Human Sign language Detection

DISSERTATION

Submitted in partial fulfillment of the requirements of the

MTech Data Science and Engineering Degree programme

By

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2021sc04377

Under the supervision of

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DSECLZG628T **DISSERTATION**

Dissertation Title   :**Human Sign language Detection** _____

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Abstract

Interaction with Deaf & mute people communicate with others using the sign language. Lack of knowledge in sign language has resulted in the communication gap. Getting proficiency in the sign language is difficult task unless its dedicated effort. Another challenge is there are lot of localized sign language used by the people based upon the region where they live.

The Advancement of AI technology can bridge the communication gap which can lead to higher social interaction. In real time sign-language can be detected and can be used for social communication.

The scope of this project is to design and implement the basic sign language detection using images first and then enhance the project to include real time detection. The future scope of the update of this project to enhance the communication through advancement in technology will also be determined.

The plan is to use python programming , Open CV , Deep learning technique like Convolution neural network (CNN) model , YOLO to cater the real time detection for deaf and nonverbal people.
The challenge would be training the model with the dataset of the sign language and preventing the over-fitting of the training data.

 Key Words:
 CNN, Deep Learning, YOLO, OpenCV, Sign Language

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Topic of Dissertation: Human Sign language Detection

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<u>**Name of First Examiner:**</u> _____

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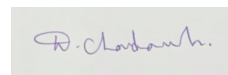<u>**Name of Second Examiner:**</u> _____

Designation of Second Examiner:_____

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(Signature of Student)   (Signature of Supervisor)

Date: 14 Dec 2023   Date:14 Dec 2023

Problem Statement:

Deaf and mute are having challenge task while communicating with outside world even in the world of digital advancement where there is lot of video interaction tools used for communication.

The knowledge of sign language is not common among the people which act as hindrance in the communication with Deaf and mute people.

Objective of the project:

The Objective of this project is to understand the human sign communication using the deep learning technologies like Convolution neural network, YOLO, Open CV.

By detecting the human sign and providing effective way of communication.

Benefit to the society: The benefit to the society is to have a AI model/tool that can provide the communication to the outside work that will enable higher interactive with deaf and mule people.

Scope of Work: The scope of the work is to start recognizing the human sign (hand sign) in the images and enhance this work to real time camera like web camera.

Resource needed for the project.

As we are using the models like YOLO, the RAM and GPU required would be minimum 12 GB along with multi core processor. This is for the small and medium size dataset.

Potential challenge & Risk during the project

Potential challenge would be real time processing of the Human sign language as there may different factor that may affect the model performance like Limited training dataset, Gestures Ambiguity, Noisy environment [varying lighting], Developing universal model.
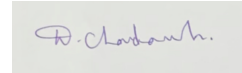
Detailed Plan of work:

#	Task	Expected date of completion	Names of Deliverables
1	Project planning	12/12/2023	
2	Project Design , Data preprocessing & preparation	15/01/2024	
3	Mid Sem Review	28/01/2024	
4	Model Development ,Training	20/02/2024	
5	Model Testing and Evaluation	05/03/2024	
6	Final Report	10/03/2024	

Supervisor's Rating of the Technical Quality of this Dissertation Outline

EXCELLENT / GOOD / FAIR/ POOR (Please specify):   EXCELLENT

Supervisor's suggestions and remarks about the outline (if applicable).

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