LITERATURE SURVEY ON REAL-TIME COMMUNICATION SYSTEM POWERED BY AI FOR SPECIALLY ABLED

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S.No	Authors	Approach	Description	Pros	Cons
1.	D. Deora and N. Bajaj	Following steps are used to find finger tips. Step 1: Thinning using Distance Transform Step 2: Finding perimeter pixels of the image Step 3: Finding Corner points Step 4: Eliminating Corner Points Clustering Algorithm i. Calculating distance of each point from every other point and put these distances into a matrix. If all the cells have zero value but still we have points, it means there is only one cluster i.e. only one finger tip is there. There are some areas in the image that are still satisfying the criteria for the finger tip which are not correct. To fix this problem we have proposed an algorithm. For this we find the orientation of the binary image. Using the orientation and the centroid of	Principal Component Analysis is one of the most popular tools for high dimensional data analysis where dimensional reduction is necessary to reduce the number of input variables in order to simplify the problems. Commonly, in PCA, one tries to find out a set of projections that maximize the variance of give data, or equivalently, that minimize the residuals of the projections. PCA is obtained by calculating the Eigen vectors of the covariance matrix of the current frame; the Eigen vectors are stored according to their corresponding Eigen values in decreasing order called as the feature vector	The development of a natural input device for creating sign language documents would make such documents more readable for deaf people. Moreover hearing people have difficulties in learning sign language and likewise the majority of those people who were born deaf or who became deaf early in life, have only a limited vocabulary of accordant spoken language of the community in which they live. Hence a system of translating sign language to spoken language would be of great help for deaf as well as for hearing people. A second aspect is that sign language recognition serves as a good basis for the development of gestural human-machine	Unlike other sign languages (American Sign Language, German Sign language) Indian Sign language uses both hands to make signs. Some signs involve overlapping of both the hands. This overlapping of hands poses difficulty in segmentation and recognition which is explained in steps later. Recognition for static signs is easy to implement but some signs involve motion in them due to which their recognition becomes more difficult. For example – signs h, j, v, and y have motion in them.

		the hand, a line is drawn, which passes through this centroid at an angle that is given by orientation.		interfaces	
2.	Stephan Liwicki and Mark Everingham	They investigated the problem of recognizing words from video, finger spelled using the British Sign Language (BSL) finger spelling alphabet. This is a challenging task since the BSL alphabet involves both hands occluding each other, and contains signs which are ambiguous from the observer's viewpoint. The main contributions of our work include: (i) recognition based on hand shape alone, not requiring motion cues; (ii) robust visual features for hand shape recognition; (iii) scalability to large lexicon recognition with no re-training. We report results on a data-set of 1,000 low quality web cam videos of 100 words. The proposed method achieves	They approach to tackle these challenges in the following way: (i) we avoid attempts to explicitly track the individual hands, extracting a single appearance descriptor for the pair of hands; (ii) the method bases recognition on single image features alone. This prevents the classifier exploiting co-articulation features which vary across letter pairs, and means that we require only a small training set; (iii) variation in hand pose is overcome by the use of robust descriptors invariant to local deformation, and by training on short continuously signed sequences; (iv) implicitly ambiguous signs are disambiguate by using a lexicon of words, while not requiring re-training to expand the lexicon.	They have demonstrated that combining a state-of-the-art appearance descriptor with a simple HMM-based lexicon model can give highly accurate finger-spelling recognition on a large lexicon. The proposed method has an advantage over previous work in not requiring word-level training, making it scalable, and we showed that pan grams are a useful source of natural training signs. In improving the method, our results suggest that work should focus on letter-level recognition rather than prior language models. It seems promising to investigate extracting cues from multiple frames full gesture modeling which compromises	Limitations of their work are that our data set currently contains only a single inexperienced signer, and that the imaging conditions are only moderately challenging, com pared to . They hope that expanding the training data with other signers will remove the need for signer-specific training, and aim to investigate "front end" methods robust enough to deal with arbitrary and dynamic imaging conditions.

		a word recognition accuracy of 98.9%.		scalability	
3.	Dewinta Aryanie, Yaya Heryadi	Finger-spelling is a term refers to a finger gesture system where each alphabet of a particular sign language is represented by a unique and discrete finger pose. Fingerspelling is a very interesting research problem in computer vision with many potential applications in various domains. In sign language, for example, finger-spelling is used to explain a concept which lack of a specific sign, proper nouns, signs borrowed from other languages, finger spelled compounds, and a sign is ambiguous. Therefore, finger spelling is a complementary rather than substitute of sign language to enhance or emphasize the qualities of hand signs. The main contribution of this research is	User's hand is captured using a Microsoft Kinect sensor, which is a motion sensing input devices produced by Microsoft designed for Xbox 360 and Xbox One video game consoles and Windows PCs. Although, Kinect sensor produces two types of images namely color and depth images, for computation simplicity, only color images provided by the Kinect are used as training dataset. In order to address the curse of dimensionality, Principal Component Analysis (PCA) is applied to reduce data dimensions by converting a set of extracted feature into a set of values of linearly uncorrelated variables called principal components (PC) using an orthogonal transformation. The principal components are then selected based on its Eigenvalues that reflect its contribution to explain variability of the original dataset. In this research, the Eigenvectors that are	This study finds that performance of k-NN classifier is better for finger-spelling recognition when finger pattern is represented using full dimensional feature rather than using reduced-dimensional feature. Reducing feature dimension to only principal components that explain 98% of data variation decreases the k-NN performance significantly. Normalized color histogram is appropriate to represent finger pattern. However, this feature is sensitive to lighting. Therefore, performance investigation of other features involving texture and salient points will be the focus of future research.	The limitation of the k-NN classifier is its computation workload for recognition especially when the training dataset size is large. On the other hand, in order to implement this method into many potential applications of intelligent mobile electronic devices, efficient classifier for training and recognition dance gestures is very crucial. Therefore, performance investigation of other machine learning classifiers will become the focus of future research. It is also recommende d that the result of this

		mainly classifier for recognition finger-spelling which can be applied in early child education-based application such as self-assessment of special need student who learn sign language alphabet. In such application, accuracy of finger-spelling recognition is often more important than speed of recognition. The finger-spelling recognition system in this research can be characterized as follows: (1) Finger pose feature is a vector of normalized color histogram, and (2) Finger-spelling recognizer is k-Nearest Neighbors	kept are those that explain 98 % of the total variance. Therefore, the number of principal components is less than or equal to the number of original dimension.		study is validated using variety and larger number of finger spelling examples and variety of image features.

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