

Myanmar Sign Language Recognition using Image-based Hand Gesture Recognition

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- A sign language is a visual language which uses gestures instead of sound to convey messages, emotions, feelings, etc. by combining hand-shapes, orientation and movement of the hands among deaf-mute people or normal people.
- Hand gesture is the most commonly used tools for hearing and speech impaired people because the importance of body language cannot be more obvious for them.
- Sign language is one of the media of communication for deaf people and consists of three major components:
 - **fingerspelling**: which means for each letter of alphabet there is a corresponding sign.
 - **word level sign vocabulary**: which means for each word of the vocabulary there is a corresponding associated sign.
 - **non-manual features**: facial expressions and tongue, mouth and body position.

- Sign language is still needed to communicate between deaf-mute people and normal people from accessing education, job, it's because the majority of normal people can't understand their language.
- There are many different sign languages around the world and different nations use different hand sign languages.
- Sign language recognition can also be divided into two categories, namely; **static gesture recognition**, which focus on fingerspelling and **dynamic gesture recognition**, which related to isolated words and continuous sentence recognition.
- There is still needed sign language recognition for hearing impaired people in Myanmar.
- The project aims to support the children of **School for the Deaf Mandalay**, Myanmar.



Myanmar Sign Language Recognition using Image-based Hand Gesture

- The framework for Myanmar sign language recognition using hand gesture is proposed.
- Hand gesture recognition has many challenges in the environment of indoor and outdoor and in the condition of lighting changes.
- The objective is to accurately detect and recognize hand gestures for Myanmar alphabet sign language in complex backgrounds with different lighting conditions in order to support real time sign language recognition.



Myanmar Sign Language Recognition using Image-based Hand Gesture (Cont'd)

- The system focuses on static gesture recognition for Myanmar alphabet signs by using hand gesture to accomplish the interpretation of 31 static Myanmar alphabet sign gestures into Myanmar alphabet text.

Myanmar Sign Language Recognition using Image-based Hand Gesture (Cont'd)

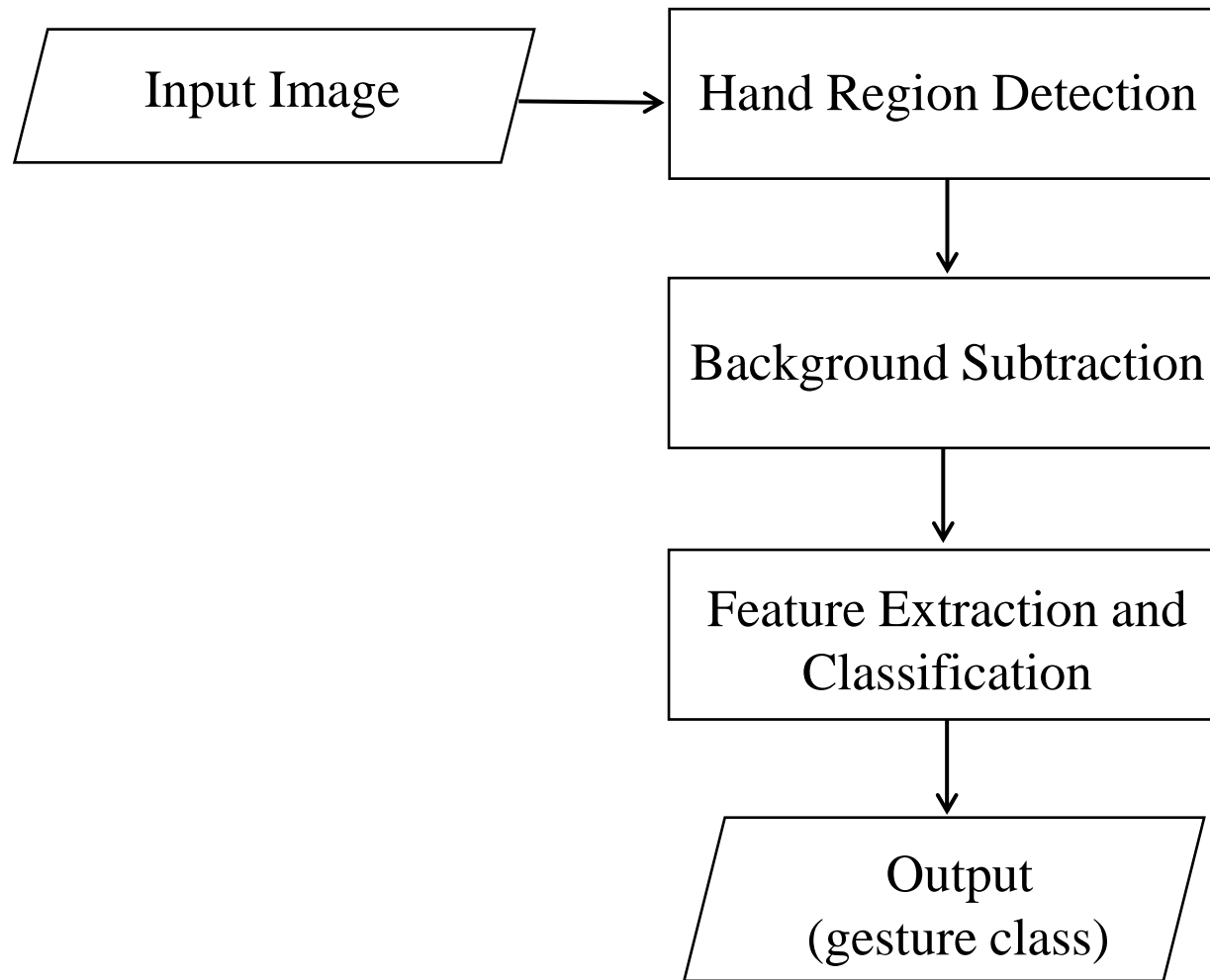


Figure: Architecture of the proposed system

Myanmar Sign Language Recognition using Image-based Hand Gesture (Cont'd)

