IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 41-44

Expressive and Deployable Hand Gesture Recognition for Sign Way of Communication for Visually Impaired Peoples

J.Sanmathi Sri[1], S.Priyadharshini [2]
[1](, PG Scholar, Arunai Engineering College,Thiruvannamalai)
[2](Assistant Professor,Arunai Engineering College,Thiruvannamalai)

Abstract-*To Improve Our Communication Between The Normal And Visually Impaire8d Peoples .We Go For The Sign Way Of Communication Is One Of The Most Effective Communication Tool For The People Who Are Not Able To Speak Or Hear Anything. Sign Language Is Boon For The Deaf And Dumb People. Sign Language Is The Combination Of Different Gesture, Shape And Movement Of Hand, Body And Facial Expression. With The Help Of Sign Language, These Physical Impaired People Express Their Emotions And Thoughts To Other Person. Hence Sign Language Recognition Has Become Empirical Task. Since Sign Language Consist Of Various Movement And Gesture Of Hand Therefore The Accuracy Of Sign Language Depends On The Accurate Recognition Of Hand Gesture. This Project Present Various Method Of Hand Gesture And Sign Language Recognition Proposed In The Past By Various Researchers.*

Keywords-*Dump, Deaf, Sign Language, Gesture, Recognition*

I. Introduction

Recognition Of Sign Language Is One Of The Major Concerns For Dump And Deaf People. Sign Language Recognition Is A Research Area Involving Pattern Recognition, Computer Vision, Natural Language Processing. Sign Language Recognition Is A Comprehensive Problem Because Of The Complexity Of The Visual Analysis Of Hand Gesture And The Highly Structured Nature Of Sign Language. As Well As It Is Considered As A Very Important Function In Many Practical Communication Applications, Such As Sign Language Understanding, Entertainment, And Human Computer Interaction (HCI). Among

Natural Human Gestures Occurring During Non-Verbal Communication, Pointing Gesture Can Be Easily Recognized And Included In More Natural New Human Computer Interfaces. The Video Streams Of Backgrounds Are Frequently Influenced By The Background Changes Such As Illumination Changes And Changes Due To Adding Or Removing Parts Of The Back-Ground. Therefore, The Quality Of The Foreground And The Segmented Image Of Hand Gesture Severely Drop. The Novel Method Proposed In [1] Is Based On Difference Background Image Between Consecutive Video Frames, Of Using The "3σ-Principle" Of Normal Distribution For Hand Gesture Detection To Cope With The Problem. The Adaptive Method Of Automatic Threshold Selection Based On The Method Of Maximal Between-Class Variance Is Proposed For Hand Gesture Segmentation To Select Optimal Threshold. Lee [2] Proposed A Method To Recognize Hand Gestures Extracted From Images With Complex Background For More Natural Interface. This Method Is Based On Obtaining The Image Through Subtract One Image From Another Sequential Image, By Measuring The Entropy, Separating Hand Region From Images, Tracking The Hand Region And Recognizing Hand Gestures. The Limitation For Ycbcr Segmentation Method Is That Background Should Be Plain And Uniform. Rokade [3] Proposed RGB Segmentation Which Is More Sensitive To Light Conditions And The Threshold Value For Conversion Of Output Image To Binary.

II. Literature Survey

Many Novel Methods Have Been Developed In Past Few Years, To Facilitate Communication Between The Sign Language Users And Those Who Cant Speak Sign Language. The Gesture To Speech System, G2S, Has Been Developed Using The Skin Color Segmentation. The System Consists Of Camera Attached To Computer That Will Take Images Of Hand Gestures. Image Segmentation & Feature Extraction Algorithm Is Used To Recognize The Hand Gestures Of The Signer. According To Recognized Hand Gestures, Corresponding Pre-Recorded Sound Track Will Be Played [1].This Work Is To Develop A System For Recognizing The Sign Language, Which Provides Communication Between People With Speech Impairment And Normal People, Thereby Reducing The Communication Gap Between Them. Compared To Other Gestures (Arm, Face, Head And Body), Hand Gesture Plays An Important Role, As It Expresses The User's Views In Less Time. In The Current Work Flex Sensor-Based Gesture Recognition Module Is Developed To Recognize English Alphabet Sand Few Words And A Text-To-Speech Synthesizer Based On HMM Is Built To Convert The Corresponding Text [2]. This Paper Presents Design And Implementation Of Real Time Sign Language

