

# **Runner's Earphones: Custom-Fit Audio System with Intelligent Noise Selection**

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We propose a **smart earbud design and customization platform** that combines:

- **User-designed earbuds** (style, color, finish, theme)
- **Personalized fit** using future ear scanning
- **Intelligent sound awareness** using machine learning

The system allows users to design earbuds that are not only personal and comfortable, but also **aware of their surroundings**.

This project moves beyond aesthetics and sound quality by prioritizing:

- **User safety**
- **Personalization**
- **Human-centered AI**

It demonstrates how **machine learning, design, and hardware concepts** can work together to create smarter consumer technology.



# Current Layout



← ⌛ 127.0.0.1:5500/Applied%20Machine%20Learning/Earbud-designer/index.html

## 🎧 Design Your Custom Runner Earbuds

Choose Color  Pattern  Comfort Fit (Size)

← ⌛ 127.0.0.1:5500/Applied%20Machine%20Learning/Earbud-designer/index.html

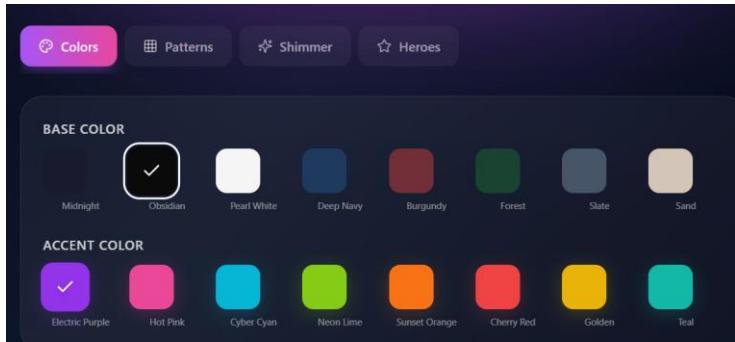
## 🎧 Design Your Custom Runner Earbuds

Choose Color  Pattern  Comfort Fit (Size)

30 114 179  
R G B



# Future Layout



## Sound Alerts

Customize which sounds pass through your headphones

Save Changes

### Select Sound Categories

Choose a location category and select the sounds you want to be alerted about

**Home**

Fire Alarm       Smoke Detector

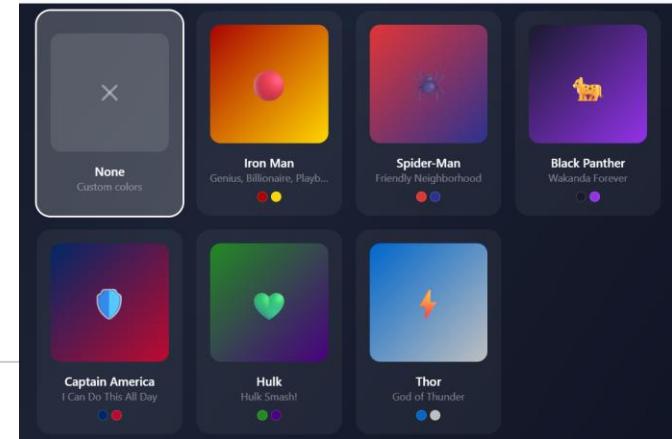
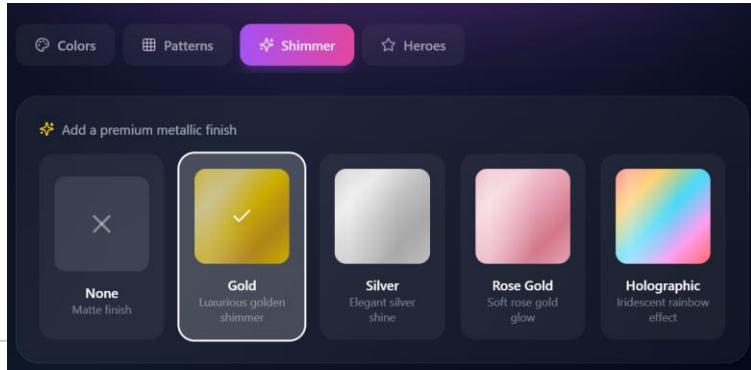
Doorbell       Baby Crying

Dog Barking       Glass Breaking

Appliance Beeping       Water Running

**Office**

**Outdoors**



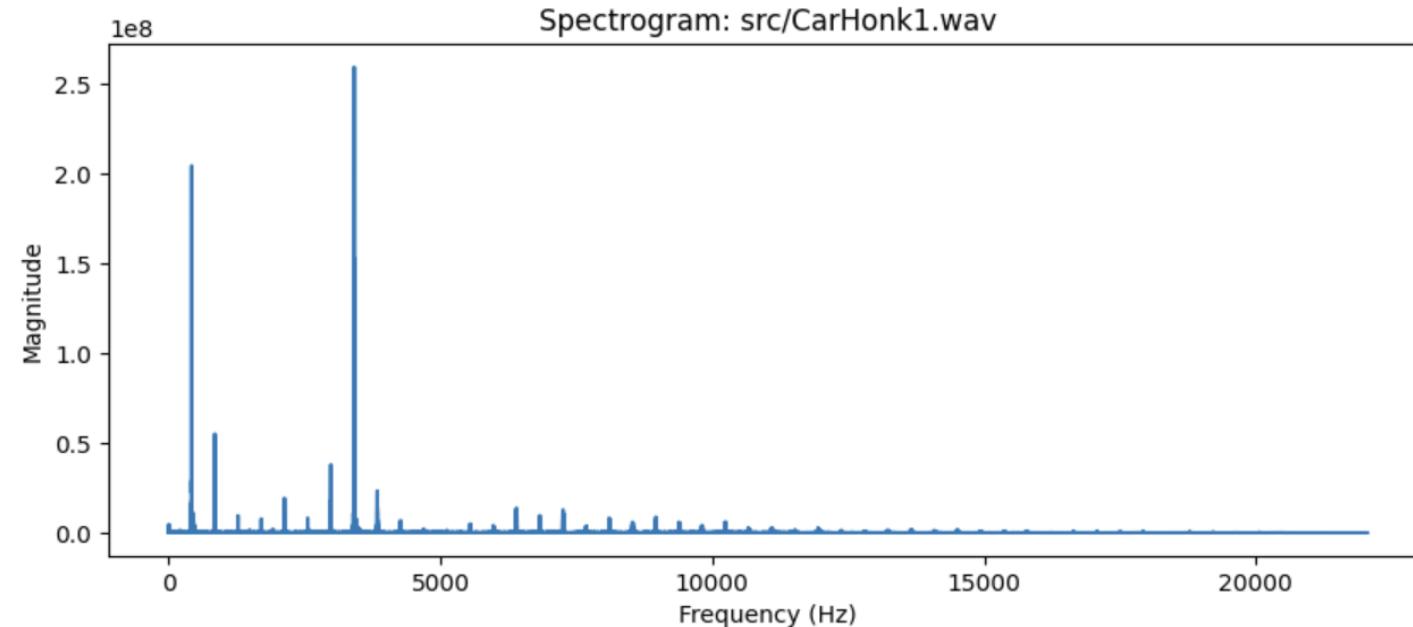


# Detecting the Alarm

- Utilize SciPy to take the Fast Fourier Transform of the received audio
- Break the frequency spectrum into chunks of 500 Hz
- Compare the amplitudes of each chunk to the sample audio for a car horn
- If frequency range is similar, then car horn is detected



# Detecting the Alarm



# Thank You! Questions?

