Developed By

Unnati Mittal
B.Tech CS (3rd year) – KIET Group of Institutions
Gen AI Virtual Internship (Batch 1) – Final Project

1. Project Title

VoiceGlobe – AI Powered Multi Language Translator

2. Project Description

This project involves building a Generative AI-powered translator that enables natural and context-aware text translation across multiple languages. The solution explores modern Natural Language Processing (NLP), Prompt Engineering, and Large Language Model (LLM) integration for multilingual communication.

The core idea is to allow users to input English text and translate it into any of the 200+ supported global languages using Meta's NLLB-200 model. The system is also integrated with a Text-to-Speech (TTS) module to make the translation experience more interactive and accessible.

3. Objectives

- To explore the use of NLP and LLMs for multilingual translation.
- To support over 200 languages using FLORES-200 codes.
- To integrate speech synthesis for accessibility.
- To design an interactive and responsive UI using Gradio.

4. Tools & Technologies Used

Technology	Purpose
Python	Programming language
Gradio	Frontend for user interaction
Transformers (Hugging Face)	NLLB-200 translation model
Torch	Backend support for model loading
gTTS	Google Text-to-Speech
JSON	Language code mapping

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5. Key Features

- Supports 200+ languages via FLORES-200 standard.
- Text-to-Text translation using a fine-tuned model.
- Text-to-Speech output, enhancing accessibility and interactivity.
- Interactive UI built with Gradio Blocks API.
- Custom-styled buttons and layout with embedded CSS.
- Deployable on both GitHub and Hugging Face Spaces.

6. Working Procedure

Step 1: Load Language Mappings

- language.json contains language names and their corresponding FLORES-200 codes.
- Code dynamically maps selected language to code using a helper function.

Step 2: Translate Text

- User types text in English.
- User selects the target language.
- Meta's facebook/nllb-200-distilled-600M model performs the translation.

Step 3: Convert Text to Speech (Extra Feature)

- The translated text is passed to gTTS.
- gTTS generates an audio output (.mp3) that is automatically played back.

8. Deployment

- Hosted on GitHub with all source files.
- Also deployed as an interactive app on Hugging Face Spaces.

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Extra Highlight

Additional Feature Added:
A Speech System was integrated using gTTS, which allows users not only to see the translated text but also hear the translated output. This feature makes the app accessible for children, visually challenged individuals, and language learners.