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Major Project Presentation

Guide : Mr. Rahul Kumar sharma

TITTLE : Vision quest: an approach to hand sign recognition system

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Hello!

We are Group - 31

We are here to present our Major Project.

1. Introduction

Let's take to you through what we have in mind and hope to create

Big concept

Machine Learning and Web Development
for a better and more inclusive future

Gesture Recognition System

Why ?

We aim for a future which includes everybody. Disabilities like Deafness , Blindness should not hinder an individuals growth

Also, with increasing speeds on computer processing conventional methrods of communicating with a machines are fading away. Hence a newer more advanced way is required

How ?

With tools like Machine Learning and Artificial Intelligence such a system is not a far-fetched dream

Mathematics and Artificial vision will be critical in creating a such a system without the use of any extra hardware.

2. Technologies USed

Tools and Tech. we will utilize to make is idea a Reality

Technologies used

VS CODE
A versatile and powerful source code editor

v

m

MACHINE LEARNING

Machine Learning Algo's are capable of understanding images

ARTIFICIAL INTELLIGENCE

AI cams can understand and differentiate between objects in an image

a

c

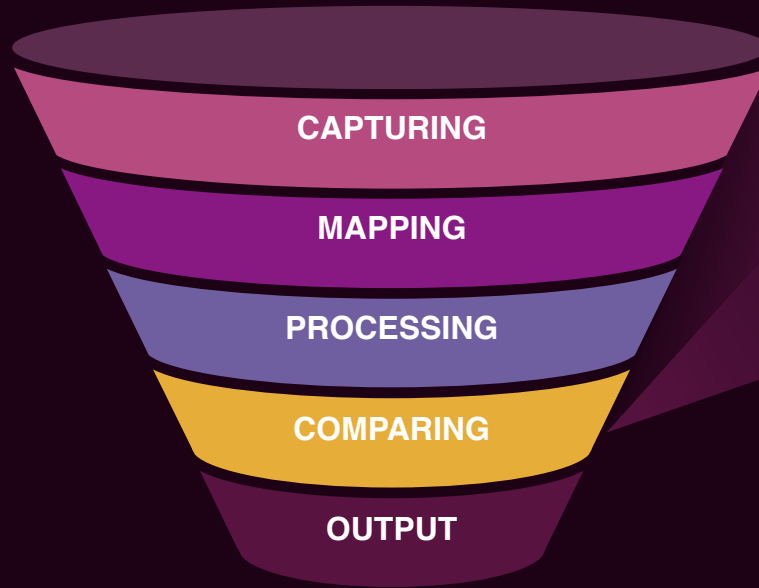**COMPUTER VISION** **M**achines interpreting visual data for real-world understanding**.**

3. SRS report

Tools and Tech. we will utilize to make is idea a Reality

software requiremnet specifications

Take in Continous Visual Inputs 1

2 **Process the images and extract information**

3 **Use ML Algorithms to understand what is daata denotes**

methodology

CAPTURING

MAPPING

PROCESSING

COMPARING

OUTPUT

4. TECHNICAL KEYPOINTS

Project kEYpoints

A total of 21 points will be mapped on the hand images taken. Each point will represent a joint on our palm

Cognitive Neural Networks will be the basis of the recongition System

MediaPipe Hand Landmark Model- 21 3D key points Detection is done via regression, that is direct coordinate prediction

5. Literature Review

A Summary of all the Research Papers we analysed
to better understand what we are hoping to create

Breaking Barriers: Sign Language
Translation Enhanced with MediaPipe
and Machine Learning

Author: Nikita sachdeva

This research is driven by the aspiration to break down communication barriers between sign language users and non-users. By integrating the robust features of MediaPipe and machine learning , the goal is to create an advanced sign language translation system. This system aims to translate sign language gestures effortlessly into spoken or written language, getting better communication and understanding.

