RADBLOCK

The Radio that Avoids Advertisements

Tristan Guinto
Kaylx Jang
Brian Truong
Brian Dizon

Professor Brian Demsky

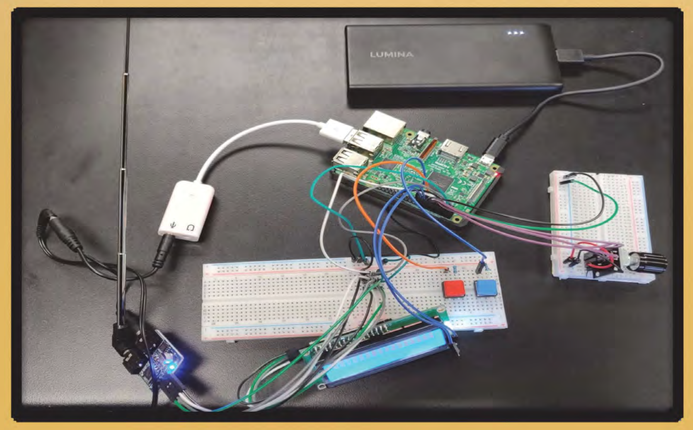
Project Overview

Listen to continuous music on live radio without advertisements!

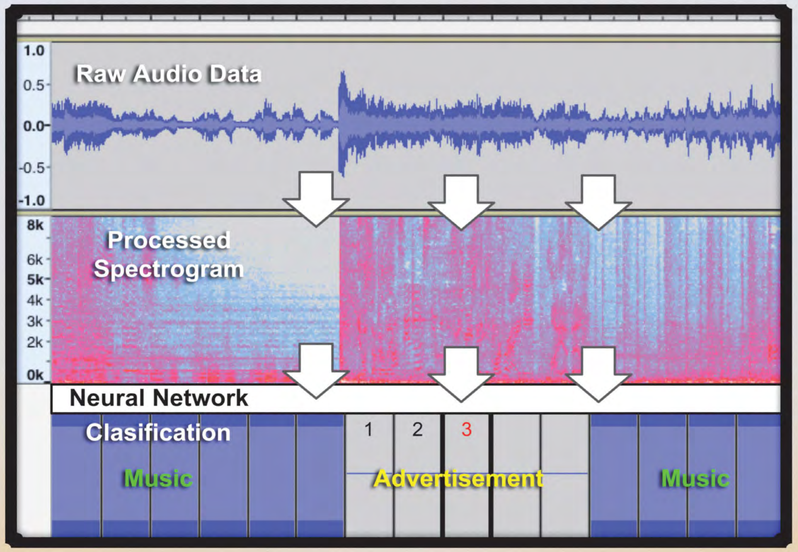
Radblock uses machine learning to detect advertisements and then automatically changes the channel for you.

Hardware

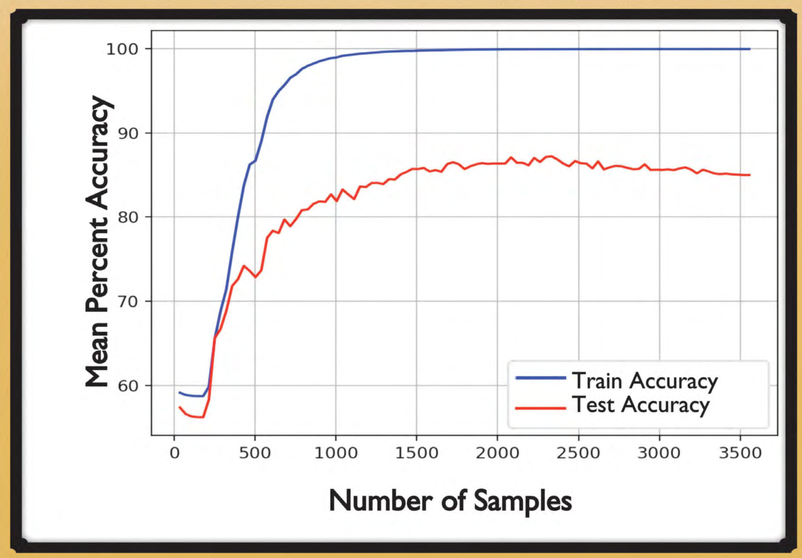
- Designed custom radio device with Raspberry Pi3.
- Used FM Radio Chip to acquire broadcasted audio.
- Recorded audio clips via USB Sound Card.
- Integrated rotary encoder, button, and LCD to manage stations.



Audio Processing



Accuracy vs Training Data Size



Software

- Used a two-layer neural network to classify music and advertisements using TensorFlow.
- Trained on thousands of audio samples gathered from our device.
- Preprocesses the audio using frequency analysis.
- Outputs a prediction every second.
- Waits for 3 seconds of ads in a row to mitigate false positives.
- Changes between known channels when it detects an advertisement.
- Allows user to set and switch between channels.

References

Cerquides, Jose Ramon. "A Real Time Audio Fingerprinting System for Advertisement Tracking and Reporting in FM Radio." IEEE Journals & Magazine, Wiley-IEEE Press, 18 June 2007, ieeexplore.ieee.org/document/4234205?fbclid=IwAR3GbFtmO6ydEui4x1hl7_7KWWlgMFoclKE49ltagzGWzaFEciMmV3fXO4U.

"Socket Programming in C/C ." GeeksforGeeks, 5 Sept. 2018, www.geeksforgeeks.org/socket-programming-cc/

Python Libraries: Tensorflow, Scipy, Numpy, Wave, Sounddevice, Socket

C libraries: WiringPi, WiringPiI2C

The Henry Samueli School of Engineering
University of California • Irvine