

A Recent Overview on Usage of Indian Sign Language

Dr. B. Anand ^{#1}, P. Kokila ^{*2}

^{#1}Assistant Professor, Head, Department of Computer Science, Govt. Arts College, Udhamandalam
¹meetbanand@gmail.com

^{*2}Ph.D Research Scholar, Department of Computer Science, Govt. Arts College, Udhamandalam
²kokilaphd123@gmail.com

Abstract— A system to recognize static gestures representing the words has been placed onto the system. The recognition of handmade gestures in certain sequence of image enables a human-computer interaction applications. Human Computer Interaction moves forward in the field of sign language interpretation. Indian Sign Language (ISL) Interpretation system is a good way to help the Indian hearing impaired people to interact with normal people with the help of computer. Vision based hand gesture recognition system have been discussed as hand plays vital communication mode. This work consist of three phases. First phase is pre-processing, in which images are processed through some steps such as reducing distortion and greyscale conversion. Greyscale image is taken so that it shapes and then descriptors can be applied easily to extract the required features.

Index Terms--Hand Posture, Vector Classification, Pattern Matching, HGR, Machine Learning.

I INTRODUCTION

At the beginning of 20th century, no one knew about this. Even Deaf people who are using the sign language don't know what it was. Some noticed that as many thoughts are expressed various signs and in English as assumption is made that sign is a non linguistical form of English. Most people around the globe thinking that it was a law or rule to express English language words in the form of signs it is also called as a replacement for speech. As the fact came out in second half of the 20th century. Sign language is a language used graphical model. It is sophisticated and complex as speech

language. It is primarily developed for the use of Deaf people. The brain can't tell the difference between the movement made by the fingers in the hand and lips. The language development is relationally controlled by the brain. Sign language is not universal language, it is opposed to common belief among normal speakers (those who hears). Sign language is made up of a non-perfect system of gestures. Numerous linguistic studies show that sign languages having certain rules for grammars, sentence, pronunciation, morphs, and other relating features similar to existing language which we speaks. Signed languages have their own difficulties.

II USES

There are many livelihood applications being developed day to day.

Loud Venue: If you are in a factory, mines and bore well digging then there will be more noise to have a conversation with others. Using sign language, you can converse effectively over certain distance in spite of how much background noise there is.

Eating: During eating you have food in your mouth if anybody asks question! You will finish chewing the food which was present in your mouth and then answer their

question. During this time, the mouth is filled with foods and now you must chew completely before reply their question.

Listening to Headphones: You are listening audio with the help of headphones and you need to speak with someone, sign language will be useful at that time.

Motorcycle Helmets: During riding two wheelers if we wear helmet it is very difficult to speak and hear. If we use sign language it is very easy to continue conversation.

Stage Events: At recording theatre, or similar areas communication is difficult at this time we can use sign language to start over conversation by signs.

Service Industry: You are providing a catering service to a formal party and need to communicate with the chefs of various streams during the event.

Theatre: During shooting a film a director can communicate over sign language to reduce disturbance of others.

At The Movies: It always happens. If we are watching movies in theatre and to talk with friends who came with you. However, getting into a conversation will give trouble to neighbours.

Stadium Event: If you are in the stadium watching cricket match, some of your folks are seated away from you.

Private Conversation: Now you and your friend going to a restaurant if you want to start a private speech it is very difficult because it is a public area, many people are around to you. If you want to talk privately with your friend it is very easy when you using sign language.

Radio Station: If you are in sound room of a radio station in which many people participate in live show. With sign language you can communicate with the staffs in the sound room during a live program without disturbing the program venue.

Recording Studio: Now in recording studio of a movie or in general. If anybody speaks in sound proof room, sound engineer who is outside of the room can't interact so using signs sound engineer can communicate with concern easily.

Military Operations: You are on a special assignment and to maintain pin drop silence. With sign language communication can be done clearly with respective teams. To communicate long distance we can use binoculars, who you can communicate over longer distances easily.