Sign Language Recognition Based on Computer Vision

Authors: Wanbo Li , Hang Pu , Ruijuan Wang

The study of sign language involves the intersection of many fields and disciplines. At present, the two mainstream research directions of sign language recognition are data gloves and visual sign language recognition [2] . The former uses the data collected by the sensor for sign language recognition and translation, while the latter uses the camera to capture the user's hand characteristics for sign language recognition and translation. In this paper, an improved convolutional neural network (CNN) [3] and long short-term memory neural network combined sign language recognition system, which is different from the current only for sign language recognition and translation, but also for sign language generation function is designed. For the first time, this system uses a PyQt designed GUI interface. Once in the system, users can select sign language recognition and translation capabilities, capture images via OpenCV, and then use the trained CNN neural network for special processing. The model can then identify American sign language through LSTM decisions. The user can also click the voice button, the system will be based on the user's voice to convert the corresponding gesture image into the same pixels, and write to the video file. Experimental results

K-nearest correlated neighbor classification for Indian sign language gesture recognition using feature fusion

Authors: Bhumika Gupta , Pushkar Shukla , Ankush Mittal

A sign language recognition system is an attempt to bring the speech and the hearing impaired community closer to more regular and convenient forms of communication. Thus, this system requires to recognize the gestures from a sign language and convert them to a form easily understood by the hearing. The model that has been proposed in this paper recognizes static images of the signed alphabets in the Indian Sign Language. Unlike the alphabets in other sign languages like the American Sign Language and the Chinese Sign language, the ISL alphabet are both single-handed and double-handed. Hence, to make recognition easier the model first categorizes them as single-handed or double-handed. For both categories two kinds of features, namely HOG and SIFT, are extracted for a set of training images and are combined in a single matrix. After which, HOG and SIFT features for the input test image are combined with the HOG and SIFT feature matrices of the training set. Correlation is computed for these matrices and is fed to a K-Nearest Neighbor Classifier to obtain the resultant classification of the test image.

Approach to the Sign Language Gesture Recognition Framework Based on **HamNoSys** Analysis

Authors: Mikhail G. Grif , Alexey L. Prikhodko

Gesture recognition in sign language can be a useful tool for the study of sign language. The paper proposed the Sign Language gesture recognition framework based on analysis BamNoSys using data from program library OpenPose. Bam-N oSys - transcription system designed for detailed linguistic transcription of manual and non-manual gesture feature. In the framework, a sign word is considered to be a combination of five common sign components: trajectory, axis, hand shape, rotation and orientation, and sign language gesture classification is implemented based on linguistic analysis of BamN oSys. The result of this study will be valuable to carrying out educational or research activity related to the SL as well as related software providers in developing better practice and tools for applied linguistic research.

A real time alphabets sign language recognition system using hands tracking

Authors: Sulfayanti , Dewiani , Armin Lawi

Majority people can communicate through verbal language, but there are some people with limited abilities must use sign language with hand and finger movements to communicate even though not everyone is able to understand its meaning. The rapid development of information technology can assist in understanding and translating the gestures. This research aims to design and build a system gesture recognition of alphabet sign language that have the characteristic that fingers open by utilizing the Kinect camera. Recognition system built through two stages, i.e., the tracking process and the recognition process. Implementing the hands tracking method did the tracking process. The recognition process consists of two phases, i.e., the first process is to get input that will be used as reference data and data testers which is done by calculating the vectors and vector angle and, the second process is the gestures recognition process was done by calculating the Euclid distance. The system is able to recognize gestures alphabets of 69.79% of the average level of accuracy that is different in each as

Sign Language Recognition in Virtual Reality

A real-time system for signal language recognition in virtual reality (VR) is presented in this paper. The system makes use of an egocentric view with the Vive HTC VR headset along with a Leap Motion controller. In this demo, a random forest is used to classify the 26 letters of the alphabet, in American Sign Language, from hand-crafted features extracted from the Leap Motion controller. We detail offline classification results showing the expressive power of the features used for recognition.

Authors: Jacob Schioppo , Zachary Meyer , Diego Fabiano , Shaun Canavan

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>Muhammad Al-Qurishi , Thariq Khalid , Riad Souissi
>IEEE Access
>Year: 2021 | Volume: 9 | Journal Article | Publisher: IEEE

thanks!

Any questions?