Team information

➢ Team Id: 45

➢ Names :
   1. Ebitsam Sayed Mahfouz (162020006)
   2. Arwa Sayed Ibrahim   (162020091)
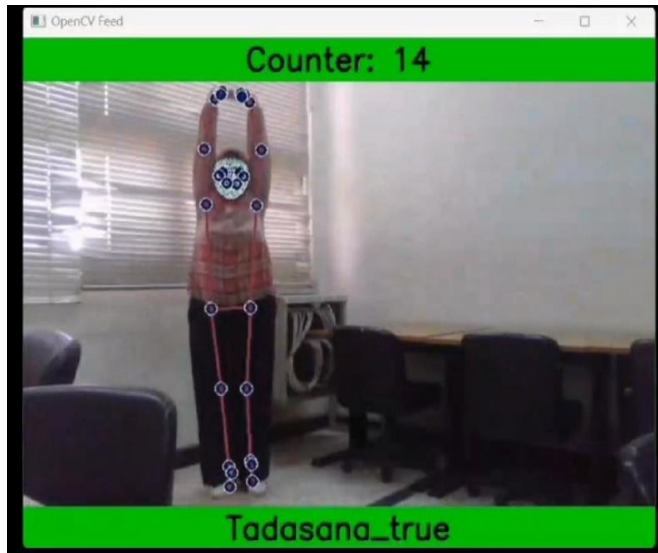   3. Ahlam Reda Abdel Monim   (162020015)

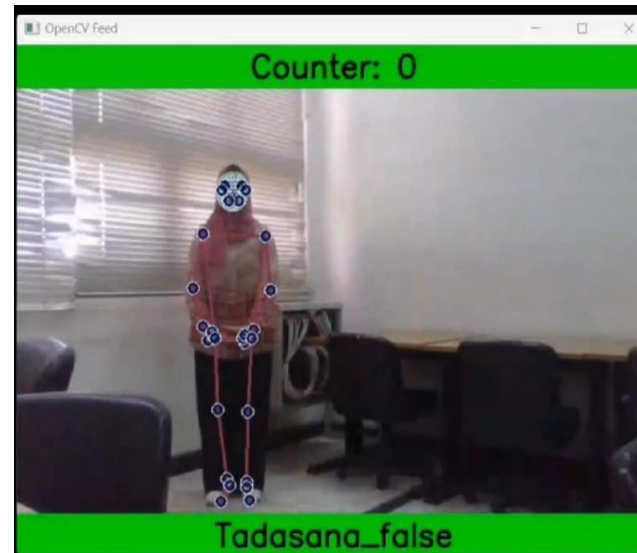# Task description

- **AI gym trainer:**
  - ✓ The system that was created saves its users wasted time in gyms and money spent on hiring a private trainer, as it detects whether the yoga exercise Tadasana "mountain pose" is correct or incorrect in real time by extracting the basic points of the body.