Recognition System To Recognize26 Gestures From The Indian Sign Language Using MATLAB. The Signs Are Captured By Using Web Cam. This Signs Are Pre-Processed For Feature Extraction Using HSV Colour Model. The Obtained Features Are Compared By Using Principle Component Analysis (PCA) Algorithm. After Comparing Features Of Captured Sign With Testing Database Minimum Euclidean Distance Is Calculated For Sign Recognition. Finally, Recognized Gesture Is Converted Into Text And Voice Format. This System Provides An Opportunity For A Deaf-Dumb People To Communicate With Non-Signing People Without The Need Of An Interpreter [3]. Sign Language Is A Useful Tool To Ease The Communication Between The Deaf Person And Normal Person. The System Aims To Lower The Communication Gap Between Deaf People And Normal World, Since It Facilitates Two Way Communications. The Projected Methodology Interprets Language Into Speech. The System Overcomes The Necessary Time Difficulties Of Dumb People And Improves Their Manner. This System Converts The Language In Associate Passing Voice That's Well Explicable By Deaf People. With This Project The Deaf-Mute People Can Use The Gloves To Perform Sign Language And It Will Be Converted Into Speech; And The Speech Of Normal Person Is Converted Into Text And Corresponding Hand Gesture, So The Communication Between Them Can Take Place Easily [4].

III. Existing System

In The Current System,A Glove With Attached Flex Sensor Are Worn On The Hand .The Sensor Attached With Glove Capture The Hand Movement And Position. In This Method Hand Detection Is Not Required. One Of The Advantage Of This Method That It Provides Accurate Position, Orientation Of The Hand, Fingers Of The Palm. The Demerits Of This Method That It Requires The User To Connected With The Computer Physically Which Make It Very Uncomfortable Technique. This Method Is Also Expensive Due To The Use Of Sensory Gloves.

Disadvantage

It Is Difficult To Understand These Language Therefore Often These Physically Challenged Has To Keep The Translator Along With Them To Communicate With The World.

It Is Too Expensive Due To The Use Of Flex Sensor

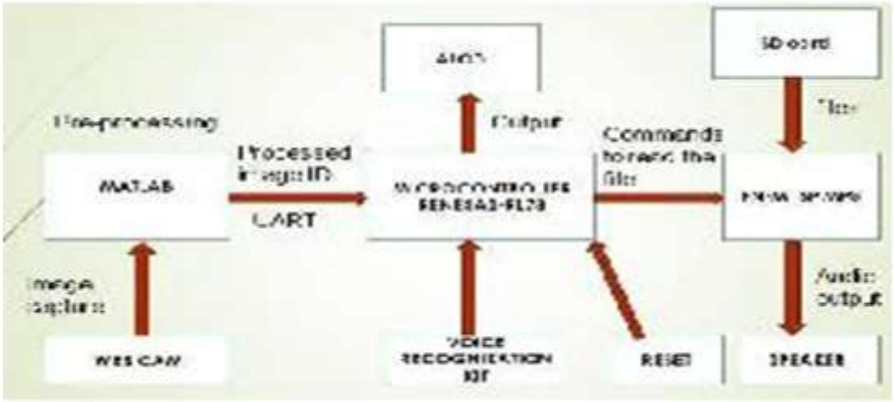
IV. Proposed System

In The Proposed System, We Recommend That The Gesture Of Human Body Part Is One Of The Important Tool For Representing The Expression And It Is The Way To Establish A Communication Between Human And Computer In Virtual Environment. This Sign Way Of Communication Is Used To Capture The Gesture And Posture Of The Hand. In This Project We Establishing An Approach Ie., Vision Based Approach. This Approach Requires Camera For Capturing The Hand Gesture Or Body Part Gesture This Gesture In The Form Of Video Or Images Is Then Given To The Computer For Recognition Purpose. This Approach Is Most Suitable For Real Time Application Has Many Challenges Like Background Problems, Variation In Lighting Condition, Color Of Skin Etc. Recognition Time, Computational Complexity, Robustness Are Some Of The Constraint Poses By The System.

