Sign Language Recognition

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Team Information

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Project description

A Sign Language project that converts a video stream of sign language into text using Deep Learning
This model recognizes 5 classes which are:

- Like
- dislike
- Love
- Yes
- No

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Demo

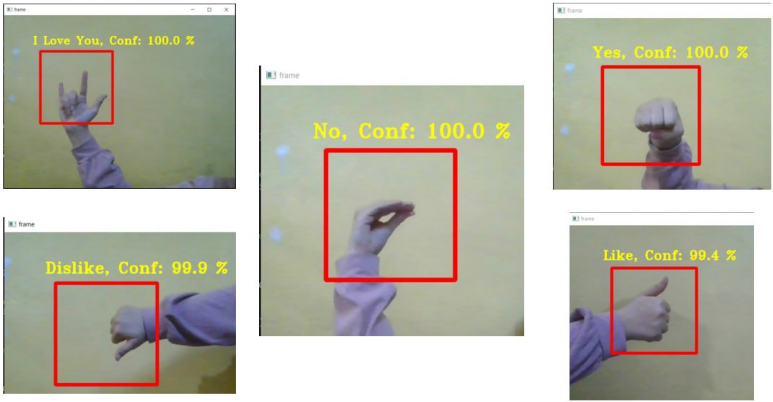

Fig.1. Demo

https://github.com/mariamadel200/Sign-Language-Recognition

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Contribution

- Found an ASL images dataset from Kaggle
- Got a model from Github
- Trained the model on the new dataset
- Edited the training to test data ratio [80%,20%]
- Edited the model to recognize 5 words instead of 25 alphabet
- changed the number of epochs
- Error Analysis:Dislike and Like Signs are not always classified correctly

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Data

We take five words from a datset from kaggle that was uploaded by **Belal Elwikel**
Each folder in the dataset represents a Sign ,each folder consists of 4000 images, each image is 200×200 pixels and all images are RGB from this link:
`https://www.kaggle.com/datasets/belalelwikel/asl-and-some-words`

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Project Architecture

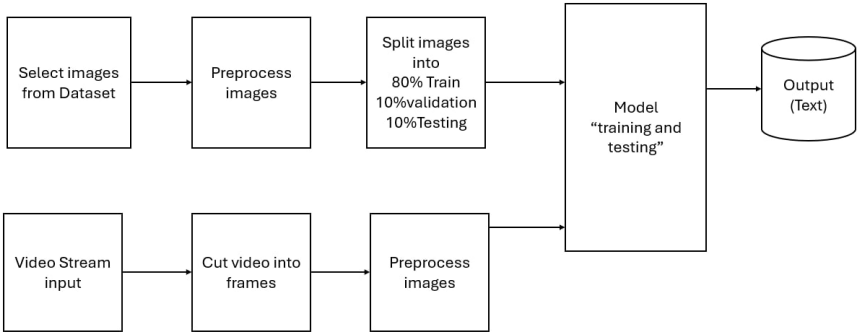

Fig.2.Project Architecture

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Methods

The model consists of the following layers:

Model: "sequential"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 48, 48, 16)	448
conv2d_1 (Conv2D)	(None, 46, 46, 16)	2,320
conv2d_2 (Conv2D)	(None, 44, 44, 16)	2,320
max_pooling2d (MaxPooling2D)	(None, 22, 22, 16)	0
conv2d_3 (Conv2D)	(None, 20, 20, 32)	4,640
conv2d_4 (Conv2D)	(None, 18, 18, 32)	9,248
conv2d_5 (Conv2D)	(None, 16, 16, 32)	9,248
max_pooling2d_1 (MaxPooling2D)	(None, 8, 8, 32)	0
conv2d_6 (Conv2D)	(None, 6, 6, 64)	18,496
conv2d_7 (Conv2D)	(None, 4, 4, 64)	36,928
conv2d_8 (Conv2D)	(None, 2, 2, 64)	36,928
flatten (Flatten)	(None, 256)	0
dense (Dense)	(None, 128)	32,896
dense_1 (Dense)	(None, 5)	645

Total params: 154,117 (602.02 KB)
Trainable params: 154,117 (602.02 KB)
Non-trainable params: 0 (0.00 B)

Fig.3. Model Layers

Methods

The Learning rate is : 0.001
The Optimizer used is : "adam"
The Loss Function used is : "categorical crossentropy"

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Results

We Show the results using 2 measures:**Accuracy and Loss**

```
#testing
model.evaluate(X_test, Y_test)
```

```
63/63 ━━━━━━━━━━━━━━━━━━━━ 1s 15ms/step - accuracy: 0.9968 - loss: 0.0094
[0.009163103066384792, 0.996999979019165]
```

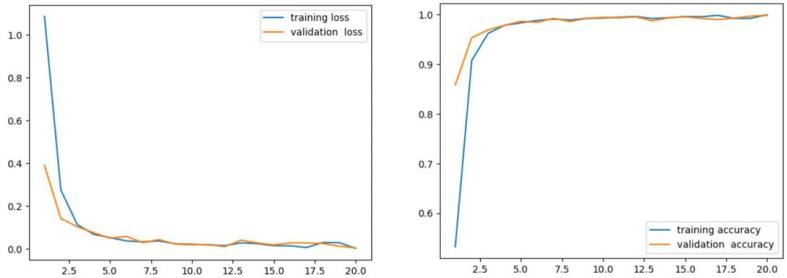

Fig.4. Results