

Internet of Things Project using Python (CSE 4110)

Mid-Term Project Presentation on

Raspberry Pi Pico Bluetooth Home Automation System using Voice Recognition

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Introduction

01 IOT Revolution

The IoT revolution has transformed the way we interact with the physical world, enabling the collection and exchange of data from interconnected devices.

02 Home Automation Significance

- i. Efficiency & Conveniences
- ii. Energy Conservation
- iii. Flexibility & Remote Control
- iv. Personalized Comforts

03 Project Extension

Building upon a normal Bluetooth Controlled Home Automation project, this project introduces voice command as control mechanism.

Literature Survey

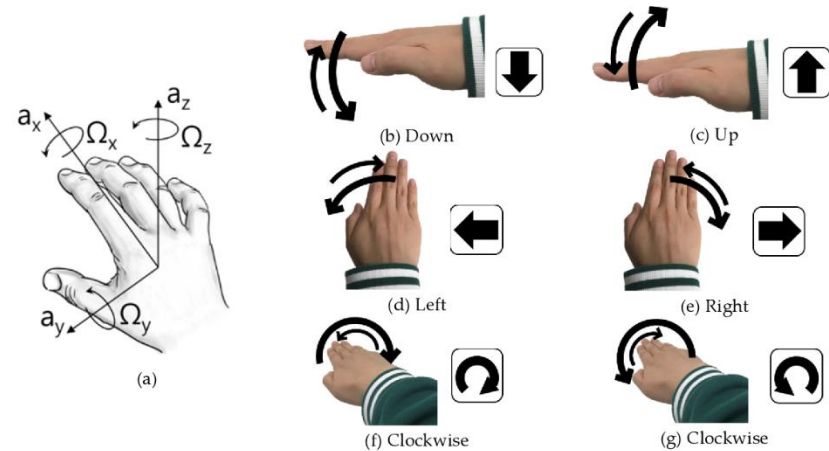
I. Home automation system using Android application

- Smart-lighting
- Smart door lock
- Smart sensors (Humidity, Temp.)



II. Home Automation system based on Gesture Human-Machine Interface (GHMI)

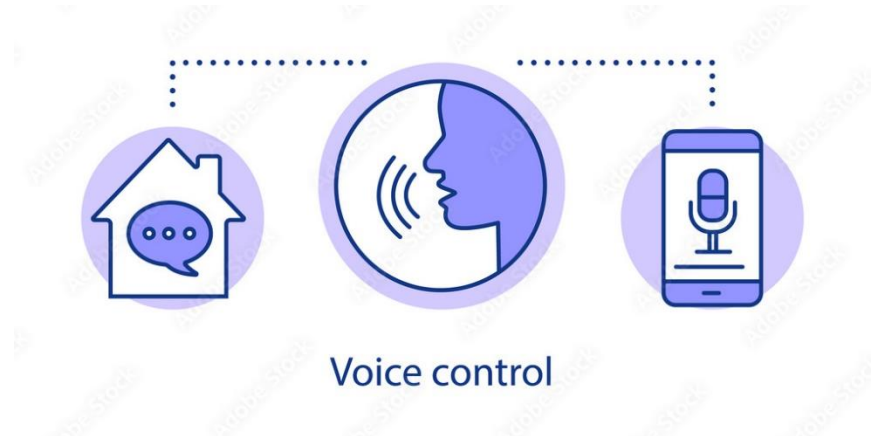
- Kitchen Chimneys
- Smart Tv's



Literature Survey

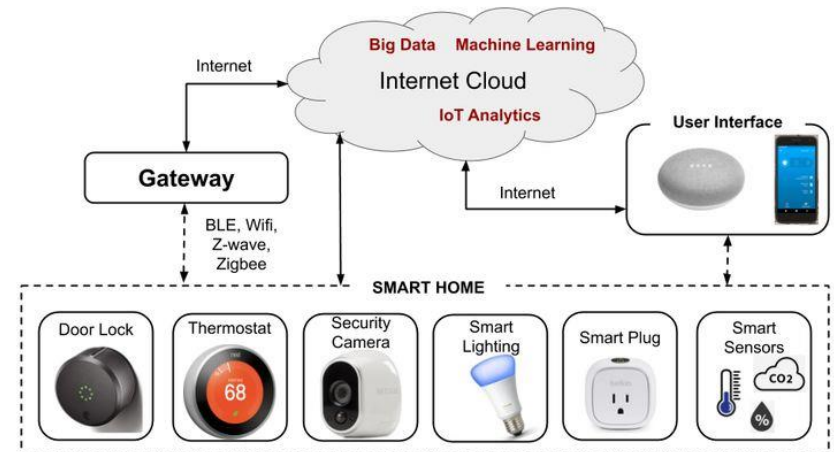
III. Home Automation System Using Voice Recognition Module HM2007

