES-49
- ◆ Memona Memon 11ES-08
- ◆ Junaid Qureshi 11ES-57



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- ◆ Prof. Dr. B.S.Chowdhry

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- ◆ Prof. Dr. Wajha Shah
- ◆ Engr. Azam Rafique Memon

IOT: Smart Animal Farm

Abstract:

Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized for various interesting purposes.

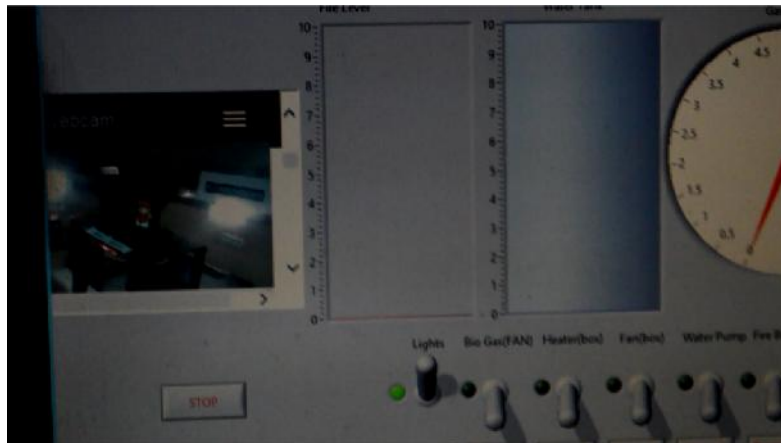
Healthy animals are very essential for our everyday lives and are important for global public health. Since the world population has been increasing day by day, so the demand for safe and very high quality animal proteins such as milk, eggs, meat and fish. Essential to this are good and sustainable farming practice, as well as we require such as systems that treat sick animal and control diseases.

Since everyone avoids from such unwanted job like farming and taking care of the animals. A sophisticated system capable of continuously assessing the health of individual animals, aggregating the data, and reporting the results to owners and regional authorities could provide tremendous benefit to the livestock industry. Such a system would not only improve individual animal health, but it would help to identify and prevent widespread disease, whether it originated from natural causes or from biological.

Animals play a very essential role in human life it is very necessary to protect the animals. Our purpose is known about the animal health, their body temperature, to exhaust the bio-gas when in excess, to detect the fire if any, to provide them proper diet, water. "When we are talking about the internet of things, it means we are making the world smarter".

Designed By:

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- ◆ Bilal Aziz 11ES140
- ◆ Daniyal Siddiqui 11ES142
- ◆ Hassnain Raziq 11ES119
- ◆ Aqsa Badar 11ES78
- ◆ Saadia Kulsoom 11ES127



Supervised By:

- ◆ Dr. Wanod Kumar

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- ◆ Engr. Zaigham Abbas Shah

Prosthetic Limb Movement Using Muscle Sensor

Abstract:

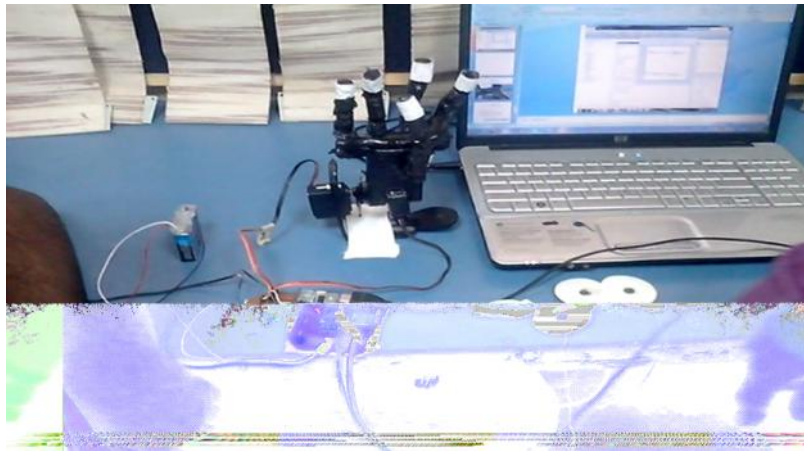
The rehabilitation for the handicapped is a big social issue in the world. There were many studies about assistive devices for the handicapped. Especially, the prosthetic hands were representative assistive devices for the amputees.

Prosthetic limb is an artificial device that replaces a missing body part. Prosthetic limb movement using muscle sensor is our final year project that helps the amputee people to have artificial hand. This hand uses muscle sensors to sense the desired movement of muscles and hence convert that signal into a meaningful form & hence let the artificial hand move.

