Real-Time Communication System Powered by AI for Specially Abled

LITERATURE SURVEY

Paper 1: INNOVATIVE STUDY OF AN AI VOICE BASED SMART DEVICE TO ASSIST DEAF PEOPLE IN UNDERSTANDING AND RESPONDING TO THEIR BODY LANGUAGE

Publication year: 2021

Author: Dhaya Sindhu Battina, Lakshmisri S

Journal Name: International Journal of Creative Research Thoughts(IJCRT)

Summary: In this paper, proposal is based on the rationale that a deaf person can be able to hear what they see through an AI voice-based smart device. This is a device that will read body language which is hand gestures. Hand gestures are often used by deaf individuals to interact with one another in everyday situations. The fundamental concept behind this proposed device is the capture of these hand movements using sensors installed inside the device and the processing of the signal into a voice. To monitor hand gestures, this device makes use of flex sensors and Inertial Measurement Units (IMUs) which are connected to a microcontroller on the motherboard. The microcontroller contains the CPU, memory, and AI programmable input/output peripherals. To detect the features of the hand, the system on this gadget makes use of image analysis, human-computer interaction, and neural network methods. This method will convert a video of a daily, regularly used proper sentence gesture into a text, which will subsequently be converted into audio.

Paper 2: SUPPORT FOR COMMUNICATION WITH DEAF AND DUMB PATIENTS VIA FEW-SHOT MACHINE LEARNING

Publication year: 2021

Author: Grigorii Shovkoplias, Mark Tkachenko, Arip Asadulaev, Olga Alekseeva, Natalia Dobrenko, Daniil Kazantsev, Alexandra Vatian, Anatoly Shalyto and Natalia Gusarova

Journal Name: International Conferences ICT, Society, and Human Beings 2021.

Summary: Improving healthcare quality and patient safety for patients with disabilities is one of the most important goals of e-Health. A large percentage of these patients are persons with disabling hearing loss, i.e. partially or completely deaf and dumb. In this paper, they discuss the opportunity of fast Sign Language processing having only a small number of examples. They investigated the possibility of classifying datasets with an extremely small number of samples of electromyograms of deaf and dumb gestures using few-shots learning methods. Several such methods have been considered - Matching Networks, Model-Agnostic Meta-Learning, and Prototypical Networks. The developed methodology makes it possible to train electromyogram classifiers using an extremely small amount of data for other deaf and dumb sign languages. To do this, it is enough to collect a small dataset for re- or additional training of these models for the classification of another language, which is easy to accomplish in practice by means of a small session of recording the gestures of several deaf-mute people - speakers of a particular sign language. They selected three main few-shot learning approaches and compared them on small sign language dataset. Based on results, one can choose the best models and their modifications to adapt to the practice task.

Paper 3: HAND TALK: INTELLIGENT SIGN LANGUAGE RECOGNITION FOR DEAF AND DUMB

Publication year: 2015

Author: S.Philomina , M.Jasmin

Journal Name: International Journal of Innovative Research in Science, Engineering and Technology.

Summary: The Proposed system introduces an efficient and fast algorithm for identification of the number of fingers opened in a gesture representing an alphabet of the Binary Sign Language. The idea consisted of designing and building up an intelligent system using group of Flex sensor, machine learning and artificial intelligence concepts to take visual inputs of sign language's hand gestures and generate easily recognizable form of outputs. The objective of this project is to develop an intelligent system which can act as a translator between the sign language and the spoken language dynamically and can make the communication between people with hearing impairment and normal people both effective and efficient. After recognizing the gesture the output are expressed in terms of voice and text for display.

Paper 4: A RESEARCH AND DEVELOPMENT OF A REAL TIME VISUAL-AUDIO TRANSLATOR FOR DIFFERENTLY ABLED PEOPLE.

Publication year: 2021

Author name: Mr. Dikshant B. Patil, G. D. Nagoshe.

