



SIGN LANGUAGE

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Table of Containt

- . Introduction
- . Goals
- . Workflow
- . Tools
- . Data
- . Data Preprocess
- . Model
- . Test in Real Time
- . Challenges
- . Future Work



INTRODUCTION & Goals



Extract holistic
Keypoints



Train an LSTM



Real time sign
language detection

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Workflow

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Extract
Key-point

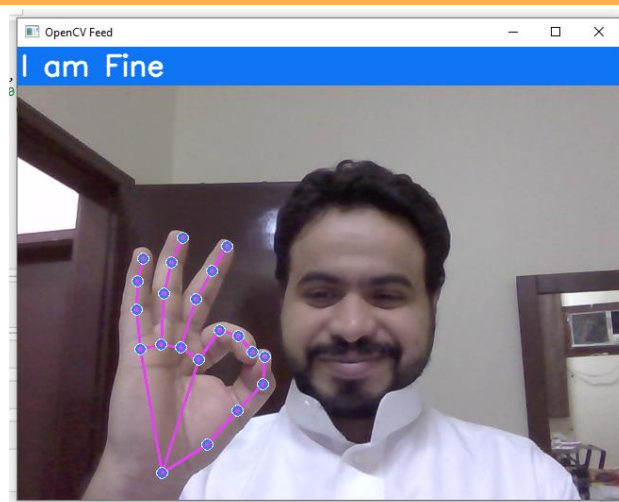
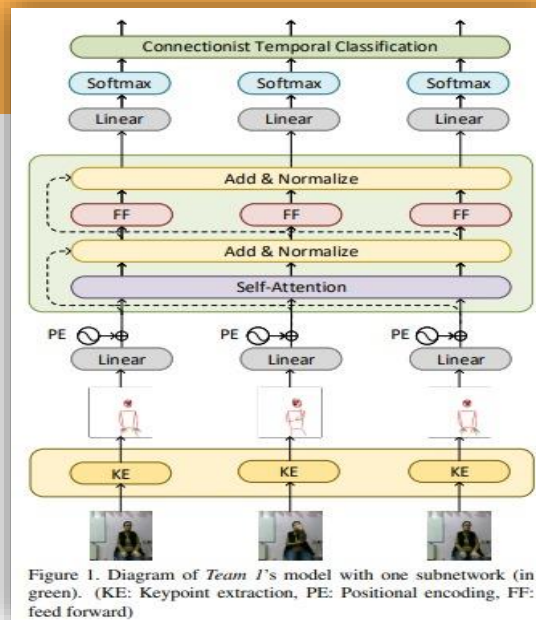
Train
Model

OpenCV

Step 1

Step 2

Step 3



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Tools

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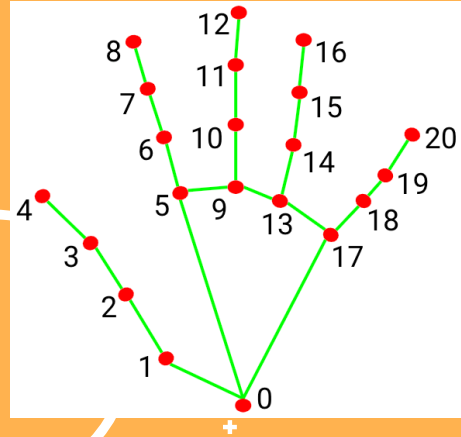




Data



we collected 30 video per action
then each one of those video
sequences are going to contain
30 frame of data each frame
will contain 126 landmark value



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>>>> Data Preprocess

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- Create Dictionary
- Store sequence inside a numpy array
- preformed training and testing partition