The previous prosthetic limbs for amputee are externally powered and bulky. The main objective of our project is to customize the robotic hand by using muscle sensors instead of bulky circuitry and it is self powered.

Designed By:

- ◆ Mansoor Ali Laghari 11ES81
- ◆ FaiQa Faheem Barakzai 11ES118
- ◆ Muhammad Khan Chachar 11ES95
- ◆ Muhammad Naqash 11ES80
- ◆ Maheen Nawab 11ES79



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◆ Engr. Tufail Ahmed Waseer

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◆ Engr. Shoaib Hassan Khaskheli

Tricopter With G.P.S System And Bluetooth Telemetry

Abstract:

Weather stations are very common in every institute and administrative building but a weather station has never been portable . So we set forth to create a portable weather station with the advent of android everything is turning portable even appliances like air conditioner are android controlled. We have created an infrastructure that is truly portable in sense of hardware and software. The hardware created is around Arduino and is based on a self-designed Arduino shield. The Arduino shield is composed of voltage regulating circuitry and sensor mounting traces and headers which accommodate the sensors on Arduino. The sensors used are of different variety of interfaces from Analog to Digital to I2C and SPI interfaces. The sensor data is displayed on the LCD attached with the sensors. This Arduino + Shield Setup is connected to a WIFI router which is modified using a custom firmware and runs a serial to network proxy. The data from the controller is transferred via serial USART to the wifi router which then converts it into TCP/ IP protocol compatible data , ready to be received by your android phone. Our portable Weather station includes sensors for measure Atmospheric Pressure , Humidity, Temperature and Air Flow.

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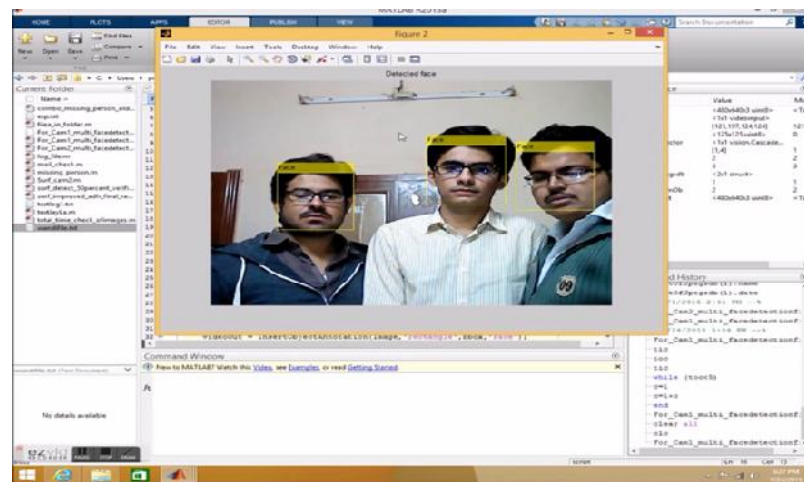
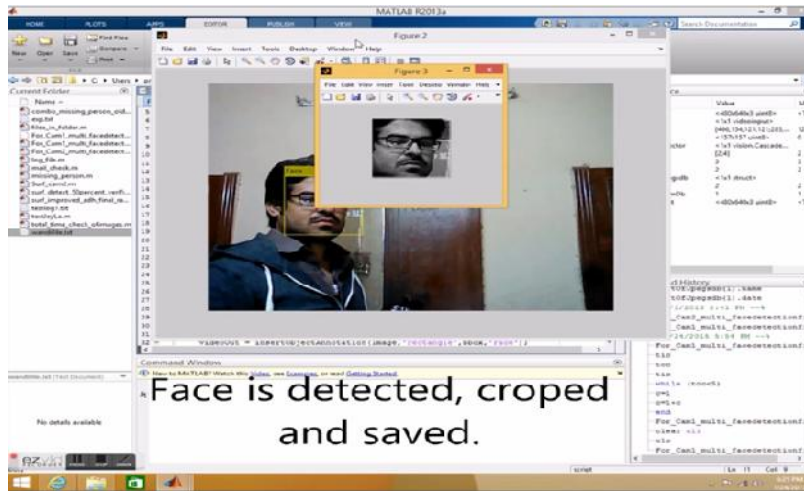
Smart Surveillance System

Abstract:

In past, it was difficult to determine and track the location of the people, so to provide easiness to the monitoring bodies, there is dire need of an implementation of a smart system which gives information to the authorities about the location of the people. Surveillance system should have characteristics of working autonomously, therefore a smart surveillance system that is software embedded system which uses MATLAB software for programming is developed. The system can perform real-time processing of the video data from client cameras, and employs intelligent video analysis algorithms, provides users quick, accurate and intelligent video analysis service. This system also generates text file also called as log maintenance file which stores location, time and data of the tracked person. The system has also its own broad database that contains images of peoples detected at client side which is generated at central server. This smart system has also capability of alerting monitoring bodies through an email or text message.