Journal name: International Journal of Creative Research Thoughts.

Summary: In this paper derive a concept from the study of the various ideas and put forward a concept to help differently abled means disabled person to communicate by using a real-time visual-audio translator human computer interface, as by this the difficulty is to be removed. As by the ages the modes changes naturally first non-verbal then verbal it was all in nature be we have to progress, but by this a little but the significant population of people is been barred, as in this only country about at the most 3% people cannot speak as they are dumb or they cannot listen as by this they are deaf, and at the least 2% of the population is blind that is they cannot see. Hence the gestures and sign language is the non-verbal mode of communication for deaf or dumb people but by this all the people who have not familiar with this knowledge with them the communication can be barred by this means there have been to remove this barrier, a medium is develop by this the hand gesture is taken as input from the camera and then the image is been processed this is called image processing (with tensorflow) and the after that the gesture is recognized and text on the screen is been displayed and as for output the gesture which is recognized is been given out in the form of the sound (voice) from the speaker by this a dumb or deaf person can communicate with blind person. For another conversation from blind person to dumb or deaf person, as the blind person can speak in this the input is taken as speech from the microphone and then the speech recognition takes place and then the text is given out as on the screen which can be read by the dumb or deaf person as they can see, in this Speech processing is used. By this application communication between two disabled person and also between disabled person and other person can be done

Paper 5: REAL TIME INDIAN SIGN LANGUAGE SYSTEM USING ARTIFICIAL INTELLIGENCE

Publication year: 2022

Author: Jatin Jagani, Yogita Parikh, Vishal Savaliya, Gaudani Mohit

Summary: This paper presents approach to convert "Sign Language into speech using Artificial Intelligence in real time" for deaf and dumb people. Deaf and Dumb People feels difficulty to communicate with the ordinary people. The sign language of deaf and dumb is quite difficult to learn and it is not possible for everybody to learn that language. This approach helps to provide communication between people with speech impairment and normal people, thereby reducing the communication gap between them. This system capable of recognizing 26 gestures of letter from the Indian Sign Language by using Artificial Intelligence. The proposed system having Real time video acquisition, frame extraction and Pre-processing, Hand gesture segmentation, Sign recognition using AI, Text and audio output of letter. By using Webcam, capture the real time video of hand gestures for Indian sign language and extract the video frames from it. Brightness and orientation of frame is derived and if its value is not proper, then frame is rejected and it is acquired again. Sign gesture is segmented by using K-means clustering algorithm and morphological image processing. Sometimes there is difficult to segment the hand gestures due to different background conditions. A convolutional Neural Network recognize the letter of ISL with the 97% recognition rate. It is trained by using different segmented hand gesture of letters in different background conditions. Recognized gesture is used to convert sign into text and audio output for users.

Paper 6: HAND GESTURE RECOGNITION AND VOICE CONVERSION SYSTEM FOR DUMB PEOPLE

Publication year: 2015

Author: V.Padmanabhan, M.Sornalatha

Summary: The verbal exchange among a dumb and listening to individual poses to be an essential drawback in comparison to verbal exchange among blind and historic visible human beings. This creates an exceedingly little residence for them with verbal exchange being accomplice diploma basic issue of human life . The blind human beings can communicate freely through means that of historic language while the dumb have their very own manual-visible language called signal language. Sign language is likewise a non-verbal symbolization that is observed amongst deaf groups at periods the planet. A Dumb verbal exchange interpreter is likewise a device that translates the hand gestures to sensibility speech. A gesture in accomplice diploma extraordinarily language is likewise a positive motion of the arms with a specific type created out of them . A gesture in a signal language is a specific motion of the arms with a particular form produced from them. A signal language typically presents signal for entire phrases. It also can offer signal for letters to carry out phrases that do not have corresponding register that signal language. In this tool Flex Sensor performs the fundamental role, Flex sensors are sensors that alternate in resistance relying on the quantity of bend at the sensor.

