



Project - Sound Classification

Introduction

In this module, we went through the steps of creating a speech recognition (or keyword spotting) system. This system can be used to create a device that recognizes and classifies other sounds, too!

In this project, we will start with a simple, pre-made dataset, add our own target sound, and build a classifier. We encourage you to find sounds made with something other than your voice!

Please note that at this time, we do not have a way to grade your project. As such, this project is considered a bonus for the course. However, we strongly encourage you to go through these steps to get hands-on experience with machine learning as well as using the Edge Impulse tool.

Required Hardware

For collecting sound data, you should have access to a recording device. This can be a smartphone, a laptop, or a dedicated recording device.

For deploying, you can use either your smartphone or the [Arduino Nano 33 BLE Sense](#).

The smartphone will provide a simple demo only whereas the Arduino board will allow you to change the target sound and trigger audio events. As a result, we recommend using the Arduino, if you have access to it.

Collect Data

We will start with a pre-made dataset from Edge Impulse that includes a generic noise category and a specific sound (a faucet running). Initially, this dataset was intended to be used as a standalone demo that could detect if someone was using a faucet. You are welcome to use just that data, augment it with your own sounds, or collect your own, entirely new dataset.

To start, download the faucet dataset from [this link](#). Unzip it somewhere on your computer.

If you are going to use your own sounds, I recommend collecting at least 50 1-second audio samples (or at least one 50 second recording). Make sure the sound source is in different environments and different recording devices. This will help create a more robust model that can differentiate that sound from other sounds.

For example, I recorded a fan running at different speeds. I moved the microphone to several different locations around the sound in front of, behind, and above the fan, as the sound changes as the angles and distance varied.