**Introduction**

**1.1 Sign Language**

The World Health Organization (WHO) estimated that, 250 milling people in the world are deaf as well as dumb **[1].** These people of group use symbolic language to communicate with other people. This symbolic language is call sign language. Sign Language is a build for communication used worldwide among hearing, hard of hearing, and deaf peoples. Sing language is not a unique language singed consistently in different country. Sing language is not recent improvement. There is proof that speaking through gestures has been around since the start of human development [20]. Different counties have their own sign language such as American Sign Language, French Sign Language, Indian Sign Language and Puerto Rican Sing Language to a name few. In below figure give information about different sign language used in western continental. Gesture based communication is dependent on region and has significant differences from other languages. It is very important to understand sing language when we communicate with deaf children or youngster and the families of those deaf individuals. Lack of understanding might be outcome in significant challenges with understanding this community and may result in issue of miscommunication.

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| --- | --- | --- |
| **North America** | **Central America** | **South America** |
| •American Sign Language  •Inuit Sign Language  •Quebec Sign Language  •Puerto Rican Sign Language | •Costa Rican Sign Language  •Guatemalan Sign Language  •Honduras Sign Language  •Mayan Sign Language  •Mexican Sign Language  •Nicaraguan Sign Language  •Panamanian Sign Language  •Salvadorian Sign Language  •Tijuana Sign Language | •Argentine Sign Language  •Bolivian Sign Language  •Brazilian Sign Language  •Chilean Sign Language  •Colombian Sign Language  •Ecaudorian Sign Language  •Paraguayan Sign Language  •Peruvian Sign Language  •Uruaguayan Sign Language  •Venezuelan Sign Language |

Figure 1: Sign Language in the Americas[20]

Sign Language is a language which uses to convey message by hand movements, facial expression and body language to communication. It is mainly used by deaf and people who can hear but cannot speak. Sometime family member and relatives must learn sign language to interpreters which enable deaf and wider communities to communicate with each other.

**1.2 Mythologies and Misunderstandings about Sign Language**

The Sing language is enclosed by many mythologies and misunderstanding. Most people who are not disable think that sing language is just simple a manual representation of the spoken language which is not true. In fact, our language and sign language of the deaf have little in common. Sing language has the difficulty of the verbal language but it is self-determining from the alphabets. The best example is British Sign Language and American Sign Language which are meaningless although the facts that disable people from United States and Britain perfectly understand each other.

Another common misunderstanding about sing language is that it globally understandable which is of course not true. As explained above, the sing language that is used by the deaf in Unites States and Britain are very not the same. The different sign language might be similar within some alphabets but a deaf person from one country to other deaf person cannot communicate as fluently as hearing people from the two countries.

Since sign language is a language of its distinct language, finger spelling or the use of guidebook alphabet cannot be used as an alternative to signing. It is utilized in marking however just for words with a non-existent sign or when the sign isn't known. In addition, Deaf person would take hours to convey a few minute messages through finger spelling.

**1.3 Objective:**

My thesis main objective to help deaf community to increases their self-esteem and IQ level and improve their communication skill. Student who are deaf or have a deaf parent or have a close relative with deaf individual will learn by themselves about sign language alphabets and numbers. Deaf community will learn their first step toward to American sign language. Although correct usage of sign gesture plays very important part in effective communication. Deaf student also encouraged to establish connection to deaf community and to carry their new knowledge and skill beyond the class room and into the community at large. Some of very important objective are discussed in Chapter 3.

**1.4 Methodology**

In this thesis, both approaches have been combined, namely Image classification and machine learning for American sign language. For image classification I used computer vision algorithms to capture images and to process data set for filtering as well as reducing noise from images. Finally, Data set is trained using machine learning algorithm: conventional neural network for measuring accuracy of training data set, I have explained result of this algorithm in chapter 7. The most abstract view of derived approached the combined the image classification and machine learning for American sign language is shown in figure 1.

Feature Vector

Prepare Image

Feature Extraction

Neural Network

Feature Extraction

Edge Detection

Convert RGB to GRAY

Classification

Classified Image

**Figure 1: Project overview for American sign language**

**1.5 Outline:**