

BUILDING RADIO'S FUTURE

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Duke | Code <+>



Stakeholders:
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Jake Bromberg, WXYC

Background

By working with local college radio stations, WXDU (Duke) & WXYC (UNC), our aim is to understand current radio technology concerns and create open-source, maintainable, and accessible software for all non-commercial radio stations.

Tech Stack

WEB
nodejs
tailwindcss
nextjs
mongoose

DB & API
ExpressJS
MongoDB

MOBILE

Expo
TypeScript
NativeWind
React Native

VLM

OpenAI GPT-4
Ollama
mix-vlm
tailscale
Pinecone

User Needs

Based on 13 semi-structured, 30-minute interviews with DJs at WXDU + UX workshop + stakeholder ideas, we identified the following needs:

- Increase ease of web-streaming WXDU and accessing currently-playing track information
- Highlight WXDU's DIY culture & music scene history
- Enable non-technical DJs to update blog, contact, and visual content without touching code
- Enable listeners to better explore past shows, charting new releases, & DJs' music recs
- Increase communication between DJs and listeners
- Strengthen WXDU's role as a hyper-local & community-centered music hub
- Allow DJs with varying technical experience to learn about/contribute to WXDU software
- Create a more streamlined, intentional mobile listening experience

Features

WXDU Website

- Streaming ticker + Nav Bar, Now Playing widget
- Retro UI design; Homepage banner of archive materials; dynamic background
- TinaCMS-editable blog and schedule .csv parser
- Listen page shows recently played songs & past playlists
- DJ Request line to text/call on-air DJ
- Explore page surfaces WXDU top plays & upcoming local shows from internal DBs
- GitHub organization

WXDU Mobile App

- A lightweight, listening-focused app to stream WXDU & contact the on-air DJ

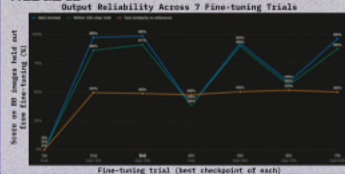


Vision Language Model

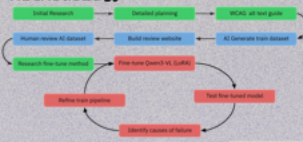
Background

Album covers are an important part of the music experience, yet they remain largely inaccessible to blind and low-vision users. We fine-tuned an open-source vision-language model to generate accessible text alternatives for album artwork.

Results



Methodology



Example

Alt text:
Yellow pickup truck carrying a large red spike object in its bed; desert landscape background with Joshua trees; blue-orange sky.



Future

Software development

- Implement more requested features
- Work with WXDU to deploy mobile app

Vision Language Model

- Continue to generate alt text
- Release our finalized LoRA adapters

Handoff & beyond

- Move to WXDU-owned GitHub organization
- Discuss contribution guidelines