Department of Electronics and Communication Engineering

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TECHCOM

TECHNICAL MAGAZINE

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NARAYANA ENGINEERING COLLEGE :: GUDUR

(Aproved by AICTE & Permanently Affiliated to JNTU,
Ananthapuramu, An ISO 9001:2015 Certified Institution)

Vision of the Institute

To be one among the premier institutions of the country for professional Education in producing technocrats with Competent skills, Innovative ideas and Ethics strong to serve the nation.

Mission of the Institute

- To provide an environment most conducive to learning with state of the art infrastructure, well equipped Laboratories and research facilities to impart high quality technical education.
- To emphasize on innovative ideas and creative thinking and prepare them to meet the growing challenges of the industry.
- To inculcate the leadership qualities, multi-disciplinary approach, ethics and lifelong learning in graduates to serve the diverse societal needs of our nation.

Vision of the Department

To produce technically competent Electronics & Communication Engineers with a motive to meet the needs of the industry and evolving society through advanced research, professional ethics and lifelong learning.

Mission of the Department

- To enrich the technical skills of the students through effective teaching-learning practices, continuous assessment methods and eminent faculty.
- To continuously enhance creative thinking, research ability and innovative skills of students through training on core and multidisciplinary technologies and skill enhancement programs.
- To inculcate leadership qualities, ethics, social responsibility and gratitude through outreach programs.

Program Educational Objectives (PEOs)

PEO-1: Attain the global and local opportunities and reach greater heights in their chosen profession by demonstrating technical expertise.

PEO-2: Gain recognition by exhibiting problem solving expertise for addressing significant problems of industry and society.

PEO-3: Become good leaders with ethics and support, contribute and encourage diversity and inclusiveness in their workplace and society.

Program Outcomes (POs)

PO-1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO-4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO-5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO-6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO-7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

PO-12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

PSO-1: Responsive to ideas: Apply the knowledge on core Electronics and Communication Engineering in order to develop skills to analyze, design and develop innovative solutions for the real world problems.

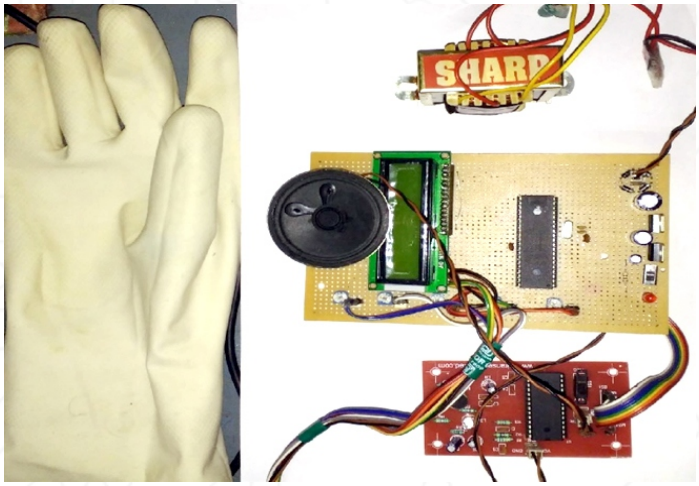
PSO-2: Domain Expertise: To develop interpersonal skills to demonstrate proficiency using the latest hardware and software solutions by maintaining professional and societal responsibilities.

Professor Desk

The Magazine "Tech Com" team works to bring out the annual official student-publication of department of Information Technology. Each year, our team works extensively to bring out the technical report writing skills of the students. The final publication reflects and encompasses the creative technical presentation skills inherent to the academic and upcoming areas in the field of computer science and information Technology. The magazine's primary focus has been geared at covering articles reflecting the student's knowledge and associations with latest and leading edge-technologies.

The magazine continues to expand its reach to achieve its vision of being a truly representative student publication. I am thankful to all the staff and students of IT department for their contributions in making of "Voices Of IT" and I hope to build on this ethos just as much during the upcoming academic years.

SPEAKING MICROCONTROLLER FOR DEAF AND DUMB PEOPLE



Micro controller based speaking system for deaf and dumb is designed to give the signs, which are preloaded in the device.