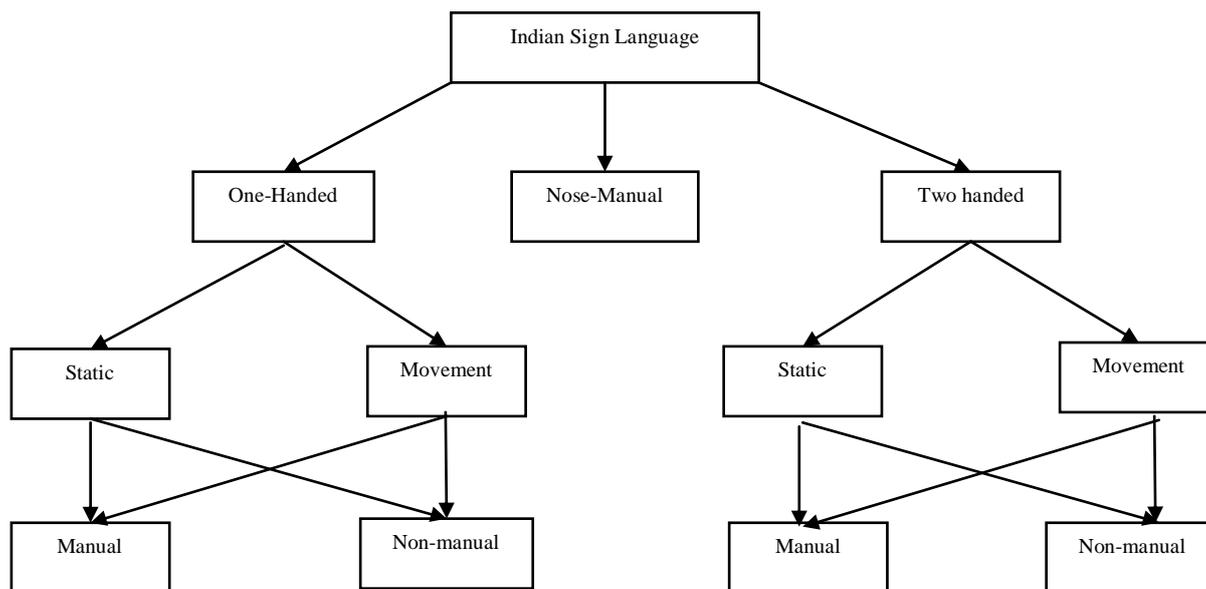
III EXPERIMENT

Sign language is not recognized as universal language. Sign language recognition has many disciplines in research areas, which involves pattern matching, vision used by computers, language processing and psychology. The module is for converting normal English sentences in to SL (to be understood by deaf people). After study and investigation, it was found that there is a relation between human gesture and speech. Speech expression can be replaced by signs going from gesticulation to sign language. ISL is a visual language. It is having grammatical information in the form of hands, face, arms and head/body posture and movements. Visual channel is active in sign language like speech channel in spoken language.

The ISL type hierarchy, which could help for design of such system. It is broadly categorized into

- 1) Manual (hand shape, hand movements, location, position)
- 2) Non-manual (facial expression, eye gaze and head/body posture).

In ISL, there are one handed and two handed signs which can be static and dynamic (movement). In two handed sign, some sign contains both hand active (type 0) and some sign contains dominant hand more active than non-dominant hand (type 1). Before begin to design of any sign language artistic system, it is advisable to go through corresponding sign language hierarchy.



IV HAND GESTURE

Though it is found that hand plays active role in sign language but due to its complex articulated structure consisting of many connected links and joints, hand gesture recognition becomes a very challenging problem. The human hand, with total 27 degree of freedom (DOF) considering hand wrist. There are widely two terms used in hand gesture recognition system:

- 1) Hand posture (static hand gesture) and
- 2) Hand gesture (Dynamic hand gesture).

In hand posture, no movements are involved whereas; hand gesture is a sequence of hand posture connected by movement over a period of time. In dynamic hand gesture, again two aspects are considered such as local finger motion without changing hand position or orientation and global hand motion where, position or orientation of hand

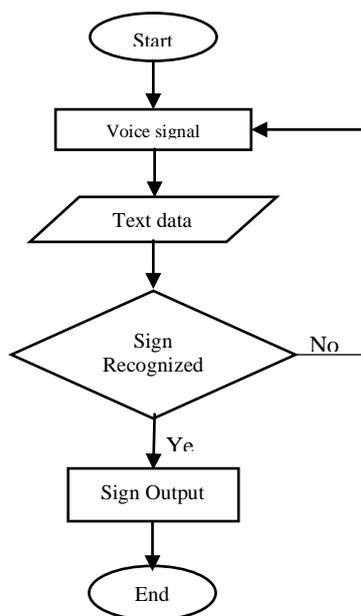
gets changed. To develop any recognition made by hand gesture it is necessary to know about skeleton structure of hand.