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RFID Based Librarian Robot

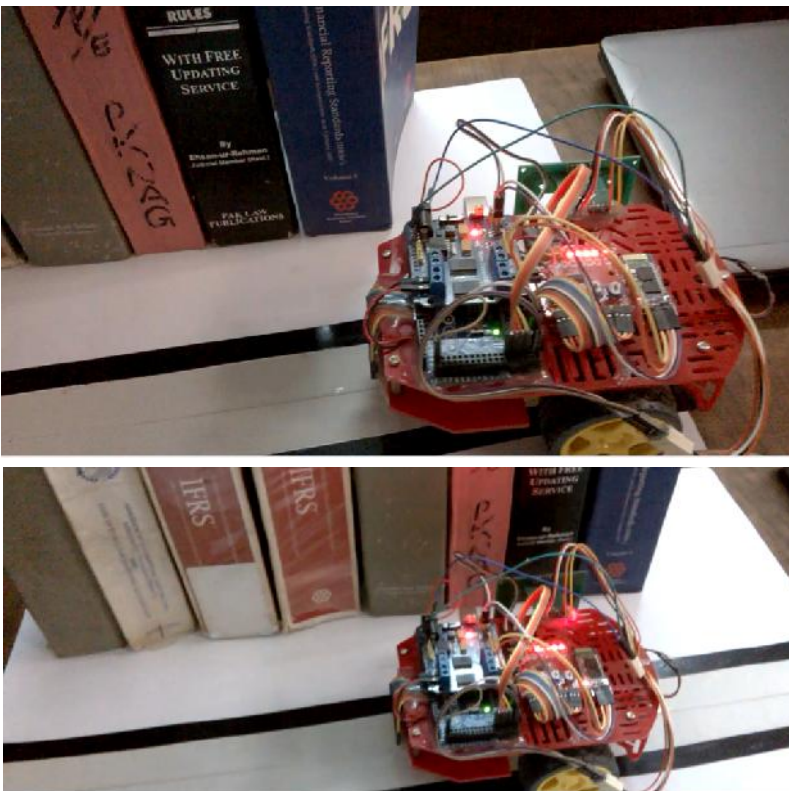
Abstract:

RFID is one of the most technologies being adopted by both industry and academic world. Modern academic library is a place where millions of books advanced; periodicals, CDs, DVDs and other electronic reading materials are contained. It is a challenge to manage for librarians, managing such type of huge collection. So RFID based Librarian Robot can be used to solve management problems. RFID means Radio frequency identification i.e. the technology that uses radio waves to automatically identify books. The objective of any RFID system is to carry data in suitable transponders, generally known as tags and to retrieve data, by machine readable means, at a suitable time and place and to satisfy needs. The use of RFID also reduces the amount of time required to perform Circulation operations. The most significant time saving with bootable to the fact that information can be read from RFID tags much faster than form barcodes and that served items in the stack can be read at the same time. The most fundamental component in the RFID system is the tag. Although the majority of individuals use this to determine whether an RFID system is being employed, it is often one of the most difficult pieces of equipment to identify physically. Passive RFID tags provide the simple function of uniquely identifying an object—whether it is a tool, vehicle, person, or object. Each RFID tag has a unique code that is read by the readers. So in library each book is attached with a RFID tag, in order to find the required book. RFID based Librarian Robot follows the particular path and searches for the requested

book. As it reaches to the required book gives indication.

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Fire Fighting Robot

Abstract:

Firefighting is one of the risky, high responsible and life savior tasks in which human firefighters need to cope with hazardous situations in order to save and protect both human life and property by making entrance to such burning buildings and extinguishing fire using equipment such as fire extinguisher, axes and cutting equipment. This firefighting process has some disadvantages. Human firefighters have to still come to near fire scene after building, house, areas, industries have been targeted by fire leading to risk of suffer losses such as injuries to human or materialistic damage etc. to some extent.

Technology has nowadays greatly improved which bridged the gap human firefighters and machines allowing for more immediate, efficient and effective method of firefighting. A firefighting robot must be able to reach and then extinguish fire quickly and safely, preventing further damage and reduce fatalities.