It is a micro controller based device, which gives the alert sounds just by pressing the control buttons, which are given some redefined messages like asking for water, washroom etc., here the person can just press the control button which indicates the sign of water (example) then the device sounds the same with some output volume. Micro controller is the heart of the device. It stores the data of the needs of the person. So that it can make use of the data stored whenever the person uses the device. This device helps the deaf and dumb people to announce their requirements. By this the person who is near can understand their need and help them. This saves the time to understand each other and ease in communication deployment, developer tools for the internet of things, and many more.

This saves the time to understand each other and ease in communication his device is designed to provide with a greater advantage producing voice-based announcement for the user i.e. the user gets the voice which pronounces his need as and when it is required.

Proposed system is used for deaf and dumb people, in system voice module, keyboard 1x4, Arduino controller and display 16x2 are interfaced with arduino board. In this system the keyboard 1x4 is used for giving input by deaf and dumb people. Four keys are used for displaying different messages with sounds. The voice module ISD 1820 speaks the different messages according to the keys which are pressed. In this module we store the 20 seconds time of message. The same message will be displayed on the display 16x2.This system helps for communication between deaf and dumb people and well people. For this system we not need to learn the sign language. Thus, it reduces the misunderstanding between the dumb peoples. A micro-controller Atmega 328 8 bit controller is used for reading the inputs from the deaf and dumb people and gives respective message on display with sounds. Arduino uno board requires the 5V DC voltage, this voltage is generated from the 230 V 50Hz AC voltage by using the Linear power supply.

CHEMARTHI JYOSHNA
16F11A0413

SMART HELMET FOR SAFE DRIVING

A smart helmet is a type of protective headgear used by the rider which makes bike driving safer than before. The main purpose of this helmet is to provide safety for the rider. This can be implemented by using advanced features like alcohol detection,

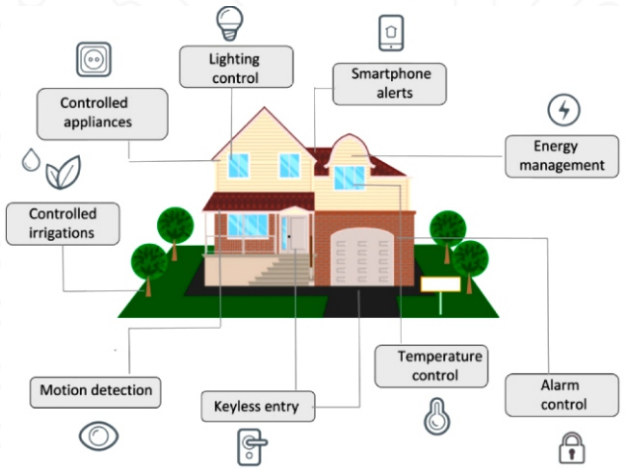
accident identification, location tracking, use as a hands free device, fall detection. This makes it not only a smart helmet but also a feature of a smart bike. It is compulsory to wear the helmet, without which the ignition switch cannot turn ON. An RF Module can be used as wireless link for communication between transmitter and receiver. If the rider is drunk the ignition gets automatically locked, and sends a message to the registered number with his current location. In case of an accident it will send a message through GSM along with location with the help of GPS module. The distinctive utility of project is fall detection; if the rider falls down from the bike it sends a message.

Every single person riding a two wheeler is required to wear protective headgear following the standards of BIS (Bureau of Indian Standards). Also drunken driving under the influence (DUI) is a criminal offence according to the Motor Vehicle act 1939, which states that the bike rider will get punishment. Currently bike riders easily escape from the law . These are the three main issues which motivates us for developing this project. The first step is to identify whether the helmet is worn or not. If helmet is worn then ignition will start otherwise it remains off. For this, Force Sensing Sensor (FSR) sensor is used. The second step is alcohol detection. Alcohol sensor is used as breath analyser which detects the presence of alcohol in rider's breath and if it exceeds permissible limit ignition cannot start. It will send message to the number saying that "Rider is drunk and is trying to ride the bike". MQ-3 sensor is used for this purpose. When these two conditions are satisfied then only ignition starts. The third main issue is accident and late medical help. If the rider has met with an accident, he may not receive medical help instantly, which is one of the main reasons for death.