Demo
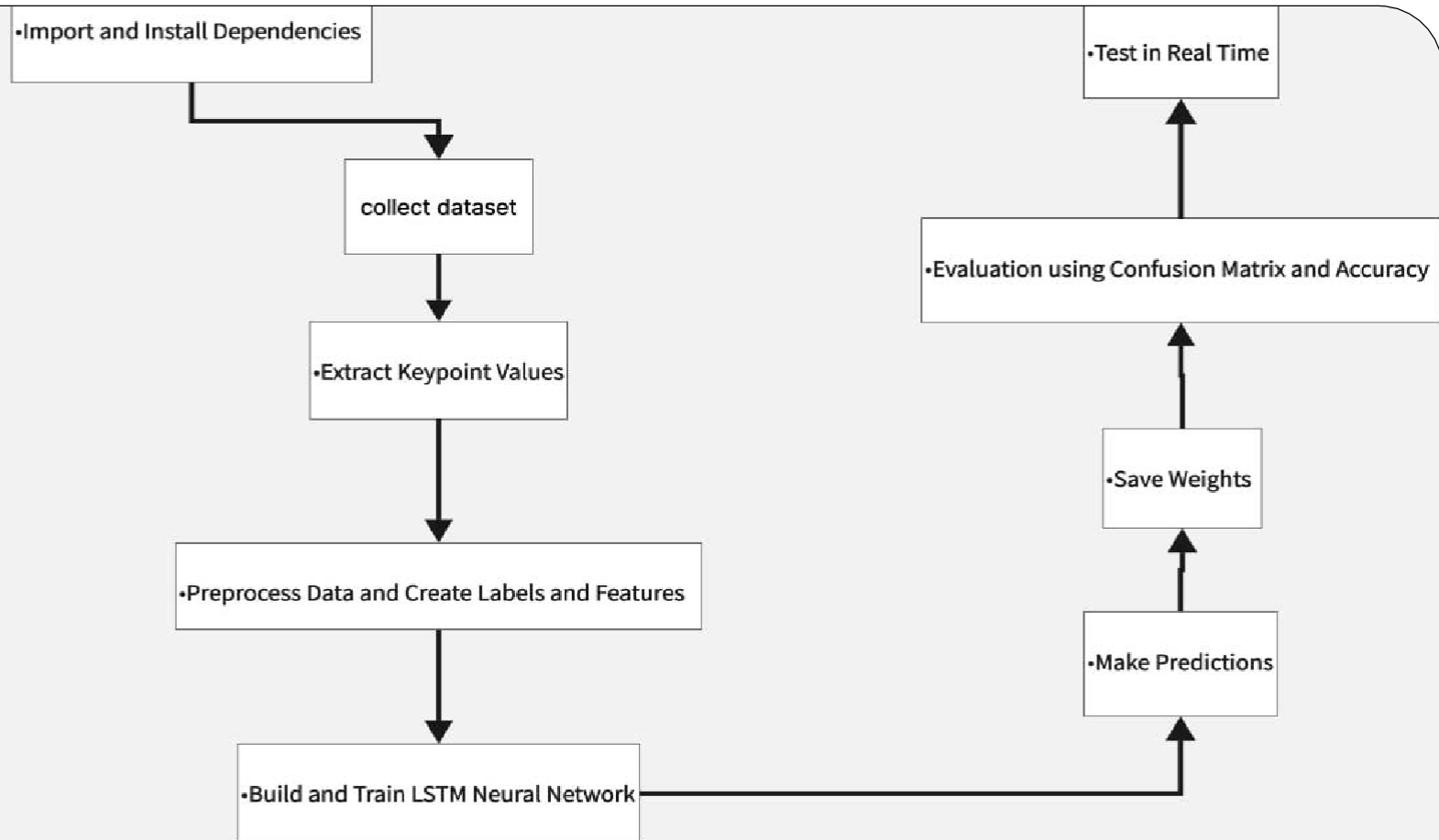
➢ Tadasana_true

➢ Tadasana_false

Contribution

- We obtained the correct data set of Tadasana from the Kaggel website and trained the model on it

- We create the wrong data set of Tadasana by ourselves

- We add LSTM layer to the neural network to improve the accuracy .

- EarlyStopping callback in Keras is used to prevent overfitting .

Data

- Collect the wrong data by using web camera .
- Get the 11 video from website :
  https://www.kaggle.com/datasets/pulaksarmah/yoga-videos
- Take 30 frame from every video .
- There are three landmark which are :
    - Pose landmark.

Project Architecture

- Import and Install Dependencies
- collect dataset
- Extract Keypoint Values
- Preprocess Data and Create Labels and Features
- Build and Train LSTM Neural Network
- Make Predictions
- Save Weights
- Evaluation using Confusion Matrix and Accuracy
- Test in Real Time

An illustration explaining the steps to train model

Methods

- We use mediapipe holistic to collect keypoints .
- Train a deep neural network with LSTM ,Dropout , Dens layers for sequence :
  1. Input layer :
     - Type : Tenserflow.Keras.input() .
     - Purpose: Defines the input shape of the input data.

  2. Hidden layers :
     - Type : layers.LSTM , layers.Dense , layers.Dropout
     - Purpose of layers.LSTM : perform LSTM operations on sequances
     - Purpose of layers. Dropout : helps prevent overfitting by randomly setting a fraction of input units to 0 during training   .
     - Purpose of Dens : This layer introduces non-linearity and reduces the dimensionality of the input

Methods

3. Output layers:

- Type : layers.Dense .
- Purpose :
  - representing the number of possible actions in the output
- Activation function : 'softmax' .

- Using OpenCv to make a real time detection .

Results

- Improve accuracy of model training from .55 to .88235294

Thanks