



# RADBLOCK

The Radio that Avoids Advertisements

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## Software Designed for Ambiguity

### Modifiable Parameters:

- Quantity of Ad and Music samples
- Length and Quantity of sub-samples
- Sample Rate and Bit rate
- Dimensions of Spectrogram
- Tensor Model Configuration

### Techniques / Details:

- 2 Layer Convolutional Neural Network using TensorFlow
- 44100 samples/sec

## Results of First Test

Spectrogram	1 sample each	1 sample each second
Loss	0.3991	0.1381
Accuracy	99.5	98.32
Raw audio		
Loss	0.0702	0.1473
Accuracy	99.66	97.2

### Analysis:

- Spectrogram vs Raw Audio & Number of sub-samples do not meaningfully affect accuracy
- The ads dissimilar to music were very easy to detect.

## Hardware Antenna & SDR

### Software Defined Radio (SDR)

- Multiple radio channels via software rather than using hardware filters
- Allows direct Radio Frequency, Bandwidth, Spectrogram, Sample Rate, and Bit Rate inputs



## Results

- Connected Raspberry Pi to FM radio
- More advanced outputs and detail via CubicSDR software

## Timeline

- Training Sets Found and Research TensorFlow ID Ads w/ Training Data
- Raspberry Pi Hardware Setup
- Connect to multiple stations to dynamically switch in real time
- Identify more types of music & ads on other stations
- Connect to car AUX via TEA5767
- Automatically detect and tag stations
- Mobile Android/iOS App

## Challenges

- ✗ Reading multiple channels at once
- ✗ Properly ID ads with majority music
- ✗ Account for non-music radio (talking)



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