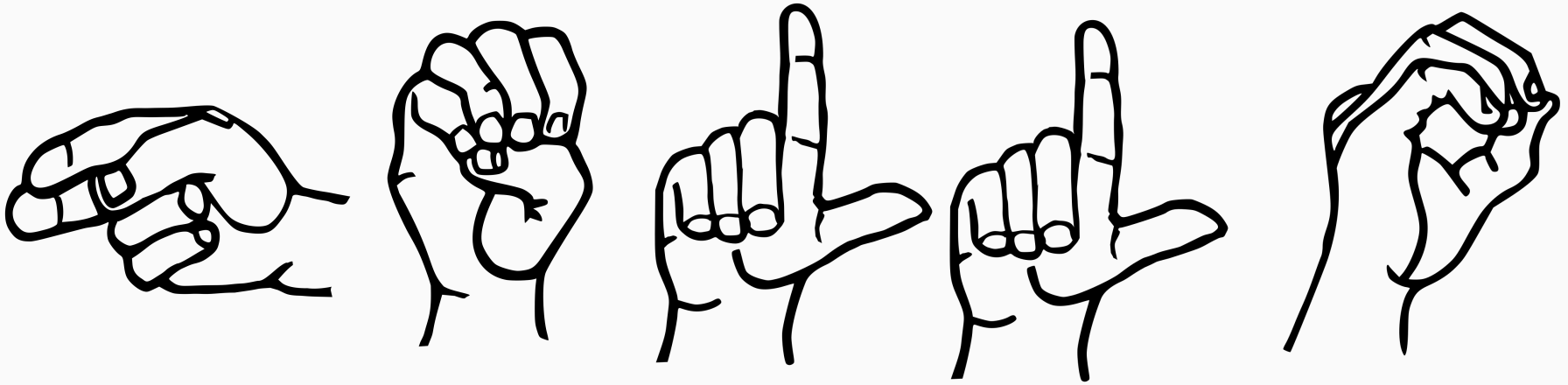

H E L L O

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Sign Language Interpreter

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ABSTRACT

Speech Impairment is a disability, which affects an individual's ability to communicate using speech and hearing. This brings about the difficulty for both the sign and non - sign language speakers to communicate with each other. With recent advances in deep learning and computer vision, the focus of our project is to create a vision of an end to end Convolutional Neural Network that will be trained on the ASL(American Sign Language) dataset then modeled on robust architectures like GoogLeNet/MobileNet architecture and deploy it on an android application so that it will have more accessibility and provides an ease of use, thus aiding communication between signers and non-signers.It is a challenging and interesting problem that if solved will bring a leap in social and technological aspects alike.

PROBLEM STATEMENT

- Sign Language is a virtual gestural language (words expressed in air) which is used to communicate with people having impairments and speech

- From the systematic analysis, difficulty is faced by deaf community towards access to health care leading to linguistic barrier.

- Without prior knowledge, it is difficult for the non - signers to understand the signs and communicate effectively.

Conclusion

- A sign language is a natural mode of communication used by the deaf community. India has large population of speech and hearing impaired but a very small number of certified sign language interpreters are available.
- Research in hand gesture recognition has gained attention with advancement in the field of computer vision.
- A Sign Language Interpreter (SLI) decodes and understands the information conveyed by signs.
- SLI can be a major breakthrough in helping a common people to communicate with the deaf and can help in bridging this communication gap.
- A SLI can be designed based on image processing and deep learning techniques which requires a standard dataset, determination of an optimal feature set, and an appropriate classification technique.

Automated Hand Gesture Recognition using a Deep Convolutional Neural Network model

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***Abstract*—The tremendous growth in the domain of deep learning has helped in achieving breakthroughs in computer vision applications especially after convolutional neural networks coming into the picture. The unique architecture of CNNs allows it to extract relevant information from the input images without any hand-tuning. Today, with such powerful models we have quite a flexibility build technology that may ameliorate human life. One such technique can be used for detecting and understanding various human gestures as it would make the human-machine communication effective. This could make the conventional input devices like touchscreens, mouse pad, and keyboards redundant. Also, it is considered as a highly secure tech compared to other devices. In this paper, hand gesture technology along with Convolutional Neural Networks has been discovered followed by the construction of a deep convolutional neural network to build a hand gesture recognition application.**

***Keywords*—Convolutional Neural Networks, Hand Gesture Recognition system, Feature Map, Deep neural network**

I. INTRODUCTION

A gesture is a body movement that conveys a noteworthy implication. Gesture recognition is a computer science technology that helps a user in interacting with their digital devices using simple and natural body gestures. Gesture recognition technology can be beneficial at many places like automated home appliances, hand signal interpretation [1], automobiles, etc. Hand gesture recognition is a part of gesture recognition that is based on recognizing the movements of hands meant to be delivered, for example: showing a forefinger could denote the number "1" or a thumbs up could be an indication of agreement.

Deep learning is a fragment of a wide-ranging family of Artificial Intelligence. It essentially puts a light on the concept of a multi-layer perceptron learning. A Convolutional Neural Network commonly known as a Comp Net is a neural network class used in deep learning which is most applied to images and videos for their analysis. A CNN is a technique, or a machine learning model that can be applied to images to make them interpretable by machines. It can be implemented in other data analysis and classification problems as well. It is a type of artificial neural network which has a specialty of being able to deduce or distinguish patterns and understanding them. It is different than other deep learning models as it has an extra set of hidden layers called the convolutional layers along with the standard hidden layers. It can have one or more than one convolutional layer followed by the fully connected layers. The system will be learning features from each gesture and then further classify it. The entire notion of making a machine learn and making it smart is based on the abundance of data or information.

Our data fuels the machines and is used to make the machine learn to make predictions. The main aim of this paper is to train an algorithm which enables it to classify images of various hand gestures and signs like thumbs up, bolted fist, finger count, etc. Since the analysis of visual imaginings is being used, the class used to perform deep learning will be Convolutional Neural Network with Keras and TensorFlow as it is the standardized version of a multilayer perceptron.

This research provides the reader with a profound knowledge of a deep convolutional neural network. Also, this paper uses the data captured using the OpenCV library which will contribute to improving the accuracy score of the existing hand gesture recognition techniques.

In this research, a real-time anti-encroaching hand gesture recognition and hand tracking mechanism has been proposed which will improve the human-computer interactions and bring ease for the ones who rely on gestures for their day-to- day communication. It can be a significant communication tool for deafened people and people with ASD or autism spectrum disorder. It can be of great assistance for SOS signaling.

II. LITERATURE REVIEW

A technique of hand gesture recognition on a video game-based application has been proposed in [1].

Base Paper

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Many thanks.