Advantage

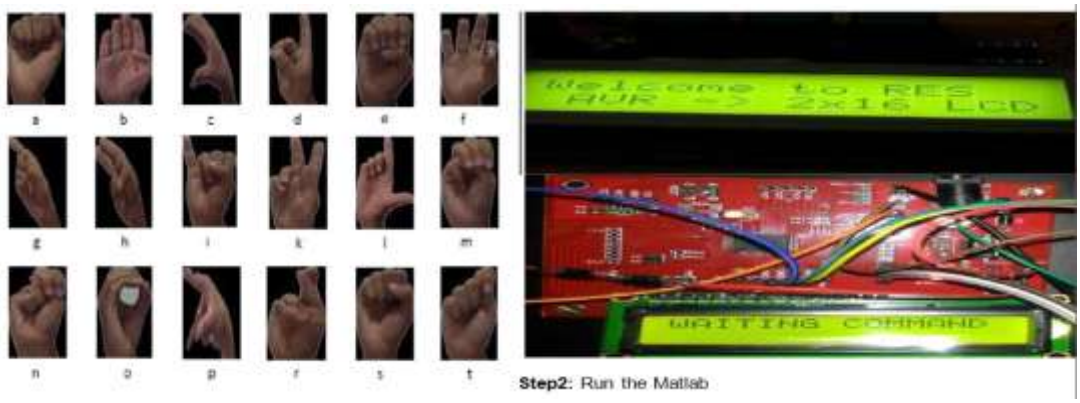
It Is Simple, Natural And It Directly Interact The User With The Computer. This Technique Uses Some Of The Characteristics Of Images Like Color, Texture For Analyzing The Gesture Of Hand Or Other Body Parts.

It Is Used For Extracting, Segmenting Or Detecting The Hand Object From The Image



V. Dataset

Single Image Of Each Character From Dataset For Gesture Recognition Is Shown. Increasing Number Of Images In Dataset Will Increase Accuracy Of The Recognition. For Creation Of Dataset We Used Preprocessing, PCA Algorithm On The Captured Image And Thus Created Image Is Resized And Saved.



Step2: Run the Matlab

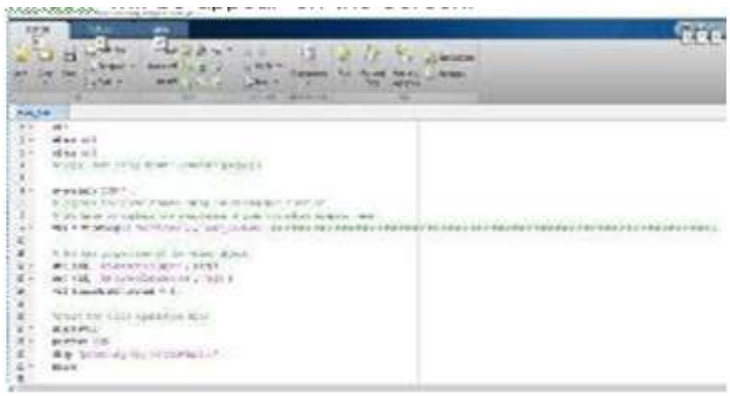
VI. Implementation

The Code Designed To Detect Hand Gesture Images And To Send The Corresponding Id's Will Be Executed, Webcam Will Be Initialized And Opens The Preview Window. Press Any Key In The Command Window Of The MATLAB Hand Gesture Detection
Window Will Be Appear On The Screen.