Every second people dies due to delay in medical help, or in the case where the place of accident is unmanned. In fall detection, we place accelerometer in the bike unit. By this mechanism accidents can be detected. The aim of this project is to make à protection system in a helmet for the safety of bike rider. The smart helmet that is made is fitted with different sensors responsible for detection. There are two main units in this project. Each unit uses a microcontroller. Signal transmission between the helmet unit and bike unit is done using a RF module.

BUKKARAJU SAI KIRAN
17F11A0407

IOT BASED INDOOR LOCATION DETECTION SYSTEM FOR SMART HOME ENVIRONMENT



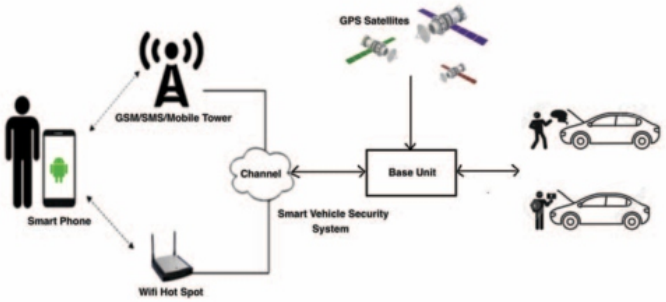
Smart home environment is expected to meet the requirements, essentially for the aging population, to support the concept of" aging in place", to provide reliable care and to ensure safety and proper diagnosis by keeping track of daily living, medical condition of the resident and providing feedback to the caregiver. In order to meet these requirements, smart home of today should support a number of functionalities. One such functionality of a smart home environment is the location detection. In this article, propose a voice-based location detection system which can be integrated in a smart home environment. Our location detection system uses Amazon Echo as the voice interface and HC-SR04 ultrasonic sensor to detect location of specific patients. The proposed location detection will be suitable for large scale application where we may need to keep track of multiple patients. Moreover, the inclusion of voice enabled feature to this system will reduce the burden of learning curve of new technologies on family and caregivers thereby improving the quality of life. With the advent of various IoT protocols like the Bluetooth, WiFi etc. connectivity among various devices have increased making systems more autonomous and integrated.

IoT has found its application in various domains like smart home, wearables, smart city which includes smart surveillance, automated transportation etc. IoT is indeed a key factor for economic growth and improving the quality of life of people. One such application of IoT: the smart home, is gaining popularity owing to the ongoing crisis of the aging population. People aged 65 and above is considered as the fastest growing population in present day world especially in the Americas, Europe and Asia. US Census Bureau has reported that the number of people over the age of 60 is expected to reach 1.2 billion by 2025. However, on the flip side, aging population are prone to be a victim of chronic illness and as result increasing aging population are a burden for caregivers and families because of limited infrastructure available to meet the health needs of the fast-growing aging population. Smart home is a potential solution that can meet the requirements of the aging population. Smart home features are capable for providing extensive health care and monitoring continuously and even much faster, reliable observation and results than human effort. Also, smart homes can reduce the burden on health care providers and also support the concept of" aging in place". Various works have been done in the area of smart home to increase their functionality and to increase automation with a view to providing comprehensive health care and improve the quality of life. With smart home capabilities, residents of a house can control the light, fan, T.V and other appliances remotely or from a single device. With smart security surveillance system, security features of home is enhanced providing assurance of the safety of the resident to the caregiver and their families. Smart health monitoring system in the form of Personal Digital Assistant, smart bathrooms are capable of monitoring the health of the individual and send updates to the caregiver. Indoor location detection has gained much attention and much work has been done in the past decade which has focused on location-sensing technologies, location-aware application support, and location-based applications. Monitoring the location of an individual is important because this allows us to detect any abnormal behaviour of the resident. Location detection also provides vital information about the pattern of living of the resident, their health and also their feelings. This information will help the caregiver to render better and intelligent services thereby providing better and safe living experience.

In this article we propose a voice based indoor location detection system that can identify the location of a specific person which is important for large scale implementation like in hospitals etc. where location detection plays an important role.

