

APRENDIZAJE PROFUNDO PARA PROCESAMIENTO DE SEÑALES DE IMAGEN Y VÍDEO

LAB2-Session1: Video Classification Baseline Random vs Fixed mode

1.Objectives

This session has two main objectives: become familiar with the use of programming tools in python PyCharm / Google Colab, and develop a basic or "dummy/baseline" video classification system. For this purpose, the UCF101 video classification dataset and two very simple video classification algorithms will be used.

- The first algorithm consists of randomly selecting the video class prediction (**Random mode**).
- The second algorithm consists of always choosing the same class of video for every prediction (**Fixed mode**).

UCF101 is an action recognition dataset of realistic action videos, collected from YouTube, having 101 action categories. This data set is an extension of UCF50 dataset, which has 50 action categories. With 13320 videos from 101 action categories, UCF101 gives the largest diversity in terms of actions and with the presence of large variations in camera motion, object appearance and pose, object scale, viewpoint, cluttered background, illumination conditions, etc., it is the most challenging data set to date.



This session will be carried out in pairs (**individually if Covid-19 restrictions**). The requirements for the delivery of the session results are described in section 3.

2.Instructions

Step 1: Download session files

Session 1 files:

- /data
 - /checkpoints
 - /sequences
 - /test
 - /train
 - /ucfTrainTestlist
 - classInd.txt
 - ...
 - 1_move_files
 - 2_extract_files
 - UCF5.zip
- data.py
- processor.py
- random_vs_fixed_mode.py
- Session_1_Video_Classification_Baseline_Random_vs_Fixed_mode.ipynb

Step 2: New Project PyCharm (or directly python commands) or New notebook Google Colab.

Recommendations: Learn how to use both of them. Use PyCharm for coding and debugging. Use Google Colab for running code for long periods of time (training, testing, fine-tuning, etc.)

- **Option1: PyCharm (or directly python commands)**

- Activate conda (terminal commands):

- In your conda directory “/opt/anaconda3.7” or “/opt/miniconda” or “/opt/miniconda2” or “/opt/conda”

- source activate*

- Create new conda environment and activate it

- conda create --name VideoClassification python=3.6*

- conda activate VideoClassification*

- Install requirements, python packages:

- conda install numpy keras ffmpeg*

- Create a new PyCharm project, during the new project process; select the Session 1 folder and chose the previously created “VideoClassification” conda environment: “/home/userX/.conda/envs/VideoClassification/bin/python3.6”

- **Option2: Notebook in Google Colab**

- In order to manage your Notebook and connect to your Google Drive: follow beginner’s instructions: <https://colab.research.google.com/notebooks/intro.ipynb>

- Use the “Session 1 Video Classification Baseline Random vs fixed mode.ipynb”

Step 3: Prepare the data

- Unzip all files from UCF5.zip to /data directory (only files, do not create a UCF5 folder)

- Run python files:

- 1_move_files.py

- 2_extract_files.py (Basic run: class_limit 5 classes and seq_length 5)

Step 4: Run algorithms random and fixed modes (Basic run: class_limit 5 classes and seq_length 5)

-Run python files:
-random_vs_fixed_mode.py

3.Assignment

Two tasks

- Task 1.1: Follow all the steps and run the “random_vs_fixed_mode.py” code
- Task 1.2: Run the “random_vs_fixed_mode.py” 5 times, one for each video class, *fix_mode=“ApplyEyeMakeup, ApplyLipstick, Archery, BabyCrawling, BalanceBeam”*. Compare the random results vs the five different fixed mode results. Which mode gets the best results? Why? Which mode gets the worse results? Why?