King Fahd University of Petroleum and Minerals

Department of Information and Computer Science

ICS471 Deep Learning (221)

ICS 471 Project: Sign Language Recognition

Due date: 21/12/2022

Sign language recognition is the task of recognizing the sign gesture in a video stream and outputting its equivalent word or label. This problem is a branch of video captioning tasks. Each video consists of a single sign as shown in the figure below:

In this project, you will develop a recognition system to recognize the sign in each sign video of the KArSL dataset. KArSL is an Arabic sign language dataset. There are three versions of this dataset KArSL-100, KArSL-190, and KArSL-502. In this project, you will work on KArSL-100 which consists of 100 signs. The dataset was performed by three signers and each signer repeated each sign several times. The videos are already converted into frames (18 frames for each video) and the structure of the dataset is as follows:

- Signer ID (ex. 01 for signer 01)
    - Train
        - 0071 (sign folder)
            - Video#1 Frames folder (ex. 03_01_00071_(01_12_15_52_44))
                - frame1.jpg
                - frame2.jpg
                - ….
            - Video#1 Frames folder
                - frame1.jpg
                - frame2.jpg
                - ….
            - ……
        - 0072
        - ….
    - Test

In this project, you need to develop a deep learning model for sign language recognition. You should report the accuracy in the signer-dependent and signer-independent modes. In signer-dependent mode, you train the system and test it using samples from the same signer using the *Train* and *Test* folders of that signer. In signer-independent mode, you train the system on two signers and test it on the third signer. You should report the results as follows:

- **Signer-dependent**

Signer	Accuracy
01	
02	
03	

- **Signer-independent**

Signer	Accuracy
01 (trained on 02,03)	
02 (trained on 01,03)	
03 (trained on 01,02)	

You should submit a jupyter file(s) that contains your code, and it shows the output of each code cell.

To download the dataset, please follow this link.