Alexandria University
Faculty of Engineering
Computer and Systems Engineering
Department

CSE343 Embedded Systems
Assigned: Monday 08/05/2023
Due: Saturday 13/05/2023

Lab Experiment 07: Machine Learning Inference and WiFi

Objectives

- Getting introduced to machine learning inference using Python-Jupyter notebook and ESP32.
- Getting familiar with WiFi connections using ESP32.

Part I: Machine Learning Inference

- Project Repository
  Link:https://drive.google.com/drive/folders/1GXuOmYWc0eclNhZPBi2OLO8JMzR27Jmo?usp=share_link
- Make sure that the following requirements are met:
  Link:https://drive.google.com/file/d/1lVGL_RUsszEYFGQHUtDLP86TeUJaQUup/view?usp=share_link
- You are required to run the following sketch on ESP32 for the voice acquisition:
  Link:https://drive.google.com/file/d/1eOfe9-q3yj-ixQDCcyqdr6WKbx5cjDiz/view?usp=share_link
- You are required to run the following interactive python notebook using Jupyter:
  Link:https://drive.google.com/file/d/1F1aSL8ba9YVw9nKnTgFfs66NkB8JkTiL/view?usp=share_link
  Note: We are using Jupyter notebook and not google colab notebooks since Jupyter is running locally and can sense the local hardware connections to ESP32.

References

- ESP32 board installation
  Link:https://randomnerdtutorials.com/installing-the-esp32-board-in-arduino-ide-windows-instructions/
- Running simple ESP32 Sketch:
  Link:https://drive.google.com/file/d/1jQYt5k1yPQ8XD_dxpuc-c_1Ewlc8rPvx/view?usp=share_link
- Jupyter notebook installation
  Link: https://jupyter.org/install
- Simple Jupyter Example:
  Link:https://drive.google.com/file/d/1ZVE6pTiPPrhRSUqA83FdJANF42GrVDbd/view?usp=share_link
- Simple Async Example:
  Link:https://drive.google.com/file/d/1D7tE9jCk3SSdGp_FnBsdTTGbmvhMc4Sp/view?usp=share_link
- Additonal Async Examples:
  Link:https://stackoverflow.com/questions/50757497/simplest-async-await-example-possible-in-python

Part II: WiFi

You are required to run the two sketches on ESP32:

- Run the below sketch to scan the neighbor wifi access points.
  Link:https://drive.google.com/file/d/1FM-T7Qq9Bw7R2q7kh_ug2A19gPAgeXCy/view?usp=sharing
- Modify the ssid and password in the below sketch to connect to your local wifi access point.
  Link:https://drive.google.com/file/d/1j5SVCSSxvNO6lvfpgGAZVkQJ3qUNrVWO/view?usp=sharing

Important Notice: The sketches are included by the below libraries under the examples section of each library.

- WiFi library installed with esp32: **C:\Users\<Username>**
  \AppData\Local\Arduino15\packages\esp32\hardware\esp32\2.0.3\libraries\WiFi\examples

Delivery Policy

- Each group must send a 20-second video for second part showing both the access points list and the granting to your local access point.
- Each group must send the inference python notebook for first part after successful run of all cells.
- You should submit a report showing your schematic diagram and the challenges you faced (if any).
- You should cite any additional resources you used.
- Further details for the submission instructions will be posted later on MS Teams.

Good Luck