ANNAM SANDHYA RANI
18F11A0404

IOT BASED SMART VEHICLE MONITORING SYSTEM



Transportation system has been a part of evolving of humans. One cannot image the life without vehicles. To accommodate the vast number of populations, the number of vehicles also has been increased rapidly. This also led to increased number of accidents. The accident-avoidance measures used now a day are all static and old. Also, there is no proper accident detection mechanism. This study proposes Smart Vehicle Monitoring System (SVMS) for early detection of accidents and also to prevent thefts. SVMS uses IoT technology to monitor the vehicle continuously and also to access and control remotely. The IoT devices placed in vehicles is designed using Raspberry Pi (RPi) that is acquainted with sensors to detect accidents immediately. The RPi is also acquainted with a camera to find the severity of accident. To detect the severity, SVMS uses machine learning based image classification model. When the accidents happen the SVMS detects it immediately and finds the severity of the accident. Then the system will immediately inform that to the authorities. The SVMS also acquainted with GPS system. This will allow the SVMS to continuously keep track of vehicles location. This data will be used to find the vehicles location during an accident or theft. The results of SVMS system were promising in terms of efficiently detecting the accidents, finding the severity of accident and also detecting the location of vehicle. In this vastly populated mechanical world, all the population is majorly dependent on vehicles and road transportation network to move from one place to another. Transportation has been a part of human growth from the start of civilization. As the population grows, the number of vehicles is also increased vastly.

According to US publisher ward's estimation, there has been around 1.05 billion vehicles on roads excluding off-road and heavy construction vehicles.According to World health statistics 2008, road traffic injuries are going to be 5th leading cause of death. According to global status report on road safety 2015 by WHO, there has been around 1.25 million deaths due to road accidents every year. It also shows that, the major deaths are due to lack of immediate medical attention during accidents. Even though the technology has advanced so much, still the accident prevention and detection mechanisms used are implemented decades ago and are all static measures like speed breakers, road signs etc.

Using any existing system, one cannot predict all accidents. Hence at least we must be able to detect accidents as early as possible. Any person or animal that is injured in an accident must be provided with medical treatment right away. Oftentimes, the people that are injured in accidents may not go for immediate medical treatment, either because of misjudging the injuries or due to the legal procedures involved in accidents. Even a person feels okay; there is no harm in being evaluated for any injuries. The main goal of SVMS proposed in this paper is immediately detecting accident, evaluating the driver's condition and informing it to the authorities.

KATTA SAI MOHAN
16F11A0433

SMART GLOVE FOR SIGN LANGUAGE TRANSLATION USING ARDUINO

Speech is the easiest way for communication in the world. It becomes difficult for speech impaired people to communicate with normal people as they use sign language for communication. When a speech-impaired person communicates with normal person, the bridge gap between speech impaired and normal masses is too much to fill. The gesture recognition can be done in two ways, Image processing based and sensor-based.

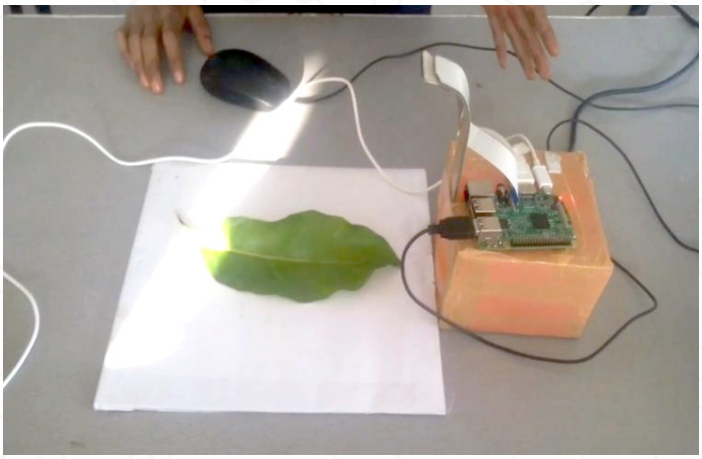
The Objective of the project is to design a smart glove for sign language translation that helps an easy way of communication for speech impaired or hearing-impaired people. In this project, glove need to be equipped with sensors such as Flex sensor, Accelerometer, Touch sensor which sense different sign language gestures. Flex sensors are placed on fingers which measure the bending of fingers according to a gesture made. An accelerometer is placed on the palm which measures the location of the hand in X, Y, Z axes. Touch sensors are placed in between the fingers and measures if there is any contact between the fingers. The sensed data from sensors is sent to Arduino UNO board for further processing and transfer data to an android phone via bluetooth module. The data we get will be in the form of text. This text data is then converted into speech through Google text -speech converter.