Fig: Experimental setup

Step 1: Initialize The Components

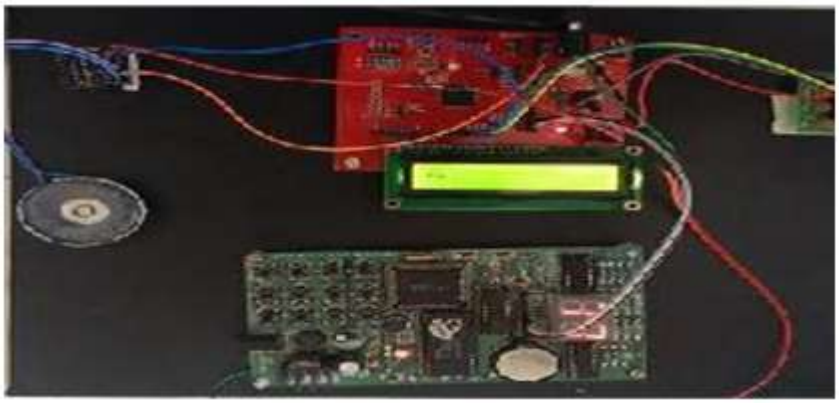
The ALCD Connected To The Microcontroller Will Display The Message "WELCOME" And The FN-M16p Mp3 Player Will Speak Out Hello Message. After The Initialization The ALCD Will Display "WAITING COMMAND" Which Means It Is Ready To Receive The Command.



Step3: The Gestures Are Provided By The Deaf And Dump By Using Sign Language.

Step 4: The ID's Sent To Microcontroller Will Be Processed By Showing It On The ALCD And FNM16P Mp3 Player Will Play The Meaning Of The Gesture Of Show Gesture.

Step 5: The Voice Recognition Module Which Is Speaker Dependent Module Will Send The Id To The Microcontroller Which In Turn Helps In Displaying The Output That Will Be A Full Duplex Communication.



VII. Conclusion

In Our Project Aims To Improve Our Communication Between Normal And Physically Impaired People By Introducing An Computer In The Communication Path So That The Sign Language Can Be Automatically Captured, Recognized And Translated To Speech For The Benefit Of Blind And Dumb People. In The Other Direction, Speech Must Be Analyzed And Converted To Textual Display On The Screen Of ALCD.

References

[1] Prof. R R.Itkarkar And Dr.Anil, V Nandi," HandGesture To Speech Conversion Using Matlab," ICCCNT 2013 July 4-6, 2013, Tiruchengode,India.

[2] Aarthi.M And Vijayalakshmi.P,"Sign Language To Speech Conversion,"2016 Fifth International Conference On Recent Trends In Information Technology.

[3] Arthi M And Vijayalakshmi P,"Sign Language Recognition System To Aid Deaf-Dumb People Using PCA,"2016 International Journal Of Computer Science & Engineering Technology (IJCSET).

[4] Shraddha R Ghorpade And Surendra K Waghamare," Full Duplex Communication System For Deaf & Dumb People," International Journal Of Emerging Technology And Advanced Engineering. [5] Ms.Shubhangi, G.Shinde, Prof.Rajashri, R.Itkarkar,

[5] Dr.Anilkumar, V.Nandi," Gesture To Speech Conversion For Sign Language Recognition,"International Journal Of Innovations & Advancement In Computer Science (IJIACS)ISSN 2347 – 8616 Volume 6, Issue 9 September 2017.

[6] S.Mitra And T. Acharya, "Gesture Recognition: A Survey," IEEE Trans.Syst., Man, Cybern. C, Appl. Rev., Vol. 37,Pp. 311–324, 2007.

[7] V.Padmanabhan, M.Sornalatha," Hand Gesture Recognition And Voice Conversion System For Dumb People," International Journal Of Scientific & Engineering, Research, Volume 5, Issue 5, May-2014 427 ISSN 2229-5518.

[8] Nasser H. Dardas And Emil M. Petriu'' Hand Gesture Detection And Recognition Using Principal Component Analysis" International Conference On Computational Intelligence For Measurement System And Application (CIMSA), Pp:1-6, IEEE,2011

[9] Ahmed, S.F.; Ali, S.M.B.; Qureshi, S.S.M., "Electronic Speaking Glove For Speechless Patients, A Tongue To A Dumb," Sustainable Utilization And Development In Engineering And Technology, 2010 IEEE Conference On , Vol., No., Pp.56-60, 20-21 Nov. 2010.

[10] Qutaishat Munib , Moussa Habeeb, Bayan Takruri, Hiba Abed Al-Malik, "American Sign Language (ASL), Recognition Based On Hough Transform And Neural Networks", Expert Systems WithApplications 32 (2007) 24–37 2.