

AI Audio Enhancement

The Problem

- Can we use AI to enhance lossy audio files to near-lossless quality?

Why Solve This?

- Reduce streaming bandwidth for music services
- Save device storage by storing lower quality, enhancing during playback
- Enable near-lossless audio over Bluetooth with lightweight AI

Solution Overview

- Train AI on paired lossy/lossless audio datasets
- Learn differences, reconstruct higher-quality audio
- Use objective metrics (e.g., ViSQOL) to measure quality

Key Goals

- Understand codecs, sample rates, compression, formats
- Implement audio evaluation metrics
- Master AI training, datasets, upscaling
- Train model to convert lossy to near-lossless
- Develop A/B/C testing for user comparison
- Simulate real-world streaming conditions

How We Solve It

1. AI Model Training

- Paired lossy/lossless datasets
- Upscaling techniques

2. Objective Evaluation

- Use metrics to rate audio quality

3. User Testing

- A/B/C: Original, Lossy, Enhanced
- Visualize waveforms, spectrograms
- Playback for each

4. Real-World Simulation

- Mock streaming environment
- Device-side enhancement

Milestones & Timeline

- **Week 1:** Research codecs, formats, metrics
- **Week 2-3:** Train AI model, build dataset
- **Week 4:** Build UI for A/B/C testing, display metrics

The Vision

- Smarter audio streaming
- Better sound, less bandwidth
- Real-time enhancement on any device

Next Steps

- Build evaluation test bed
- Train and validate AI model
- Develop user-facing app
- Simulate streaming, deploy on devices

Questions?

Let's make audio smarter, together.