In the present world it is very complicated for the deaf & dumb people to talk with the ordinary people as impaired people lacks the amenities which a normal person should own. It actually becomes the same problem of two persons which knows two different language, no one of them knows any common language so its becomes a problem to talk with each other and so they requires a translator physically which may not be always convenient to arrange and this same kind of problem occurs in between the Normal Person and the Deaf person or the Normal Person and the Dumb person. Although technology has been evolving rapidly in this information age, deaf/mute people still use sign language as their only way of communication. Using sign language as a communication tool can be beneficial among those who are familiar with this language, but the problem remains when communicating with the wider community. Sign Language Translator is the appropriate solution that enables deaf/mute people to communication fluently through technology in different languages. As sign language is a formal language employing a system of hand gesture for communication (by the deaf). Many projects used glove-based systems for automatic understanding of gestural languages used by the deaf community. The systems developed in these projects differed in characteristics such as number of classifiable signs, which could range from a few dozen to several thousand, types of signs, which could be either static or dynamic, and percentage of signs correctly classified. The simplest systems were limited to understanding of finger spelling or manual alphabets (a series of hand and finger static configurations that indicate letters). Takashi and Kishino and Murakami and Taguchi used a Data Glove for recognition of the Japanese alphabets. For recognition of the American alphabet, Hernadez-Hezbollah used an Aculeolate. The more complex systems aimed at understanding sign languages,

a series of dynamic hand and finger configurations that indicate words and grammatical structures. For instance, Kim and colleagues used a Data Glove for recognition of the Korean language , Kadous a Power Glove for the Australian language, Vamplew a CyberGlove for the Australian language, Gao and colleagues a CyberGlove for the Chinese language, and Liang and Ouyoung a Data Glove for the Taiwanese language. Some systems embedded 2 interfaces for translating sign languages into text or vocal outputs. For instance, the Talking Glove used a Cyber Glove and recorded, recognized, and translated American sign language into text or spoken English.

DOMMARAJU SINDHU
17F11A0417

PLANT DISEASE DETECTION BY IMAGE PROCESSING



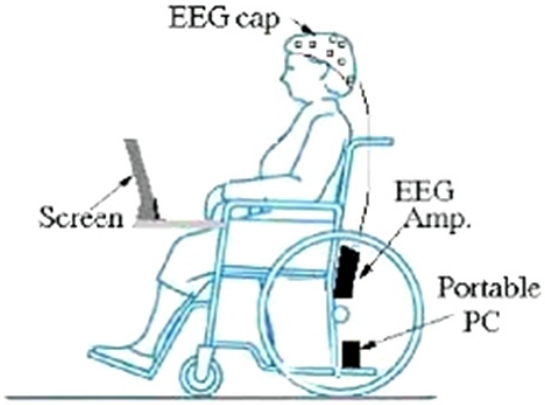
To promote sustainable development, the smart city implies a global vision that merges artificial intelligence, big data, decision making, information and communication technology (ICT), and the Internet-of-Things (IOT). These processes above are related for solving real life problems. Food is one of the basic needs of human being. World population is increasing day by day. So it has become important to grow sufficient amount of crops to feed such a huge population. But with the time passing by, plants are affected with various kinds of diseases, which cause great harm to the agricultural plant productions. Beside that many countries economy greatly depends on agricultural productivity and it's also a need for a coun try to attain agricultural productivity of basic agricultural product for the people of that particular country. Detection of plant disease through some automatic technique is beneficial as it requires a large amount of work of monitoring in big farm of crops, and at very early stage itself it detects symptoms of diseases means where they appear on plant leaves. In this paper surveys on different disease classification techniques that can be used for plant leaf disease detection.