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```
x
array([[ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         0.00000000e+00,  0.00000000e+00,  0.00000000e+00],
       [ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         0.00000000e+00,  0.00000000e+00,  0.00000000e+00],
       [ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         0.00000000e+00,  0.00000000e+00,  0.00000000e+00],
       ...,
       [ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         1.92339197e-01,  4.50356334e-01, -5.86931072e-02],
       [ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         1.90044999e-01,  4.51489985e-01, -5.07294126e-02],
       [ 0.00000000e+00,  0.00000000e+00,  0.00000000e+00,  ...,
         1.86042190e-01,  4.51691985e-01, -5.15233129e-02]],
      dtype=float64)
```



>>>> Model



LSTM Model is trained using the extracted key-points and later used for real time predictions

we chose this model because Mediapipe Holistic with LSTM Model gives a much better accuracy.



LSTM

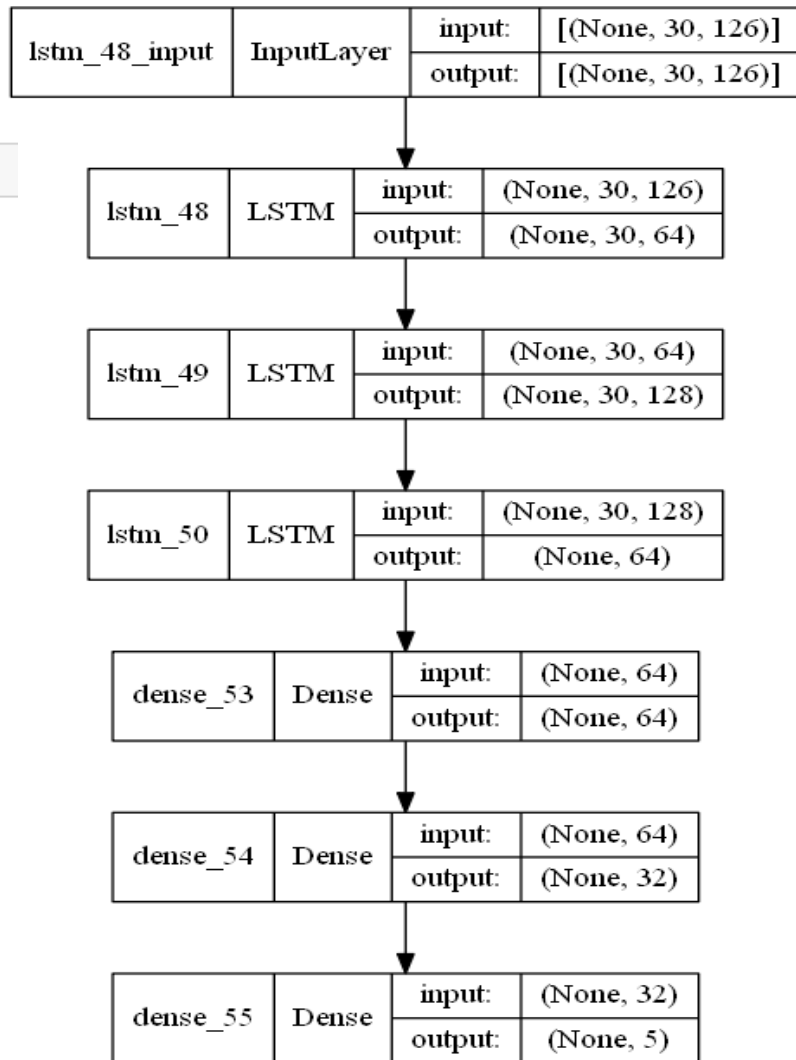
```
In [702]: model.summary()
```

Model: "sequential_34"

Layer (type)	Output Shape	Param #
=====		
lstm_48 (LSTM)	(None, 30, 64)	48896
lstm_49 (LSTM)	(None, 30, 128)	98816
lstm_50 (LSTM)	(None, 64)	49408
dense_53 (Dense)	(None, 64)	4160
dense_54 (Dense)	(None, 32)	2080
dense_55 (Dense)	(None, 5)	165
=====		
Total params: 203,525		
Trainable params: 203,525		
Non-trainable params: 0		
=====		

```
In [720]: accuracy_score(ytrue, yhat)
```

Out[720]: 1.0



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Test in Real Time



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Challenges

01

Dataset

02

libraries

03

Time

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Future Work



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Moor sign language

Voice

Arabic

Reverse



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