Paper 7: SMART STICK FOR DIFFERENTLY ABLED

Publication year: 2018

Author: Akshita Abrol 1, Manoj Kumar2

Journal Name: International Journal of Scientific and Technical Advancements

Summary: Recently there has been a lot of Electronic Travel Aids (ETA) designed and devised to navigate independently and safely. It is well known that the disabled people carry a hand stick with them whenever they need a support. There may be an obstacle in their path but is not encountered by the person with the help of the stick. . Thus, a design has been developed to assist the blind and provide them a clear path. People with physical disabilities that affect movement can use mobility aids, such as wheelchairs, scooters, walkers, canes, crutches, prosthetic devices, and orthotic devices, to enhance their mobility. The project is based on a theoretical model and a system concept to provide a smart electronic aid for disabled people. This smart stick will perform the main task of identifying the obstacles in the part of the blind person. In addition to this a communication system is installed in which the stick is used to convey important messages. The stick utilizes the RF Module for turning on/off devices from a distant place. This paper put forwards the design of smart stick using microcontroller. Paper presents the design and implementation of obstacle avoidance module and wireless home appliances control module via smart stick. The system so devised is a low cost system and is highly scalable with less modification.

Paper 8: USE OF INTERNET OF THINGS (IOT) TO OVERCOME DIFFERENTLY ABLED COMMUNITY ISSUES

Publication year:2016

Author: N Wedasinghe1 1 General Sir John Kotelawela Defence University,

Journal Name: Proceedings in Computing, 9th International Research Conference-KDU, Sri Lanka

Summary: Human with different form of disabilities and in specifically people who are working with the impairment are not having equal opportunities to accessing Information technology and Internet access compare to the non-disabled population in the world and it is common for Sri Lankan disabled community . Sample selected from different communities, different disabled categories and different geographical locations. Findings indicated that basic level ICT technologies used by the differently abled community are statistically low. Therefore In the second phase of the study focuses on how could Internet of things (IoT) concept could successfully apply to overcome the disabled digital divide in the country. By bridging the gap through IoT concept, this community also could be an effective contributor for the national development process. There- fore, the purpose of this paper is to analyse how people with visual, hearing and physical impairments can interact with and benefit from the IoT

Paper 9: HAND GESTURE, TEXT AND SPEECH TRANSLATION AND RECOGNITION SYSTEM FOR SPECIALLY ABLED PEOPLE USING AI

Publication year:2020

Author: Naresh Thoutam, 2Deepak Kumar Jha, 3Lakshya Jaiswal 4Sanchit Deshmukh 5Rishabh Raj

Journal Name: Sandip Institute of Technology and Research Centre, Nashik, India

Summary: Communication is the main channel between people to communicate with each other. Since deaf and dumb people cannot communicate with normal person so they have to depend on some sort of visual communication. "Special people", that is people who have difficulty in speaking and hearing "The dumb" and "The deaf" people respectively find it difficult to understand what exactly the other person is trying to express and so with the deaf people. Sometimes people interpret these messages wrongly either through sign language or through lip reading or lip sync . Hence in this paper a glove is designed using flex sensor to communicate between Dumb and normal people and assigning particular message for each gesture .The gestures created by the glove will be sent to normal person's phone and will also be displayed on LCD. In this paper a Braille Embosser is designed to communicate with blind person having servomotors to imprint Braille characters with the advancement in the technology, there have been many innovations in regards with this disabled people but person with moderate income would not afford it. So the first and the foremost need of a society is to develop a system through which a person with disabilities can live a life that a normal person does. Disabilities like blind, deaf, dumb are more of serious concern. Science and Technology have made Human life addictive to comfort\but still there exists an underprivileged group of people who are fighting for finding a innovative way that can make the process of communication easier for them. According to the World Health Organization, about 285 million people in the world are blind, 300million are deaf and 1 million are dumb. In day to day life communication is major issue for deaf, dumb, blind people. This paper "A Novel Approach to Communicate with Deaf, Dumb and Blind Person" removes the barrier of communication between them and normal person.