V. VISION BASED HAND GESTURE

In any typical hand gesture recognition, a strong set of description and representation are required. In the current state of the artistically representation, there are some limitation of data glove/sensor based approaches, vision based (appearance based) and 3-D hand

model based approaches are being used. One of the major tasks in hand gesture recognition is the description i.e. what gesture is recognized. Various methods are used in the literature such as, statistical and synthetic approaches. By representing in statistical methods, one can represent it, in the form of feature vector and then apply classification and recognition algorithm; whereas synthetic gesture recognition gesture can be represented in the form of tree, string or graph and decision rule such as graph matching, decision tree and string matching. Now days in the field of Human Computer Interaction, Hand Gesture recognition [HGR] is an active research topic. Recognizing gesture is a complex task which involves many aspects such as object detection, object description, modelling the motions, analysis of motions, pattern matching and machine learning even psycholinguistic studies also required



VI RESULT AND DISCUSSION

The major objective of this paper was to give significance of ISL as an interpretation language and focus on various methods/techniques available for vision based hand gesture recognition. Researchers are facing major problem of availability of standard database. Major work is going on for ISL multilingual multimedia dictionaries. Many researchers working on their own data. The deaf assistive system can bridge the communication gap between hearing impaired and normal people without isolating them in the Society. This paper is focussed on challenges for vision based and sign language interpretation system, to give an overall glance of sign language representation need, existing image processing and pattern recognition techniques available in the literature. It will be a great contribution to the Indian hearing impaired through working on Indian sign language, so that they are enabled to become self-respecting citizens and despite their deafness and muteness can play a useful role in the society. Every God creature has an importance in the society, remembering this fact, let us try to include hearing impaired people in our day to day life and live together.

VII CONCLUSION

Sign language recognition is a wide area of research. The aim of this work is to develop a sign language recognition system for deaf-dumb people. In this project, an image processing technique has been presented and designed for recognizing the signs of language for deaf-dumb persons. In this work more data has been collected and processed. Static hand gestures are taken. So, a large set of data are processed with extracted features called moment descriptors which are classified by using the Proximal Support Vector Machine classifiers. The results of the classification technique is evaluated and found that Proximal Support Vector Machine works as well with more accuracy. The work presented in this paper recognizes static signs only. In future, the work can be extended to recognize the dynamic signs of Sign Language. Now, the system deals with images with, uniform background, but it could be made background independent.



REFERENCES

- [1] Aleem Khalid Alvi, M. Yousuf Bin Azhar, Mehmood Usman, Suleman Mumtaz, Sameer Rafiq, Razi Ur Rehman, Israr Ahmed T , —Pakistan Sign Language Recognition Using Statistical Template Matching, World Academy of Science, Engineering and Technology, 2005.
- [2] Byung-woo min, Ho-sub yoon, Jung soh, Takeshi ohashi and Toshiaki jima, —Visual Recognition of Static/Dynamic Gesture: Gesture-Driven Editing System, Journal of Visual Languages & Computing Volume10, Issue3, June 1999, Pages 291-309.
- [3] U. Zeshan, “ ‘A’ level Introductory course in INDIAN SIGN LANGUAGE”, Ali Yavar Jung National Institute for Hearing Handicapped, Mumbai, 2001, pp. 1-38.
- [4] P. Garg, N. Agrawal, S. Sofat, “Vision based Hand Gesture Recognition”, Proceedings of world Academy of Science, Engineering and Technology, Vol.37, 2009, pp. 1024-1029.
- [5] U. Zeshan, M. Vasishta, M. Sethna, “Implementation of Indian Sign Language in Educational Setting”, Asia pacific Disability Rehabilitation Journal, Vo.16, No.1, 2005, pp. 16-39
- [6] G. R. S. Murthy and R. S. Jadon, "A review of vision based hand gestures recognition", International Journal of Information Technology and Knowledge Management, Vol. 2 (2), 405-410, 2009
- [7] sq Feng-Sheng Chen, Chih-Ming Fu and Chung-Lin Huang, "Hand gesture recognition using a real-time tracking method and hidden Markov model", Image and Vision Computing, Vol. 21, 745–758, 2003.
- [8] Jeroen F. Lichtenauer, Emile A. Hendriks, and Marcel J.T. Reinders, "Sign Language Recognition by Combining Statistical DTW and Independent Classification", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 30 (11), 2040-2046, 2008.
- [9] C. Vogler and D. Metaxas, —A Framework for Recognizing the Simultaneous Aspects of American Sign Language, Computer Vision and Image Understanding, 2001, vol. 81, no. 3, pp. 358-384
- [10] W. Gao, G. Fang , D. Zhao, and Y. Chen, —Transition Movement Models for Large Vocabulary Continuous Sign Language Recognition, Proc. Sixth IEEE Int’l Conf. Automatic Face and Gesture Recognition, May 2004, pp. 553-55.