INDIAN SIGN LANGUAGE RECOGNITION SYSTEM USING OPENPOSE

By

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ABSTRACT

Human beings communicate through language, be it verbal or be it a sign language that makes use of body motion. Hearing and Speech impaired people, having no way to communicate verbally, make use of Sign Language. They perform gestures using a sign language in order to convey their message and effectively communicate with each other. Since, not everyone knows about Indian Sign Language (ISL), it becomes difficult for normal people to fluently communicate with Hearing and Speech impaired community. This paper proposes ISL gesture recognition system in order to decrease this communication gap. The dataset consists of videos of ISL gestures, which are performed by different Subjects. The proposed system uses OpenPose library, which helps in creating the skeleton of human body and thus it provides keypoints of the whole human body frame by frame. The use of this library removes the dependency on lighting conditions and background. It helps in focusing on just the gesture movements. After extracting the keypoints, Long Short Term Memory (LSTM) is used for classification of gestures. LSTM model classifies which ISL gesture the particular video belongs to.

Keywords: Indian Sign Language (ISL), OpenPose, Keypoints, Skeleton, Long Short Term Memory (LSTM).

INTRODUCTION

This paper is aimed at developing an Indian Sign Language recognition system through OpenPose (2019). The main objective of the System is to recognize commonly used ISL hand gestures. Humans require language to communicate with each other and the languages that we use is speech based. But the people who are hearing impaired or mute, cannot use such languages. Hence, they are dependent on Sign language for their communication for expressing their feelings. Like other languages, sign language is also considered as a Natural Language. This paper presents an idea to facilitate communication between the hearing disabled or mute people and the people who are not well versed with the sign language.

The existing systems use some specialized hardware sensors, glove, or IR Based optical markers. These hardware devices are at the moment expensive and unmanageable. Now-a-days, everyone has handheld devices like Mobile phones, Tablets, Laptops, etc., and these devices have become the communicational medium between people. Hence a system that can make use of these devices to recognise the signs is more convenient than having a specialised hardware around.

1. Literature Survey

1.1 A Framework for Human-Computer Interaction using Dynamic Time Warping and Neural Network

The idea which was based on Dynamic Time Warping (DTW) for conveying the messages and software based approach for receiving messages using Microsoft Kinect