AI-Powered Sign Language Translator

Enhancing Communication for the Hearing Impaired

Team Members: Zain, Tinos Noe (Mr. Nerd Eco)

Hackathon: AI Connectivity Hackathon

Introduction

- Overview: The AI-Powered Sign Language Translator is designed to bridge communication gaps between hearing and non-hearing individuals using AI-driven sign language recognition.
- Key Features:
- - Sign language detection using AI
- - Gesture-to-text translation
- - Text-to-speech for communication

Problem Statement

- Challenge: Communication barriers between deaf and hearing individuals.
- Solution: AI-powered translator to help overcome this communication gap.

How It Works

- 1. Webcam Feed: Captures the user's sign language gesture.
- 2. AI Processing: The captured gesture is processed by the AI model.
- 3. Text & Speech Output: Displays the translated gesture as text and reads it aloud for the user.

Technology Stack

- Frontend:
- - React.js for the UI
- - Tailwind CSS for responsive design
- - React Webcam for capturing gestures
- Backend:
- - AI model for sign language gesture recognition
- - Axios for API requests to the backend
- Other Tools:
- - SpeechSynthesis API for text-to-speech functionality
- - React Icons for UI enhancements

Features and Functionalities

- 1. Real-Time Gesture Recognition: Captures and processes gestures in real-time.
- 2. Text-to-Speech: Translates gestures into speech for easy communication.
- 3. User-Friendly Interface: Simple and responsive UI designed with accessibility in mind.

Demo

- Live Demo: A screenshot or video showing the AI sign language translator in action.
- This demo shows how the system captures a gesture and translates it into text and speech.

Challenges

- Challenges Faced:
- - Gesture recognition accuracy
- - Real-time processing of gestures
- - Ensuring accessibility and responsiveness across devices
- Solutions:
- - Continuous training of the AI model for improved accuracy
- - Optimization of the frontend for faster response times

Impact

- Social Impact:
- - Promotes inclusivity by breaking down communication barriers.
- - Helps improve accessibility for deaf and hard-of-hearing individuals.
- Future Scope:
- - Expanding the model to support more sign languages.
- - Integration with mobile devices and wearables.

Team and Acknowledgments

- Team Members: Zain
- Special Thanks: AI Connectivity Hackathon for providing the platform.

Contact Information

- **GitHub:** https://github.com/ZAINAZHAR303/Signify
- **LinkedIn:** https://www.linkedin.com/in/muhammad-zain-azhar-114558250/
- **Website:**

  https://signify-flax.vercel.app/