Artificial Communication System For Deaf And Dumb With Sign Extension

P.Devi[1], K.Hemalatha[2], S.Saundarya[3], Ms.M.Geethapriya[4]

[1, 2, 3, 4] Dept of Computer Science Engineering

[1, 2, 3, 4] N.S.N College Of Engineering and Technology ,Karur, India,

Abstract- *Sign language in itself is the only tool of communication for the society which is not able to hear voices and speak words. Using sign language, they can express their emotions and thoughts and can convey what they want to say. But not everyone understands sign language, only the people who require it do. So people with such kinds of handicaps need a translator with them in order to convert their language to a common tongue and that's the main reason of sign language recognition becoming such a crucial task. In this project, a communication system has been proposed which converts sign language used by dumb people into speech. It is done based on the novel hand gesture recognition technique. This solution approach consists of a hardware module and software application. In hardware module - The Gesture recognition is done with the help of the camera based co-ordinate points accessing system is done. Here Feed forward neural network and Gaussian Feature Filtering algorithm implemented to train and test the process of hand recognition system with the chat-based approach. The voice conversion process implements Hidden Markov Model (HMM) which converts the text as voice signals. The entire process of speech synthesis has been tested and the test results displaying the alphabets and words have been shown. The system shows an automatic translator with four languages Tamil, English, Hindi, Malayalam where it will be more efficient for other language people to communicate makes a main advantageous one. Thus the produced system gives out an easiest communication processing for the dumb people to the normal people with the speech system. The implementation carried out with multiple analysis and gives out a highest trained value outputs as speech. With the developed approach normal and the speech disability people can make a chat and get a translator whenever they need.*

I. INTRODUCTION

Artificial Intelligence is an approach to make a computer, a robot, or a product to think how smart human think. AI is a study of how the human brain think, learn, decide and work. The aim of AI is to improve computer functions which are related to human knowledge, for example, reasoning, learning, and problem-solving.

Communication among deaf-mute people and normal people is more difficult because normal people cannot perceive the speculation and feeling of deaf-mute people. There are two ways of approach for gesture recognition. In non-vision based approach, sensors such as flex sensor and pressure sensor are used for sign recognition which don't require any proper lighting. In vision based approach, Real Time gesture image made by deaf-mute

II. LITERATURE REVIEW

Automated chat systems or chatbots are quite popular nowadays. Automated chat systems can be voice based chat system or text-based chat system. Voice based chat systems, to recognize the speech or instruction from the speaker and to give a suitable answer or to follow the given instructions is quite developed in English and some other widely used languages. Though Bangla is the primary language of 210 million people, Bangla language-based voice chatbots are not that common. The target of the proposal is to develop a simple voice chat system in Bangla language by using speech recognition technology and Artificial Intelligence, which can take an audio input, and give a relevant audio output for that.

Hand gesture recognition is an attractive research field with a wide range of applications, including video games and telesurgery techniques. Another important application of hand gesture recognition is the translation of sign language, which is a complicated structured form of hand gestures. In sign language, the fingers' configuration, the hand's orientation, and the hand's relative position to the body are the primitives of structured expressions. The importance of hand gesture recognition has increased due to the prevalence of touchless applications and the rapid growth of the hearing-impaired population. However, developing an efficient recognition system needs to overcome the challenges of hand segmentation, local hand shape representation, global body configuration representation, and gesture sequence modeling. A novel system is proposed for dynamic hand gesture recognition using multiple deep learning architectures for hand segmentation, local and global feature representations, and sequence feature globalization and recognition. The proposed system is evaluated on a very challenging dataset, which

consists of 40 dynamic hand gestures performed by 40 subjects in an uncontrolled environment. The results show that the proposed system outperforms state-of-the-art approaches, demonstrating its effectiveness.

III. EXISTING SYSTEM

There are two stages in the method. First, to propose a multiscale perception strategy to facilitate video representation by weakly supervised learning. Second, to learn an agent called SBD-RL to detect the semantic boundaries in videos by reinforcement learning. The two stages are trained separately. The output of the first stage is used as the input of the second stage. In this section, to expound the two stages separately. It is shown as wearable distinguishing glove with embedded hetero-focal component optic nerve, which uses hetero-focus fiber optic nerve as sensors that perceive finger flexion to achieve unconstrained hand development checking.