Paper 10 : SMART COMMUNICATION FOR DIFFERENTLY ABLED PEOPLE

Publication year: 2019

Author name: R. Bhavani , B. Poornima, M. Surya Bharathi , M. Saraswathi.

Journal name: International Journal of Research in Engineering, Science and Management.

Summary: In our day to day life most of the task we carry out involves speaking and hearing. The deaf and dumb people have difficulty in communicating with others who cannot understand sign language and misinterpreters. In this paper, we designed a simple Embedded System based device for solving this problem. We have used flex sensor for getting the data from the deaf and dumb using sign language. When deaf wants to convey any messages then the user will give his voice as input to the android based voice app. Then the app will transfer this particular speech in to text and it will displayed in LCD. For Dumb People if they want to convey any messages to user Two Flex sensors are used to play voice. For Blind People, if they want to read any books or text the camera will act as eye to capture the text region and using Tesseract it will convert in to voice.

Paper 11: SIGN LANGUAGE ASSISTANT FOR SPECIALY ABLED
Publication year:2022
Author: 1Vanshika Gupta, Tanishq Sharma2, Saksham Sharma3, Saurav Pant4, Yash Kumar
Journal Name: International Journal of Advanced Research in Computer and Communication Engineering

Summary: The language they can use is sign language. (Sign language - a means of communication for the deaf and hard of hearing). Includes simultaneous use of the following: facial expressions, posture and hand movements, fingerspelling, body language, head movements, eye contact. In this project, we will translate sign language into real-time and tracking .A research problem that is important in computer vision is the ability to communicate with deaf people. This system introduces effective and fast paced fingerprint identification techniques that represent the sign language alphabet. Indian Sign Language (ISL) uses both hands to represent the letters of the alphabet and to touch. At first we must keep the relevant and predefined gestures on the local database. When the user makes any appropriate hand gestures in front of the camera, the symbols are taken The symbols are then stored on the local database. When the user makes any appropriate hand gestures in front of the camera, the symbols are taken .The symbols are then stored on the local database. The captured image is processed to remove the background. The extracted features are compared using a pattern matching algorithm. To calculate brand recognition, features are compared with the test database. Finally, the visual touch is converted into text. At first we must keep the relevant and pre-defined touch on the local database. When the user makes any appropriate hand gestures in front of the camera, the symbols are taken .The symbols are then stored on the local database. These processed images are processed to extract the feature. The extracted features are compared using a pattern matching algorithm. To calculate hand recognition, features are compared with the test database .Finally, the hand gestures is converted to text and displayed on the screen.

Paper 12: DUMB WITHOUT DEAF PEOPLE SPEECH RECOGNITION BY USING ARTIFICIAL INTELLIGENCE

Publication year: 2019

Author: 1 Manyam Harish Reddy, 2 Md Km Chisti, 3 Vamsi Reddy Atchi

Journal Name: International Journal of Electrical, Electronics and Data Communication

Summary: Recently, lots of research has been directed towards natural language processing. However, the vocal cord frequency, which serves as primary means of communication for dumb people, has not yet been extensively explored, because it is not a language that can be easily understood. Information Communication Technology (ICT) can support people with physical disabilities by enabling them to access the information along with others. In this paper, The primary aim lies in capturing the vocal cord frequencies of the dumb without deaf people and converting them into sound by using Short Time Zero Crossing (STZC) method. In this paper a novel humanitarian technology developed to aid dumb without deaf people using Artificial Intelligence at low cost and by using deep learning they are trying to train the brain. They use a time varying Fourier transform to study the spectral properties of vocal cord frequency signals. Therefore, they can try to identify between vocal track system and input signals which are related with different words in this paper, short time Fourier transform (STFT) is used to analysis the vocal cord frequency signal.