IESTI01 – TinyML - 2021.2

Final Group Project **Proposal**

Project Proposal Delivery date: October 20th

Groups should have preferable a minimum of 3 and a maximum of 4 participants.

Suggested Project Template

1. Project name

   Axve

2. Team member names, number (if applicable) and, Institution

   Igor Corrêa Nunes – 31367 – Universidade Federal de itajubá

   Octavio Brugin

3. Project Objectives (Goal) - short description

   Desenvolver um sistema para classificar a presença de aves em um áudio.

4. Longer project description

   Training a neural network model that receives an audio file converts it into a spectrogram of the frequencies present in the signal over a period of 10 seconds with a sampling rate of 44 kHz

5. References (including other code or data), sources of inspiration

   http://dcase.community/challenge2018/task-bird-audio-detection-results

   https://wp.nyu.edu/birdvox/

   https://experiments.withgoogle.com/bird-sounds

   https://create.arduino.cc/projecthub/409822/bird-sound-classifier-on-the-edge-583563

6. Descriptions of the following, at whatever depth the team feels appropriate:

   a. Block Diagram

   b. Hardware to be utilized

Arduino Nano 33 BLE Sense

c. Data collection

https://github.com/kylemcdonald/AudioNotebooks

https://www.wikiaves.com.br/

http://machine-listening.eecs.qmul.ac.uk/bird-audio-detection-challenge/

d. Preprocessing

For prerprocessing we're going to use Audacity to personalize the audio files to create more variety of inputs.

e. Model design

MFE with Convolutional Neural Network

f. Optimizations

Adam

g. In system inference (Deploy)

7. Issues or roadblocks the team envision and potential solutions

- Environment noises like rain , others animals etc.
R.:Increase noises to enrich the dataset

-Adjustments in the number of epochs.
R.:Early stopping

8. The top unresolved question(s) the team have at this point

Suggested Public Dataset repositories to be explored:

- https://www.kaggle.com/datasets
- https://archive.ics.uci.edu/ml/datasets.php
- https://knowyourdata.withgoogle.com/

- https://datasetsearch.research.google.com/

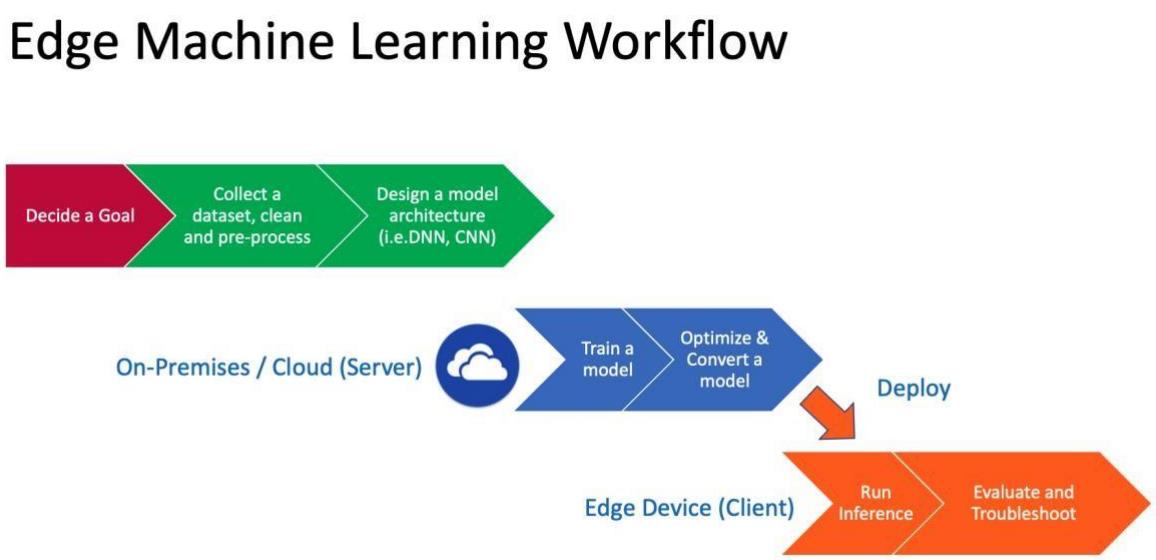
Previous Projects Inspiration:

1. IESTI01 2021.1 - Group Presentations

    - Group 1 - Seismic Detection [Docs] [Video] ○
      Group 2 - Fire Detection [Docs] [Video] ○
      Group 3 - Covid Detection (cough) [Docs] [Video]
    - Group 4 - Mask Detection [Docs] [Video] ○
      Group 5 - Personal Trainer [Docs] [Video]

2. **Harvard CS249r – TinyML - Final Projects**

Suggested Project Workflow



Final Comments

The Project Proposal to be delivered **is not binding**, what means that the group can decide later keep this project or to develop another one completely different.