This thesis work includes design and implementation of firefighting robot, an electro-mechanical arrangement which is supposed to function in the same way as human firefighters do: extinguishing burning places to protect human life and property as well. The application of firefighting robot avoid direct contact of firefighters to fire hazards, hence greatly reducing the risk of suffering damage. This intelligent robot is itself proven to be good alternative for human firefighters.

This intelligent multipurpose firefighting robot is generally a wirelessly controlled three-wheel vehicle attached with different actuators and electrical circuits, allowing it feature of mobility through buildings, narrow openings or places, overcoming extremely high temperature. This vehicle is controlled by remotely located base stations or buildings' security control departments, where human operator, upon receiving fire alarm, controls and gives commands to move and reach the fire incident and makes robot pump out water in order to put off fire.

As aforementioned, the firefighting robot must be able to go rough and difficult places and reach fire, then robot is supposed to transmit live video stream through setting up an automatically

wireless communication between the Robot and Base Station.

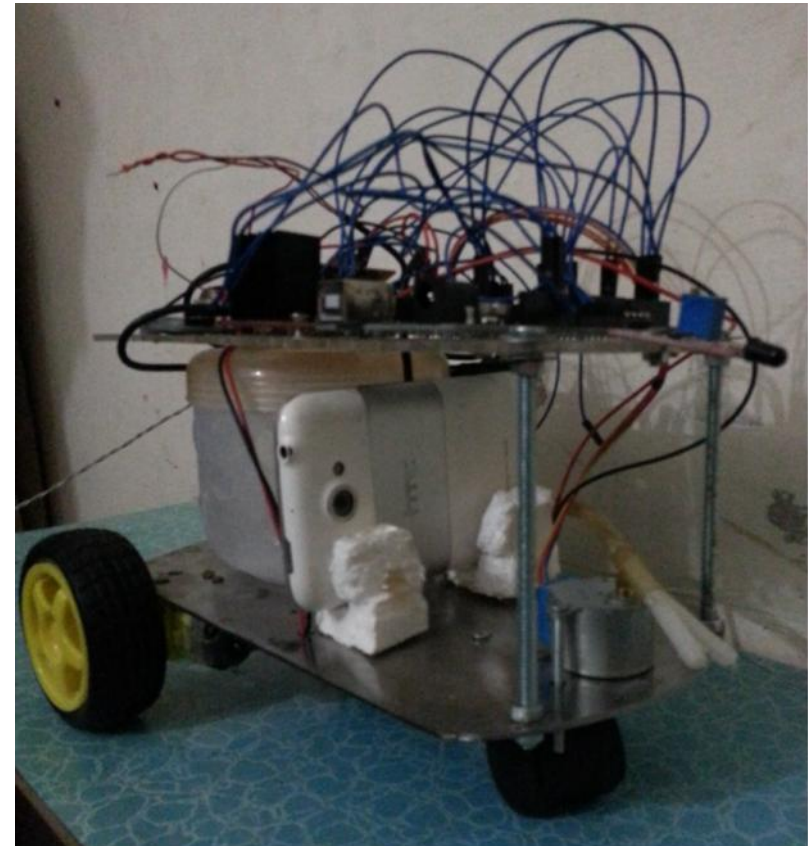
The construction of firefighting robot is made with highly efficient temperature tolerable material as body structure so as to sustain with high temperature of flame and not to get damaged itself. The main processing element, a Microcontroller Board used is Arduino Mega 2560 with corresponding firmware loaded into it, giving computational power to firefighting robot for purpose of communicating with devices and base stations, receiving commands or send self-robot status and carry out tasks accordingly. The entire robot is constructed upon a three-wheel chassis and is driven by 12V DC supply, giving electrical energy to Arduino and all circuits associated with it, motor drives and actuators. The communication link between robot and base station is implemented using Bluetooth Technology, for that purpose, a Bluetooth module is connected with Arduino. In order to obtain live video stream of firefighting robot, an Android smartphone's camera serving as IP camera is used with an Android application named IP Webcam installed into it for purpose of establishing network connection automatically. The robot movement is usually done by two rear wheels which are controlled by Dual H-Bridge Motor Drive module L298N. The major role in fire extinguishing is played by Stepper Motor and Water Pumps, which are used to actuate process of water spraying over fire and these all actions are controlled by Arduino.

This thesis work describe the design and implementation of such a robot, including components functioning mechanism and logic required to accomplish the task of reaching fire places and extinguishing it successfully and safely in order to ensure the performance as perfect fire extinguisher to save humans and other valuable properties.

