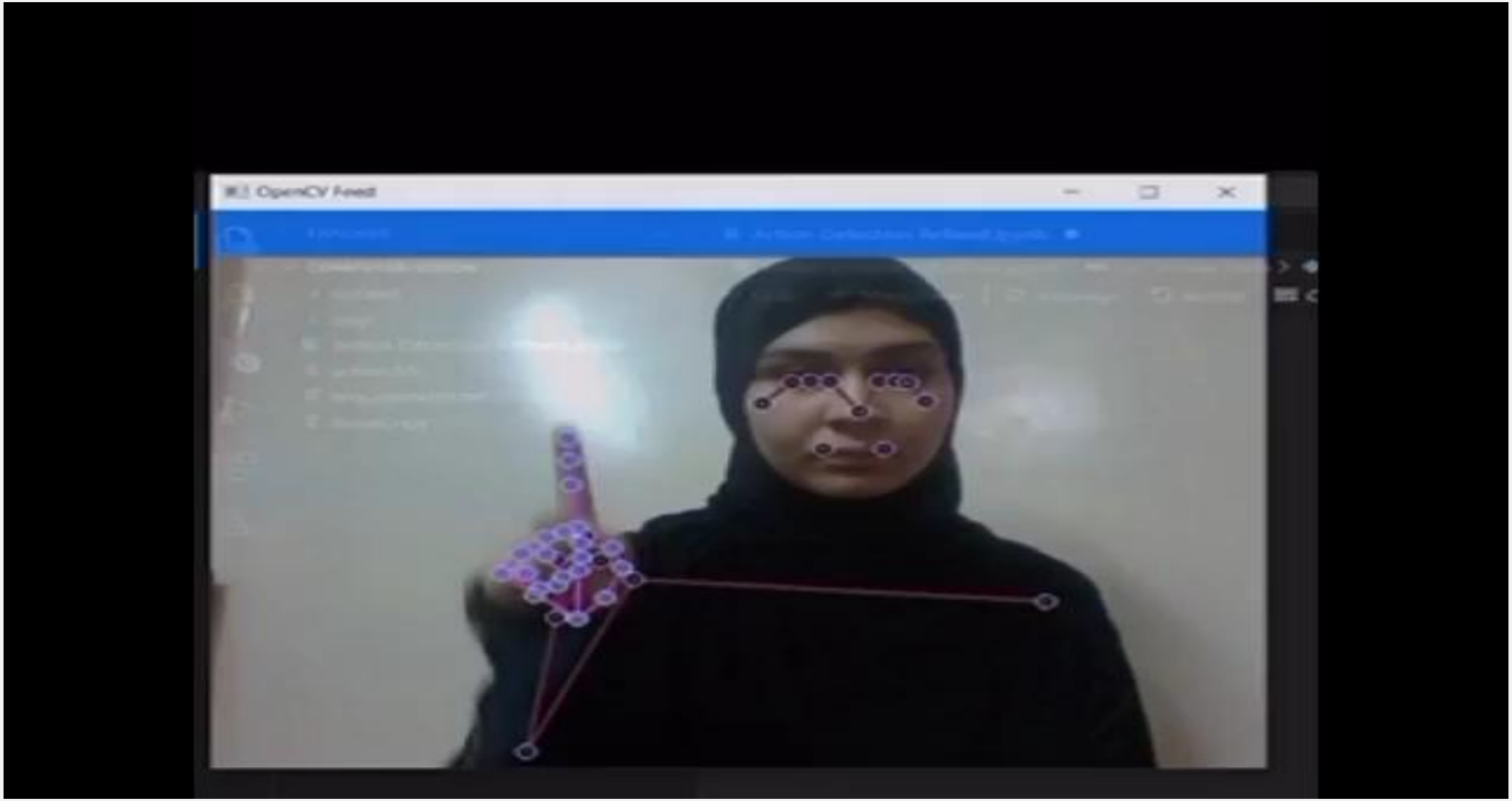
TEAM ID: 9

Yomna Mohamed Sayed	162021391
Wafaa Mostafa Kamel	162021384
Huda Mawood Kamal	162021378

SIGN LANGUAGE MODEL

The model detect three words :

(dislike , four , one)



https://github.com/Huda-Mawood/Sign-Language-Recognition

CONTRIBUTION

1.Initially, getting a model (https://github.com/nicknochnack/ActionDetectionforSignLanguage/tree/main)

2. Collecting dataset as video stream

3. After training The model, it yielded an accuracy of 40%.

4. Increasing number of epoch from 1000 to 5000

5. Increasing number of frames from 30 to 50

6.Training the model again, and the accuracy decreased to 30%.