- The most important thing in sign language recognition is accurate hand gesture detection from different background and different illumination conditions.
- The system detects the hand from the upper part of the human body from video sequences with different background, and the segmented region containing the hand gesture is fed to a Convolutional Neural Network (CNN) to accurately recognize Myanmar alphabet sign.

Myanmar Sign Language Recognition using Image-based Hand Gesture (Cont'd)

- Convolutional Neural Network is applied to learn and recognize hand gestures containing ROI for Myanmar alphabet.
- CNN learns human gesture itself and there is no need of specific feature extraction step.
- The system learns to do feature extraction and the core concept of CNN is, it uses convolution of image and filters to generate invariant features which are passed on to the next layer.
- The features in next layer are convoluted with different filters to generate more invariant and abstract features and the process continues till one gets final feature / output which is invariant to occlusions.

- The system is aimed to correctly detect and segment the region of hand gesture in the input video.
- Because of Myanmar Alphabet Sign Datasets are not publicly available, the own dataset is created for the project. The input videos are captured at different viewpoints from School for the Deaf, Mandalay, Myanmar.
- The system extracts and learns features of the segmented hand region to correctly classify the Myanmar alphabet.
- It is efficient and effective to recognize the hand gestures in different environments with higher recognition rates.

Impact (Cont'd)

- The proposed system enables to recognize hand gestures under some of the challenging conditions such as variation in scale, rotation and translation due to finger movement and color variations due to lighting conditions.

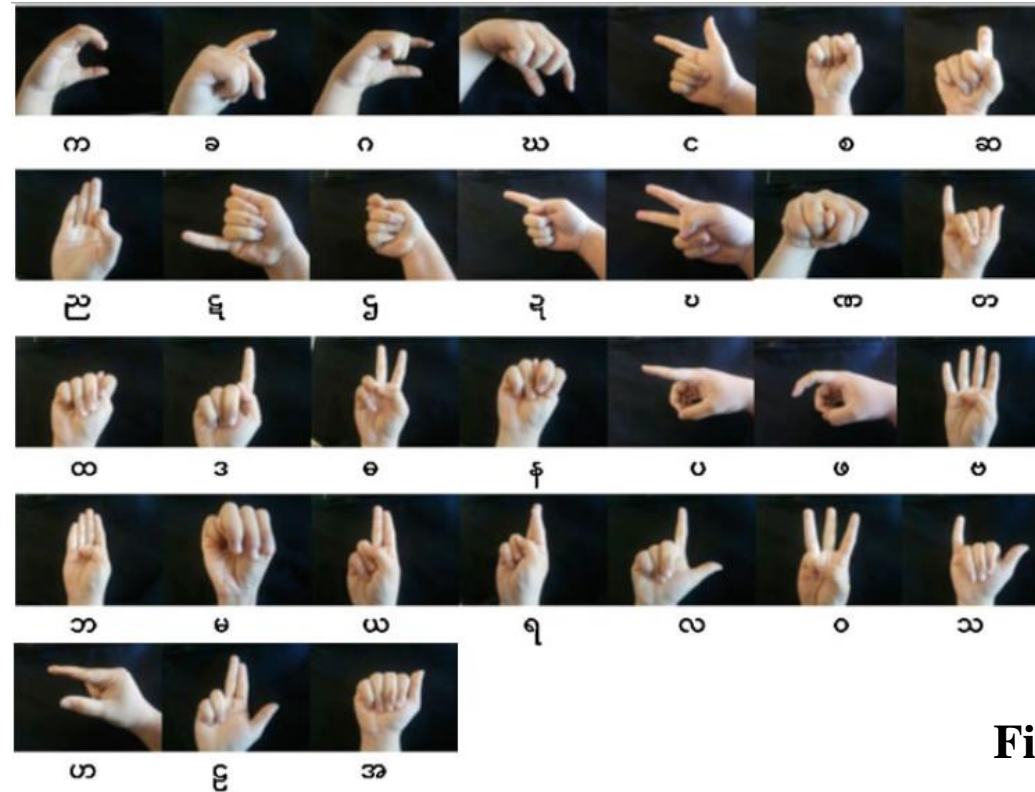


Figure: Myanmar alphabet signs

- Recognition of sign language by using hand gestures is one of the classical problems in computer vision.
- The proposed work addresses and solves the problems such as different illumination conditions and different background.
- Hand Gesture Recognition for Myanmar Alphabet in sign language is helpful to facilitate in bridging the communication gap using hand gesture among hearing and speech impaired people in Myanmar.

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Thank You for your attention