

Voice-to-Voice Conversational AI (Hindi - English)

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1 Project Description

This project enables a real-time voice conversation in Hindi using AI-based transcription, translation, and text-to-speech synthesis. The system operates in the following steps:

1. **Voice Input:** User records speech in Hindi.
2. **Speech-to-Text:** Hindi speech is transcribed using Groq's Whisper model.
3. **Translation:** Transcribed Hindi text is translated into English.
4. **AI Response:** Llama 3.3-70B model generates an AI response in English.
5. **Translation Back to Hindi:** AI-generated English response is translated into Hindi.
6. **Text-to-Speech:** The translated Hindi response is converted into speech using ElevenLabs API.
7. **Voice Output:** The AI-generated Hindi voice response is played back.

2 Modules Overview

- **Streamlit UI:** Provides an interface for voice recording and playback.
- **Speech Processing:** Uses Groq's Whisper model for speech-to-text conversion.
- **Translation:** AI-based translation between Hindi and English.
- **Conversational AI:** Uses Llama 3.3-70B for response generation.
- **Text-to-Speech:** Utilizes ElevenLabs API for speech synthesis.

3 Installation Instructions

3.1 Prerequisites

Ensure you have the following:

- **Python 3.8+**
- Required dependencies (install via `requirements.txt`)
- API keys for:
 - **Groq API** (for speech-to-text and LLM)
 - **ElevenLabs API** (for text-to-speech synthesis)

3.2 Setup

1. Clone the repository:

```
git clone this repo
cd to this downloaded zip folder after extracting it.
```

2. Install dependencies:

```
pip install -r requirements.txt
```

3. Configure API keys in `.env` file.

4. Run the application:

```
streamlit run app.py
```

4 Usage Instructions

- **Step 1:** Start the application and record your voice in Hindi.
- **Step 2:** The system will transcribe, translate, process, and generate a response.
- **Step 3:** The AI-generated response will be played back in Hindi as synthesized speech.

5 Demo Video

Watch the demo video for a live demonstration of the project: `demo_video.mp4`

6 Contact

For any questions, contact `cse210001056@iiti.ac.in`.