**README INSTRUCTIONS**

**------------"REQUIREMENTS & DEPENDENCIES” --------**

1. **Python Version:** 3.9.9
2. **IDE:** Visual Studio (VS)
3. **Operating System:** Windows
4. Create **Virtual Environment** using following command in VS Terminal:

**“python -m venv virtual\_environment\_name”**

1. Install **libraries** and **dependencies** using following command in VS Terminal:

**“pip install -r requirements.txt”**

**-------------------- "CODE: MAIN.PY”--------------------**

1. **PREPROCESSING (KEYPOINTS SEQUENCES FORMATION):**
2. **Preprocessing Flag:**
3. Make sure **“datasets\all\_classes\_original”** folder contain the required solo or interactions datasets folders which contains each video extracted pose data **“.npy files”** in respective class folders.
4. In order to form sequences and generate sequential (Xdata and Ydata) for your datasets containing N different classes. Please modify the **“duplicate\_and\_sequence\_chunking”** function in **“utils\data.py”** file to include your required classes. Moreover, modify the **“num\_sequences”** value at line 644 to desired value to consider that much sequences per class to form balanced sequences per class.
5. Set your save directory to save Xdata and Ydata.
6. Set **“preprocessing\_flag”** to **True** and select **“User-Defined Input Settings”** option to set your settings for sequential data formation.
7. After specifying settings, your sequential data will be generated.
8. **Following blocks with respective flags are included in main.py:**
   1. **Preprocessing Block**
   2. **Reshaping & Train-Test-Validation Sets Generation Block**
   3. **Training Model Block**
   4. **Evaluation Of Saved Model On Test Set Block**
   5. **Hyperparameters Tuning Block**

If you want to use any of the blocks, make sure to set it flag to **True** else **False** whennot in use**.**

**--------------------INFERENCE--------------------**

**1-** To start inference of the proposed model, **RUN** the **“Inference\_GUI.py”**.

**2-** Load saved model weights by clicking **"Browse Model Weights"** button and load the **"proposed\_model\_weights.h5"** file from the **"inference"** folder. When model weights are loaded, make sure the **"Browse Model Weights"** button border turns **BLUE**.

**3-** Load the pose extraction model **(YOLO v8)** by clicking **"Browse Pose Model"** button and load the **"yolov8n-pose.pt"** file from the **"inference"** folder. When pose model is loaded, make sure the **"Browse Pose Model"** button border turns **BLUE**.

**4-** Open the video file by clicking **"Browse Video"** button and load any test inference video from **"inference\_sample\_videos"** folder located in **"inference"** folder. **OR** load any solo\_action/interaction video. Please note that **video-filename** must start with either **"solo"** or **"interaction"** else inference won't work.

**NOTE:** If any other variant of InterAcT model is trained having different architectural and training settings. Make sure to add both (**model architecture and training**) settings in the **Initialization** of **“Inference\_GUI.py”**.

**--------------------DATASETS FOLDER--------------------**

The **“Datasets”** folder contains the preprocessed pose data (train, test and validation sets) which were utilized in training and evaluation of the proposed model.

***1- PRE-PROCESSED POSE DATA SPLITS:***

(A) TRAINING SET PERCENTAGE: 80%

(B) TEST SET PERCENTAGE: 10%

(C) VALIDATION SET PERCENTAGE: 10%

***2- DATASETS NAMES:***

**(A) UT-INTERACTION:**

Action Category: Interactions (Human-Human)

Number of Classes: 5

Classes Names: **[** handshaking, hugging, kicking, punching, pushing **]**

Download Link: [**https://cvrc.ece.utexas.edu/SDHA2010/Human\_Interaction.html**](https://cvrc.ece.utexas.edu/SDHA2010/Human_Interaction.html)

**(B) DRONE-ACTION:**

Action Category: Solo/Single Person Actions

Number of Classes: 13

Classes Names:

**[** clapping, hitting\_bottle, hitting\_stick, jogging\_front\_back\_view, jogging\_sideview, kicking, punching, running\_front\_back\_view, running\_sideview, stabbing, walking\_front\_back\_view, walking\_sideview, waving\_hands **]**

Download Link:

[**https://drive.google.com/file/d/15F-hX33kELHDkvnv-lkbPyAvPCF6Ohz9/view?usp=sharing**](https://drive.google.com/file/d/15F-hX33kELHDkvnv-lkbPyAvPCF6Ohz9/view?usp=sharing)

***3- USAGE:***

**(A)** If you want to use this preprocessed data in our proposed model, copy the content (**.npy files**) of **"train\_test\_validation\_data"** folder to the **"datasets"** folder (if not exists).

**(B)** If you want to use this preprocessed data for any other model, copy the content (**.npy files**) of **"train\_test\_validation\_data"** folder to the desired directory.