

Voice-Based Intelligent Personal Assistant Using NLP and Speech Recognition

Abstract:

Voice-based personal assistants are becoming integral to modern technology, offering hands-free control of various tasks. This project aims to develop a **voice-based intelligent personal assistant** that uses **Natural Language Processing (NLP)** and **speech recognition** to assist users with tasks such as setting reminders, answering questions, and controlling smart devices.

Methodology:

The system will leverage **speech-to-text** technology (e.g., Google Speech API, DeepSpeech) to convert spoken language into text. NLP models such as **intent recognition** and **named entity recognition** will then be used to understand the user's command. The assistant will utilize **text-to-speech synthesis** (TTS) to respond back to the user. Advanced models such as **BERT** or **GPT** will help enhance the context awareness and conversational flow of the assistant. The system will also integrate with external APIs to retrieve weather data, perform online searches, and control IoT devices.

Outcome:

The expected outcome is a fully functional voice-based personal assistant capable of understanding natural speech and executing commands in a seamless and intuitive manner. The system will enhance user convenience and accessibility, particularly for users with physical disabilities, by enabling voice interaction with technology. Over time, it will learn from user preferences and interactions, becoming more personalized.