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Fire Fighting Robot



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Design And Implementation of EOG Data Acquisition System

Abstract:

Electrooculography (EOG) is a technique for measuring the resting potential of retina. The electrooculogram (EOG) signal is derived from the polarization potential, also known as the Corneal-Retinal Potential (CRP), generated within the eyeball by the metabolically active retinal epithelium. The CRP is produced by means of hyper-polarizations and de-polarizations of the nervous cells in the retina. The electrooculogram (EOG) signal is acquired by a bio-channel signal acquisition system and prominent artifacts and interface is suppressed. The three plane electrodes which contain the information related to the eye blinking and vertical (or horizontal) eye movements referred to pre-designed command table are employed to detect EOG signals which then processed for use in biomedical instrumentation systems such as eye movement and blink detection and eyeball tracking. The increased performance of personal computers and their reduced cost has made it possible for development of PC based signal processing systems. Hospitals need several measurement systems that can measure physiological parameters of the patients. Bio based human computer interface (HCI) system which based on the electrooculogram (EOG) is proposed in this research. It transforms electrical potentials recorded by horizontal and vertical EOG into a computer in order to control external equipment. Based on this HCI system, the remote control equipment driven by EOG is realised. The system consists of EOG acquisition unit, EOG pattern recognition part and control command output unit.. Further it includes the application of EOG stage hospital alarm system. EOG bio-control is found to be a suitable alternative for control schemes especially for quadriplegics and severely paralysed patients.

Design And Implementation of EOG Data Acquisition System

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Parameter Estimation Of DC Motor

Abstract:

DC motors are known to have very vast applications in modern industries. Since these machines have become an indispensable part of electrical/hybrid systems it is therefore necessary to obtain an accurate model of DC motors. An essential step towards automation is therefore an efficient means of computer control of DC motor so that they can be handled with greater efficiency. Moreover, there is a need to work with very precise model of DC motor for the purpose of optimization and design of analytical control systems. For this reasons the values required for establishing reference of motor parameters provided in the motor specifications often do not suffice since DC motors often suffer from greater tolerances in their mechanical and electrical parameters. Therefore, without using high-priced testing equipments and prolonged testing cycles, a rapid and efficacious approach for parameter estimation based on the motor input and output is essential and helpful, specifically for the field applications and fast prototyping of controller. This project focuses on parameter estimation of armature controlled DC motor using MATLAB as controlling software and DC Modular Servo System MS-150 as hardware. Arduino UNO has been used to develop an interface between hardware and software. The speed of the motor has been taken as a directly measured variable taken in the form of feedback voltage however the parameters to be estimated include Inertia (J), Damping (b), Back emf Constant (K), Armature Resistance (R), Armature Inductance (L). The parameter estimation toolbox provided in simulink has been used for the purpose of estimation. The results obtained using pre stored values are validated against measured data.

Parameter Estimation Of DC Motor

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Dynamic Control Surveillance Of Railway Track

Abstract:

Trains are widely used worldwide in order to travel from one place to another and the use of trains is getting increased day by day due to the increase in fairs of aircrafts, people all over Pakistan use train to travel from one place to another but unfortunately there is no security in our trains of the passengers as well as the trains. In this research we have a made a model to represent a security system which with some enhancements can be implemented in real time trains. We have automated the system using motors which are automated with the help of micro-controllers, RF sensors which are used for communication between Robot and user. Robot will detect the derail and damaged track which are dangerous for train drive. This project can be implemented with some changes in real trains and it will ensure the safety of passengers as well as the government property which are trains and tracks.

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Department of Electronic Engineering



Electronic Engineering is an increasingly important engineering discipline that significantly affects the other disciplines of engineering. It is in great demand in both developed and developing nations. Continual advances in electronic engineering in the areas of materials, processes, devices, and circuits have been leading to rapid advances, in the existing applications of engineering as well as in the emergence of new applications. To harness the full potential of electronic engineering developments and further advance the state of electronic technology, it is important to have strong programs to educate and train individuals in this key discipline of engineering.

Electronic Engineering artifacts play major role in the evolution of mankind and culture. Today, the Electronic Engineering profession and the education of engineers are challenged by the rapidly changing nature of those engineering systems which determine what is meant by 'modern technology'. The advent of Microprocessor Technology has probably made Electronic Engineering the exemplary technology of this century, along with emergence of new species, with higher levels of integration. The existing and potential uses and applications of Electronics are multitudinous. Indeed it is difficult to point to any industrial or commercial area which may not eventually be affected by this technology.

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