The sensor Hetero focus contains a transmission fiber line whose expensiveness is 9µm. single technique for transmission is used in Hetero focal component sensor back of the hand with the ultimate objective that never affected by wrinkles in the glove joints. A laser diode of wavelength 1.31µm and an optical influence meter are used to check the transmission setback. Joining machine is also used. The sensor after modification can distinguish the joint edges of the fingers with complexities near to estimate and the hetero-focus recognizing methodology empowers the identifying glove to be worked with a base number of sensor centers. The hetero focus sensors reveals monotonic characteristic of optical incident execution with respect to the flexion purpose of joints. The PRAM is fitting with outright 10 degrees of chance and contains four units. To achieve control help development, a PI control, which relies upon weight a motivating force from an inflatable sensor is performed to grow sensor makes the associated part free from the power. EMG instances of muscles are evaluated to survey the power help execution. The system ends up being progressively befuddled and enormous.

1. Video representation by weakly SL   2. Semantic boundary detection by RL
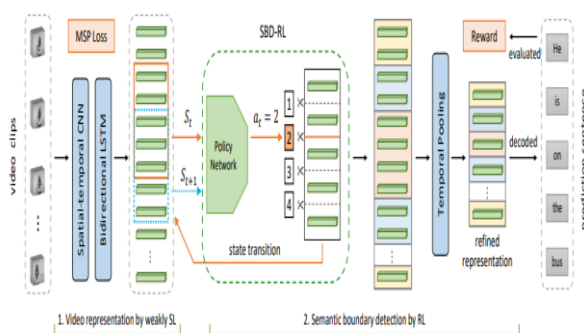
IV. PROPOSED SYSTEM

In the proposed system, a supervised learning approach is enhanced on the hand based gesture recognition. Here a communicative approach has been lent to the process of the disability people communication. Feed forward neural network approach provided with the classification of the multiple symbol recognition. The trained features are getting matched with the symbol recognized and the extracted feature points are well known. Here Hidden Markov Model (HMM) algorithm proposed to convert the voice model and the hand based model. The text matched is converted to voice signals and make a easy chat application. To present a system display that can therefore see sign language to help normal people with imparting even more suitably with the gathering or talk of ruined people. This endeavor includes a controller interfaced with camera and Voice play back circuit. By using a camera to convey particular motions, for each motion to code a voice track .So other conventional individuals will easily fathom individual. The Recognition of sign language involves pre-processing level and classification level. Pre-processing level involves gray scale conversion, noise reduction, background subtraction, brightness normalization and scaling operation. Real Time gesture made by deaf and mute people is captured in various orientations. This is used as database image. Real time gesture is captured and it is given as input to the preprocessor stage. The color image is converted into gray scale for better classification. Noise can be added to the image and median filter is used to reduce the unwanted noise component and to remove the unwanted background present in image.

Advantages of proposed System:

- Easy chat application is developed for the dumb and the blind people
- The accuracy of the Feed Forward Neural Network classification is 97%
   - HMM based voice conversion makes effective approach for deaf and dumb people

V. SYSTEM ARCHITECTURE

A system architecture is the conceptual model that defines the structure, behavior and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behavior of the system. System architecture can comprise system components, the externally visible properties of those components, the relationships between them. It can provide a plan from which products can be procured, and systems developed, that will

work together to implement the overall system. There have been efforts to formalize languages to describe system architecture; collectively these are called architecture description languages.
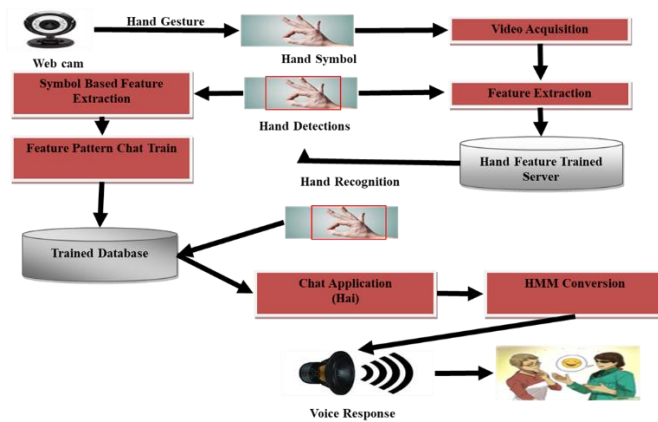
MODULES

- Video Acquisition
- Frame Conversion
- Gaussian Feature Extractor
- Hand Detection
- Feed Forward Neural Network Detection
- Chat classification
- HMM Conversion

VI. CONCLUSION

The main purpose is to help the deaf and dumb people. This Hand gesture recognition and voice conversion system can help the speech impaired people to communicate with normal people in the real world. In order to express the wanting, or in the case of emergency or to express the feelings, communication plays a major role, useful tool for speech impaired and partially paralyzed patients which fill the communication gap between people. Sign language is one of the useful tools to ease the communication between the deaf and mute communities and normal society. Though sign language can be implemented to communicate, the target person must have an idea of the sign language which is not possible always to hence lowers such barriers.