

EchoFeel — Emotion-Aware Voice AI Using Hybrid MATLAB & Python Framework

The Problem We Solve

Round 0



Impact

Enables emotionally intelligent communication tools for underrepresented users — including rural, low-literacy, and non-English speakers.



Emotions Are Missing in Machines

In sensitive voice interactions—like therapy, education, or customer support—tone matters as much as words. Yet, most voice AIs today only transcribe, not understand emotion



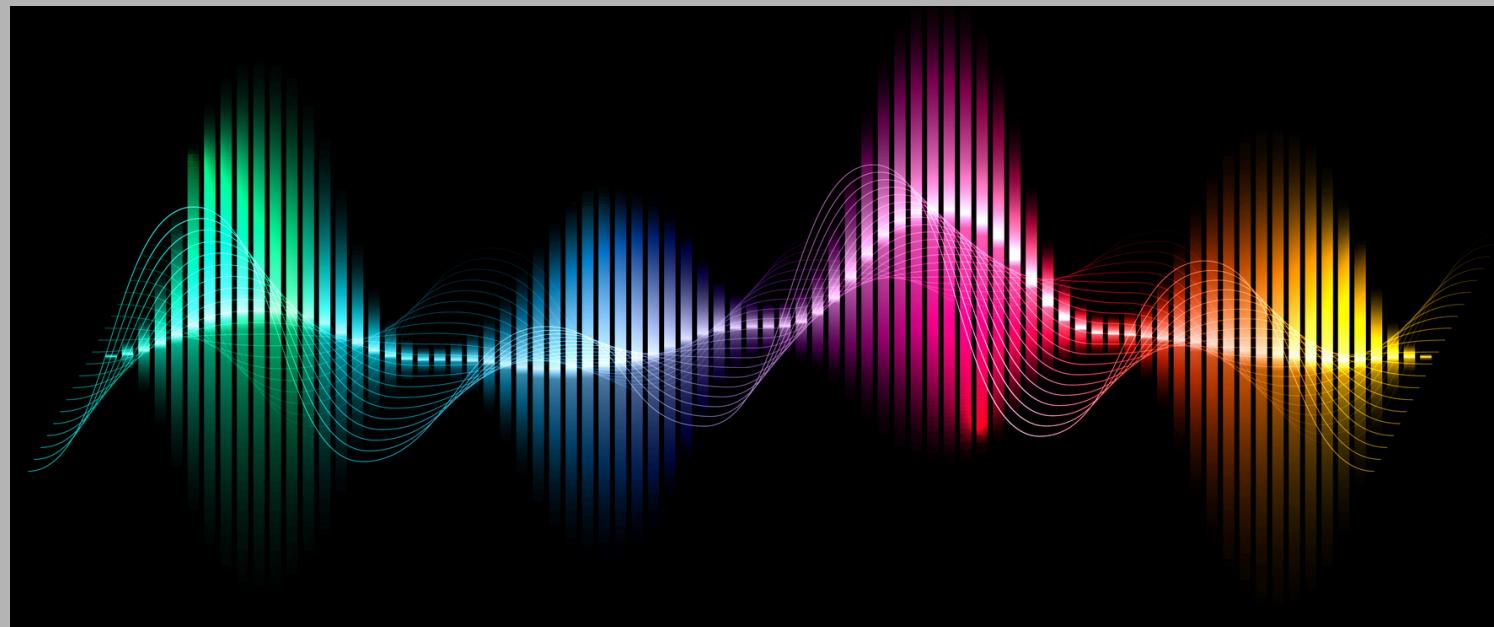
Our Goal

Design a lightweight, accessible voice system that detects emotions from speech (happy, sad, angry, neutral), even in noisy or rural settings.