CONTRIBUTION

7. Changing the dataset method from video stream to static dataset.

8. Changing the neural network from LSTM to GRU.

9. Reduce number of epoch to 1000.

10. After training The model achieved 76% accuracy however, the model was not detect well.

11. Mirrored the images during data preprocessing.

12. Training the model for the last time, the accuracy still 76%

DATASET

We used an already exist (RGB) dataset

1. Size :

1.1. The dataset is consisting of 9,000 images.

1.2. The dataset categorized into 3 gestures.

1.3. each gesture consists of 3,000 images, with the dimensions of each image is 384x512

2. Preprocessing :

2.1. we mirrored the images to ensure the model's ability to recognize gestures irrespective of handedness.

2.2. Labeling and Feature Extraction: - Extracting Information from File Names

- Loading Additional Data from Files

- Assigning Labels to Sequences

ARCHITECTURE

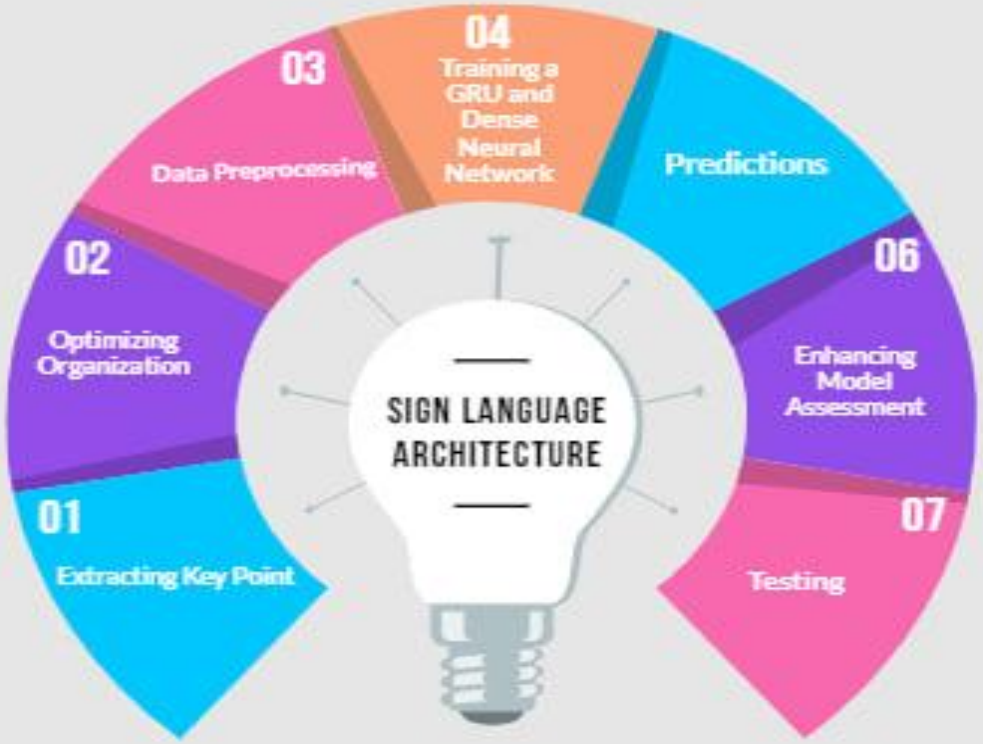


Figure 1:- Steps to Develop an Accurate Sign Language Detection Model

METHODS

- A combination of **GRU** (Gated Recurrent Unit) and **dense** layers is used to classify sequence data.
- **Number of layers** is 3 GRU layers and 4 Dense layers
- ***Layer Sizes:***

GRU Layer 1: 64 units

GRU Layer 2: 128 units

GRU Layer 3: 64 units

Dense Layer 1: 128 units

Dense Layer 2: 64 units

Dense Layer 3: 32 units

METHODS

- **Activation function**:

ReLU: is used to facilitates feature learning and gradient propagation within the neural network's hidden layers.

Softmax : is used to produces meaningful class probabilities at the output layer, aiding in accurate classification.

- ***dropout regularization*** *is implemented to enhance the generalization capabilities of neural network architectures and prevent overfitting to the training data.*

- ***Adam*** *Optimization Algorithm is implemented.*

- ***Number of epochs*** *: 1000*

RESULT

Accuracy was used as a measure.

The accuracy yields **76%**