Voice-Controlled Home Appliances System Using VC-02 Module Without Internet

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Project Members

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Introduction

This project, completed by the above team members, implements an offline voice-controlled system for home appliances using the Ai-Thinker VC-02 voice recognition module. The system enables users to operate multiple household devices via voice commands without relying on any internet connection, ensuring privacy and reliability.

Project Overview

- **Objective:**
  To design and build a home automation system that responds to custom voice commands for controlling appliances, with all processing done locally on the VC-02 module.
- **Key Features:**
  - Offline voice recognition (no internet required)
  - Customizable wake and command words
  - Control of multiple appliances via a relay module
  - Immediate audio feedback for recognized commands
  - Enhanced privacy and reliability over cloud-based systems

Hardware Components

- Ai-Thinker VC-02 Kit (offline voice recognition module)
- 5-channel relay module
- Power supply (5V)

- Connecting wires
- Household appliances (e.g., lamps, fans)
- Enclosure/cabinet for mounting

System Configuration

1. Firmware and Command Setup:

- Access the Ai-Thinker voice platform to configure:
    - GPIO pin mapping
    - Wake word (e.g., "Hey Home")
    - Appliance-specific and group command words
    - Custom system responses

2. Hardware Wiring:

- Connect VC-02 GPIO outputs to relay module channels
- Wire relay outputs to appliances
- Ensure safe power connections and proper insulation

Operation

- The system listens for a wake word to activate command mode.
- Recognized commands trigger specific GPIO pins, activating corresponding relays to control appliances.
- System provides verbal feedback for each command, confirming execution.
- All processing is performed locally, ensuring fast and reliable operation.

Applications

- Smart home automation
- Assistive technology for elderly or disabled users
- Energy management
- Hands-free control for safety and convenience

Conclusion

This project demonstrates a practical, robust, and privacy-focused approach to voice-controlled home automation. By leveraging the VC-02 module's offline capabilities, the system offers reliable operation and user-defined customization without the risks or limitations of internet-dependent solutions.