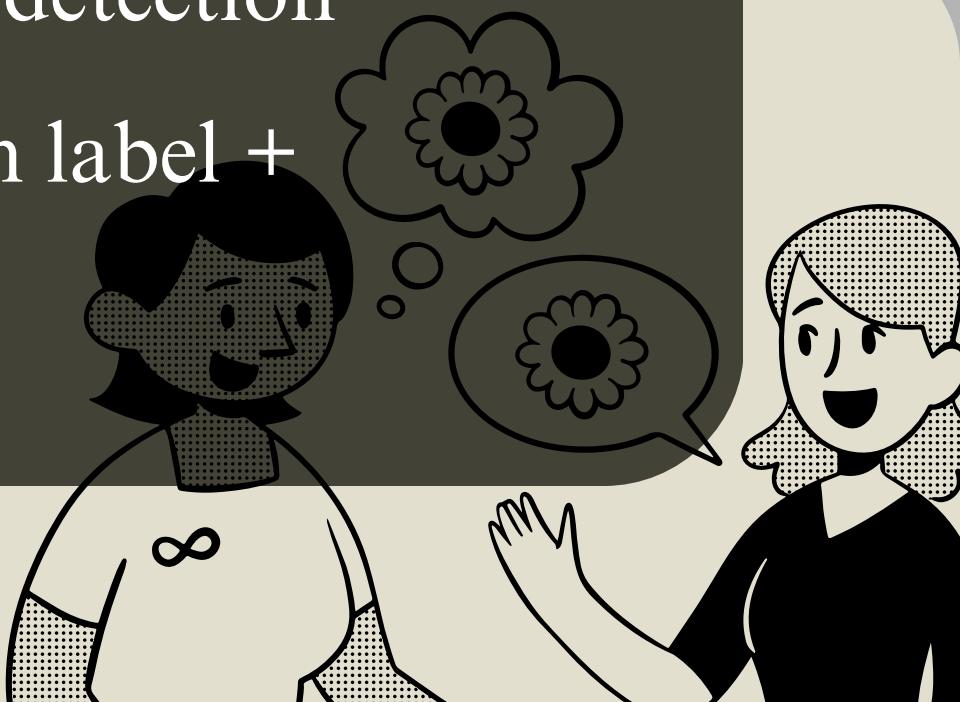
TEAM MEMBERS - Radhika B & Lakshana B

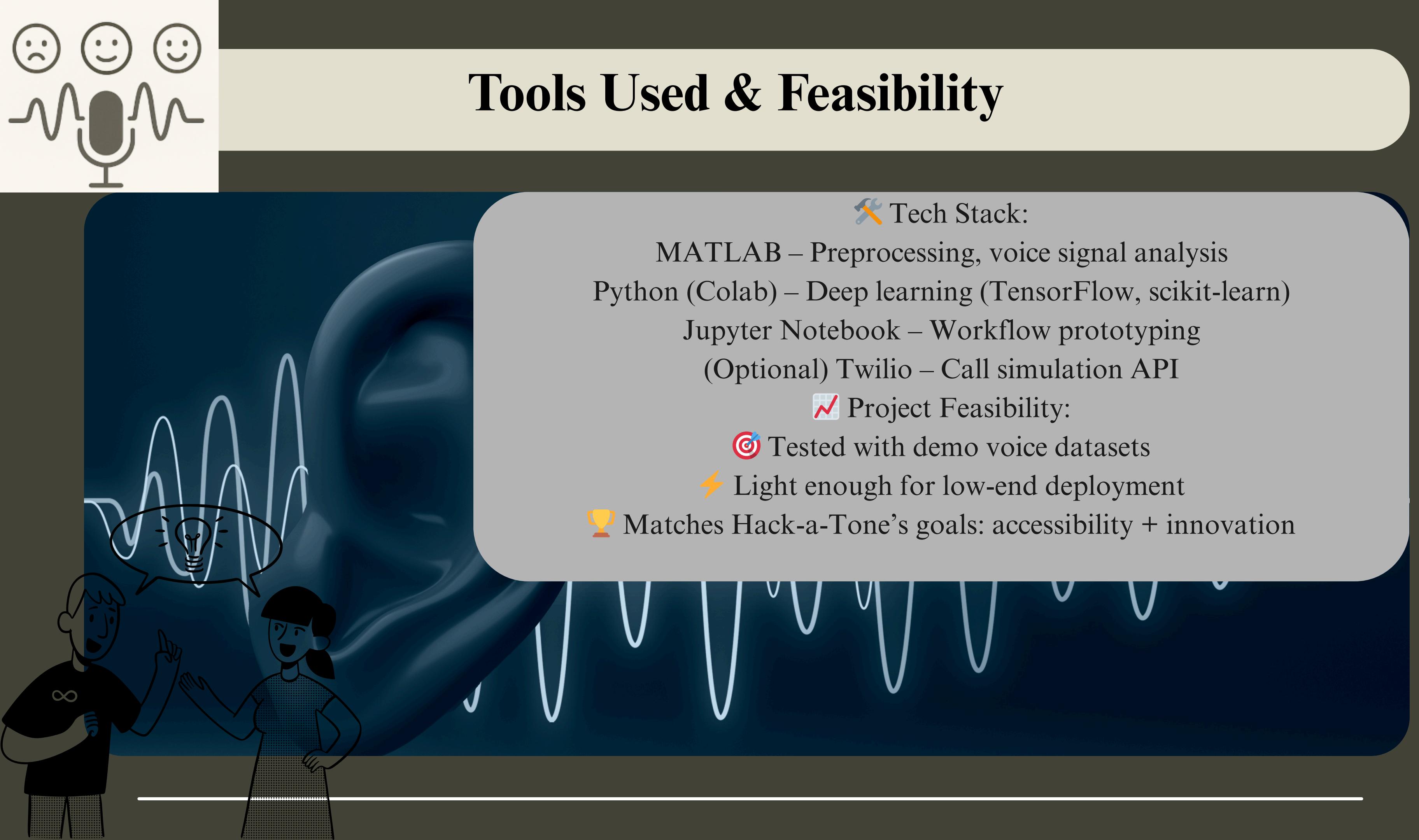
How EchoFeel Works



What Makes It Unique:
Works in real-time on voice notes/calls
Can run on basic devices
Language-agnostic, future-ready for
regional language adaptation

- 1 Voice Input
- 2 MATLAB — Signal denoising & features (MFCC, pitch)
- 3 Python/Colab — RNN/CNN model for emotion detection
- 4 Output — Emotion label + Confidence score





Tools Used & Feasibility

🔧 Tech Stack:

MATLAB – Preprocessing, voice signal analysis
Python (Colab) – Deep learning (TensorFlow, scikit-learn)
Jupyter Notebook – Workflow prototyping
(Optional) Twilio – Call simulation API

↗️ Project Feasibility:

- 🎯 Tested with demo voice datasets
