Human Computer Interaction Based on Gestures:

Topic: Interaction of Human with a computer using the gestures instead of Keyboard using state of the art Zero shot learning models.

Aim: The aim of the project is to study various new state of the art Zero Shot Learning methods such as Semantically Aligned Bias Reducing Zero Shot Learning and Quasi-Fully Supervised Learning and apply them in the area of hand gestures recognition for developing a system for deaf-mute person who use sign language to communicate and convert them to speech or text format in the form of speech or text format.

Abstract:

According to World Health Organization over 466 million suffer from hearing disabilities. And it is estimated that over 900 million people will be having hearing loss by 2050 . The means of message exchange between a Hearing impaired and person with ability of normal auditory systems has become an uphill battle over the years [1]. Mainly because small population having normal auditory system can understand sign language. There has been a lot of research done on gesture recognition, firstly by using a Kinect Sensor and by applying distance metric, Finger-Earth Mover's Distance (FEMD), to measure the dissimilarity between hand shape for the noise produced from the kinect sensor [2]. Moving further hand gesture recognition is achieved by segmenting the image and then applying a basic rule classifier on it [3]. In recent years a new method called Zero Shot Learning methods emerged and then the hand gesture recognition was done based on it [4]. Zero Shot learning methods recognizes an object from a given image that were not used during the time of training phase. But there are some disadvantages of using the Zero shot learning methods such as bias problem where the unseen object tend to be classified as the object from the seen classes while training [5]. This issue is covered by various methods such as Quasi-Fully Supervised Learning (QFSL)[5] and Semantically Aligned Bias Reducing Zero Shot Learning[6]. In this project we can work on the hand gesture or sign recognition using this new techniques on image and video and analyse which is better for the gesture recognition that can be further used in the systems for translating sign language into speech or text and also in the area of input devices to replace devices such as keyboard and mouse.

References:

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