

CMR TECHNICAL CAMPUS

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Department of Electronics & Communication Engineering
Real Time Project Review

SIGN LANGUAGE RECOGNITION



BATCH NO : 16

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ABSTRACT

- Deaf is the inability to hear and dumb is the inability to speak. They communicate using sign language among themselves and with normal people but normal people do not take seriously the importance of sign language. Not everyone possesses the knowledge and understanding of sign language which makes communication difficult between a normal person and a deaf and dumb person. To overcome this barrier, one can build a model based on machine learning. A model can be trained to recognize different gestures of sign language and translate them into English. This will help a lot of people in communicating and conversing with deaf and dumb people.

INTRODUCTION

- Communication can be defined as the act of transferring information from one place, person, or group to another. It consists of three components: the speaker, the message that is being communicated, and the listener. It can be considered successful only when whatever message the speaker is trying to convey is received and understood by the listener. It can be divided into different categories as follows [1]: formal and informal communication, oral (face-to-face and distance) and written communication, non-verbal, grapevine, feedback, and visual communication, and the active listening.

LITERATURE SURVEY

Author	Publication	Year	Problem	Methodology	Remark
Salem Ameen, Sunil Vadera	University of Salford	2017	Classify American Sign Language Fingerspelling from Depth and Colour Images	CNN	This paper explores the applicability of deep learning for interpreting sign language, precision of 82% and recall of 80%.
Arabic sign language recognition with 3D convolutional neural networks	IEEE	2017	3D Convolutional Neural Network (CNN) was used to recognize 25 gestures from an Arabic sign language dictionary	CNN	The system achieved 98% accuracy for observed data and 85% average accuracy for new data.

PROPOSED METHODOLOGY

- Following the data acquisition, a labeled map is created which is a representation of all the objects within the model, i.e., it contains the label of each sign (alphabet) along with their id.
- The label map contains 26 labels, each one representing an alphabet. Each label has been assigned a unique id ranging from 1 to 26.
- This will be used as a reference to look up the class name. TF records of the training data and the testing data are then created using `generate_tfrecord` which is used to train the TensorFlow object detection API. TF record is the binary storage format of TensorFlow.

IMPLEMENTATION & ARCHITECTURE

- **IMAGE CAPTURE:** Using a webcam with Python and OpenCV.
- **PROCEDURE:**
 - **Definition:** A label map is a representation of all objects within the model.
 - **Content:** 26 labels, each representing an alphabet.
 - **ID Assignment:** Each label assigned a unique ID ranging from 1 to 26.
 - **Usage:** Helps in referencing class names during model training and detection.
- **TECHNIQUE:** Capture multiple images of each sign to ensure robust training data, and visualize the result.

RESULTS & DISCUSSION



A	B	C	D	E	F	G	H	I
94%	98%	90%	90%	70%	96%	73%	97%	95%
J	K	L	M	N	O	P	Q	R
57%	87%	93%	91%	55%	78%	95%	95%	83%
S	T	U	V	W	X	Y	Z	
86%	81%	87%	86%	87%	88%	90%	80%	

CONFIDENCE RATE OF EACH ALPHABET

CONCLUSION AND FUTURE SCOPE

- Sign languages are kinds of visual languages that employ movements of hands, body, and facial expression as a means of communication. Sign languages are important for specially-abled people to have a means of communication. Through it, they can communicate and express and share their feelings with others. The drawback is that not everyone possesses the knowledge of sign languages which limits communication. This limitation can be overcome by the use of automated Sign Language Recognition systems which will be able to easily translate the sign language gestures into commonly spoken language

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THANK YOU