- ⚡ Light enough for low-end deployment

🏆 Matches Hack-a-Tone's goals: accessibility + innovation

PROBLEM STATEMENT AND SOLUTION

ECHO FEEL

- 1.A multilingual voice AI that detects emotions (happy, sad, angry) from user speech.
- 2.Enables personalized voice interactions for government access, tourism, or rural mentorship.
- 3.Runs emotion detection via audio preprocessing (MFCC in MATLAB) + Python ML classifier.

ROUND 1



Features Implemented (MVP)

Core MVP Functionality

- ✓ Emotion recognition using MFCC and Python classification
- ✓ Voice sample input support
- ✓ Heatmap & visualization of emotion predictions



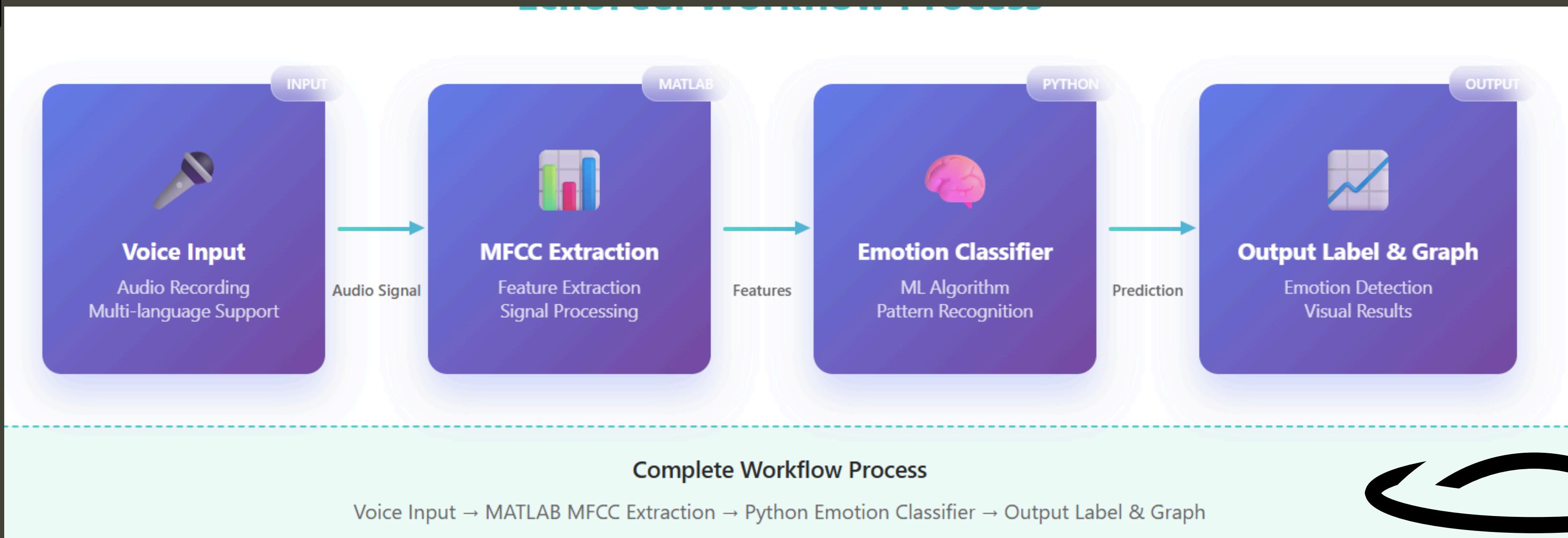
- ✓ Sample dataset tested with multiple labels
- ✓ Modular design – adaptable to local languages