Agriculture is the mother of all cultures. The focus is on enhancing productivity, without considering the ecological impacts that has resulted in environmental degradation. As disease of the plants is inevitable, detecting disease plays a major role in the field of agriculture. Plant pathogens consist of fungi, organism, bacteria, viruses, phytoplasmas, viriods etc. Three components are absolutely necessary for diseases to occur in any plant system and which may infect all types of plant tissues including leaves, shoots, stems, crowns, roots, tuber, fruits, seeds and vascular tissues. Therefore, detection and classification of diseases is an important and urgent task. The necked eye observation of experts is the main approach adopted in practice for detection and identification of plant diseases. However, this requires continuous monitoring of experts which might be prohibitively expensive in large farms. We can analyze the image of disease leaves by using computer image processing technology and extract the features of disease spot according to color, texture and other characteristics from a quantitative point of view. Due to which consulting experts even cost high as well as time consuming too. In such condition the suggested technique proves to be beneficial in monitoring large fields of crops. And automatic detection of diseases by just seeing the symptoms on the plant leaves make it easier as well as cheaper. This also supports machine vision to provide image based automatic process control, inspection, and robot guidance .Plant disease identification by visual way is more laborious task and at the same time less accurate and can be done only in limited areas. Whereas if automatic detection technique is used it will take less efforts, less time and more accurately. In plants, some general diseases are brown and yellow spots, or early and late scorch, and other fungal, viral and bacterial diseases. Image processing is the technique which is used for measuring affected area of disease, and to determine the difference in the colour of the affected area. In paper texture and other characteristics are also used from a quantitative point of view. In paper colour-based feature, K-means algorithm along with thresholding values is used for segmentation and identifying fungus. Image classification refers to the task of extracting information classes from a multiband raster image. The resulting raster from image classification can be used to create thematic maps. Depending on the interaction between the analyst and the computer during classification there are two types of classification. i) Supervised and ii) unsupervised.

There are currently many different ways of performing image classification, ranging from thresholding methods. This might be colour information, boundaries or segment of an image. Machine based approaches for disease detection and classification of agricultural product have become an important part of civilization. Paper presents a review on existing reported techniques useful in detection of disease.

CHALLA UPENDRA
18F11A0415

EEG CONTROLLED WHEELCHAIR



This article describes the development of a brainwave-controlled wheelchair. The main objective of this project is to construct a wheelchair which can be directly controlled by the brain without requires any physical feedback as controlling input from the user. The method employed in this project is the Brain-computer Interface (BCI), which enables direct communication between the brain and the electrical wheelchair. The best method for recording the brain's activity is electroencephalogram (EEG). EEG signal is also known as brainwaves signal. The device that used for capturing the EEG signal is the Emotive EPOC headset. This headset is able to transmit the EEG signal wirelessly via Bluetooth to the PC (personal computer). By using the PC software, the EEG signals are processed and converted into mental command. According to the mental command (e.g. forward, left...) obtained, the output electrical signal is sent out to the electrical wheelchair to perform the desired movement. Thus, in this project, a computer software is developed for translating the EEG signal into mental commands and transmitting out the controlling signal wirelessly to the electrical wheelchair. Most of these physically disabled persons are facing the difficulty to move around freely. Since the physically disabled person is one of the major contribution to total number of disabled persons, this indicates that the amount of disabled persons who lost their mobility are substantial.

Wheelchair is the most common device that used to provide mobility for the physically disabled person. However, most of the wheelchair today especially the affordable manual wheelchair requires human power to manoeuvre. Even for the electrical wheelchair, it still requires user's finger to move the joystick or press the button in order to control the movement of the electrical wheelchair. In this way, some users who completely lost their hands or those who having the difficulty to control their hands such as Poliomyelitis patients are not able to navigate the wheelchair movement. Hence, they are incapable to move around by themselves. With the intention to resolve this issue, another constructive way is by using the brain to directly control the movement of the wheelchair. This method will allow most of the people to navigate the wheelchair by themselves. Therefore, this will bring an extremely high impact, especially for the disabled individuals who are not able to communicate physically.

MANCHIKALAPATI VENKATA ESWAR TEJA
16F11A0446

BRAIN TWISTER

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