Tools & Technologies Used

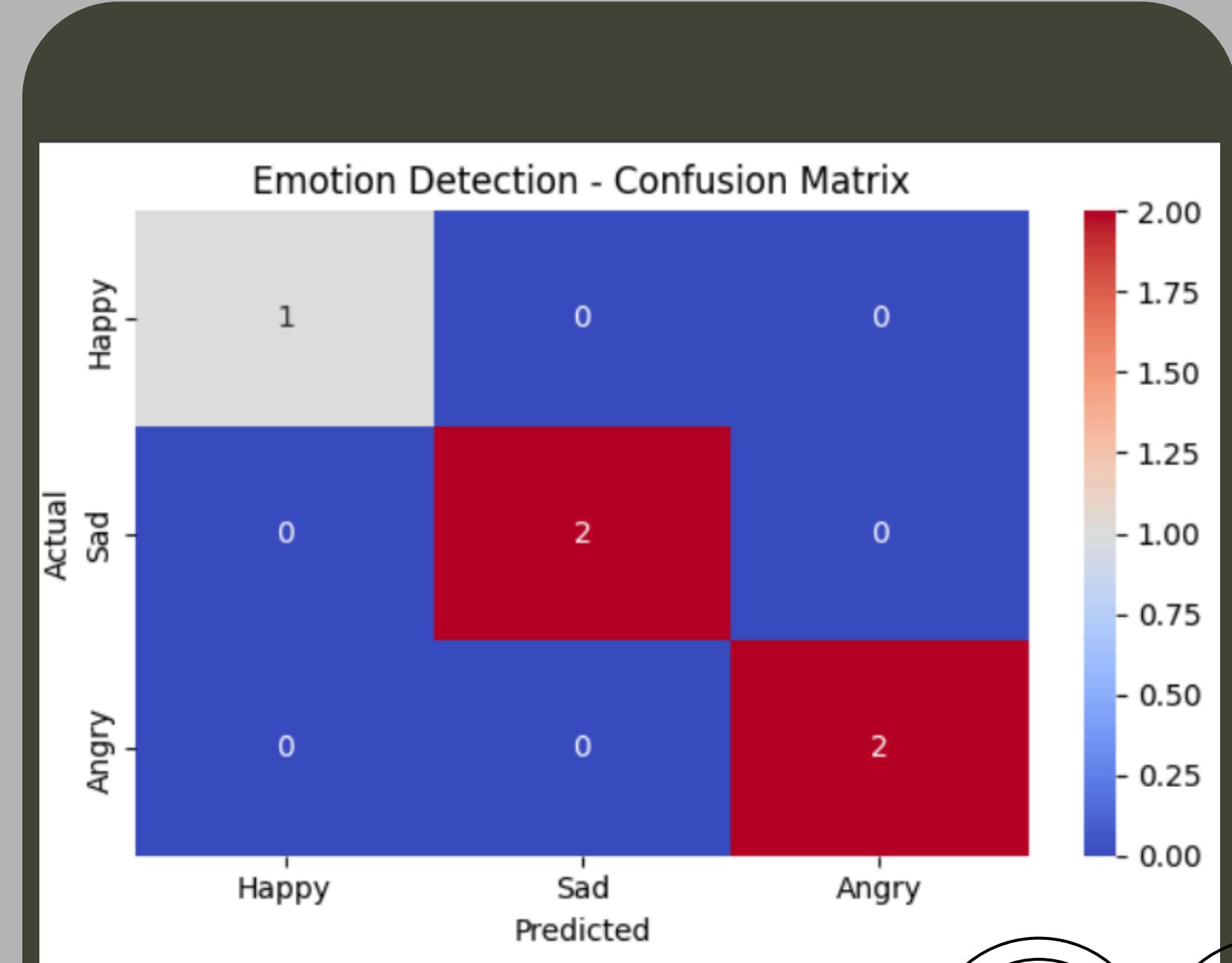
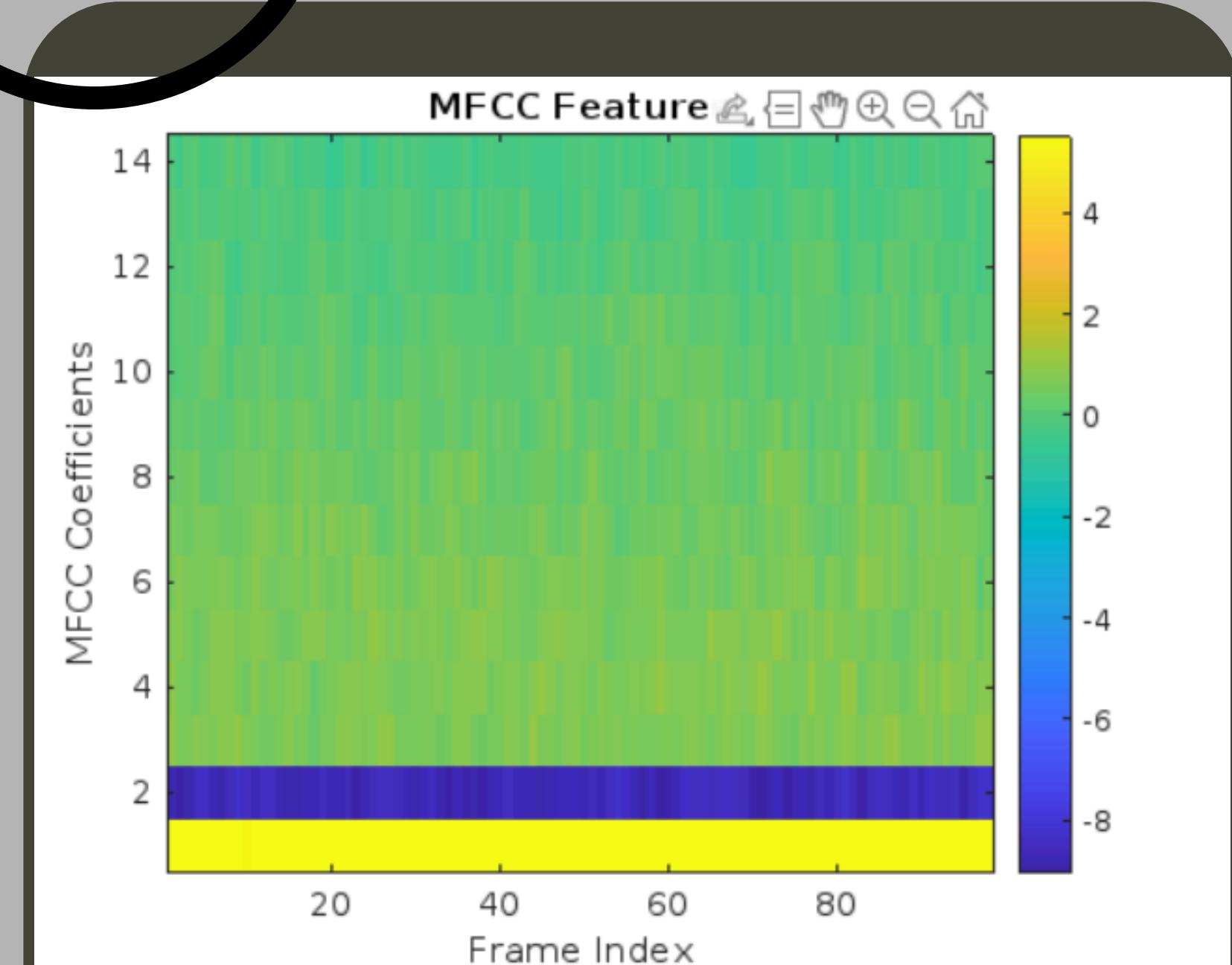
Tools,
Framework
s &
Languages

1. MATLAB: Voice preprocessing, MFCC feature extraction
2. Python: Scikit-learn, librosa, seaborn/matplotlib
3. GitHub: Code management
4. Colab: Model training and testing
5. Video: Demo walkthrough

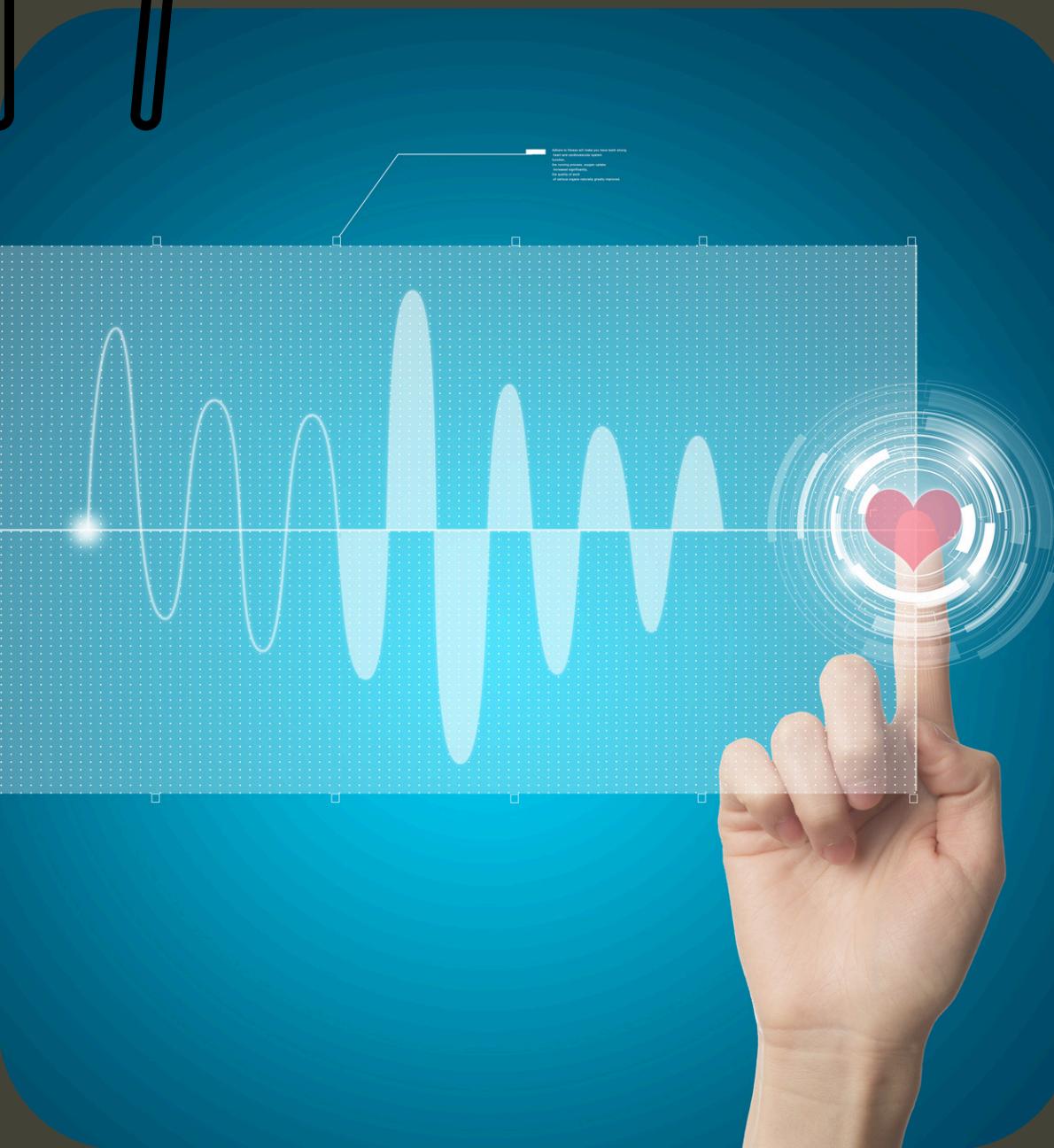
Workflow Architecture



Output Demonstration



Innovation & Differentiators



Why It's Unique

- Voice-based emotion recognition – low-cost + cross-language
- Can work with basic phones (audio-only)
- Custom-trained on localized data
- Opens door to emotional intelligence in rural AI agents





Final Thoughts – EchoFeel



Conclusions And Recommendations

- Our MVP demonstrates the core functionality: from voice input to real-time emotion prediction with visual output.
- It opens doors for applications in public service, rural mentorship, and tourism through voice-based emotional intelligence.