- Smart-lighting
- Smart plugs (Turn on/off)
- Smart sensors (Humidity, Temp.)



IV. Home Automation System Using Speech Recognition and Machine learning

- Allowing users to interact with the home automation system in a more conversational manner, like asking "What's the weather today?" or "Tell me about my schedule."



Design Scheme

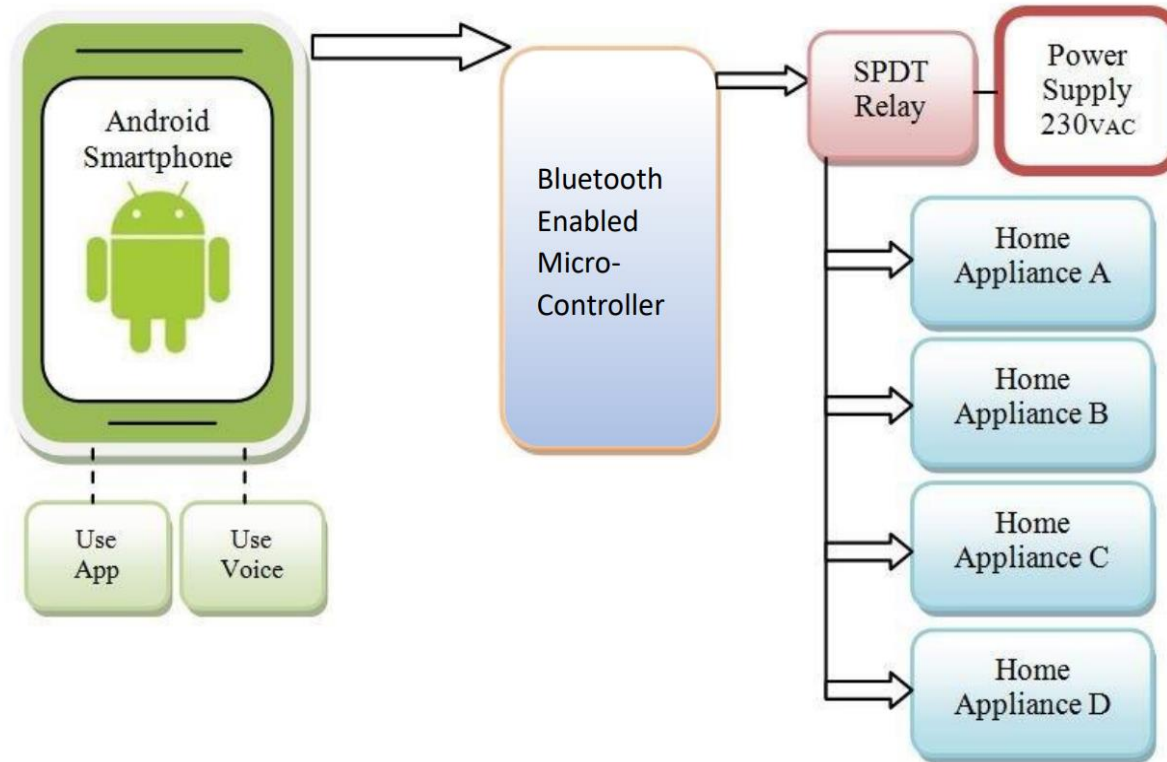
Components

The Home Automation project utilizes the following components:

- Raspberry Pi Pico W microcontroller
- HC05 Bluetooth Module
- 5 V 4-Relay Module
- 0.5 W Bulbs
- Bread Board
- Jumper Wires
- 5 V adapter

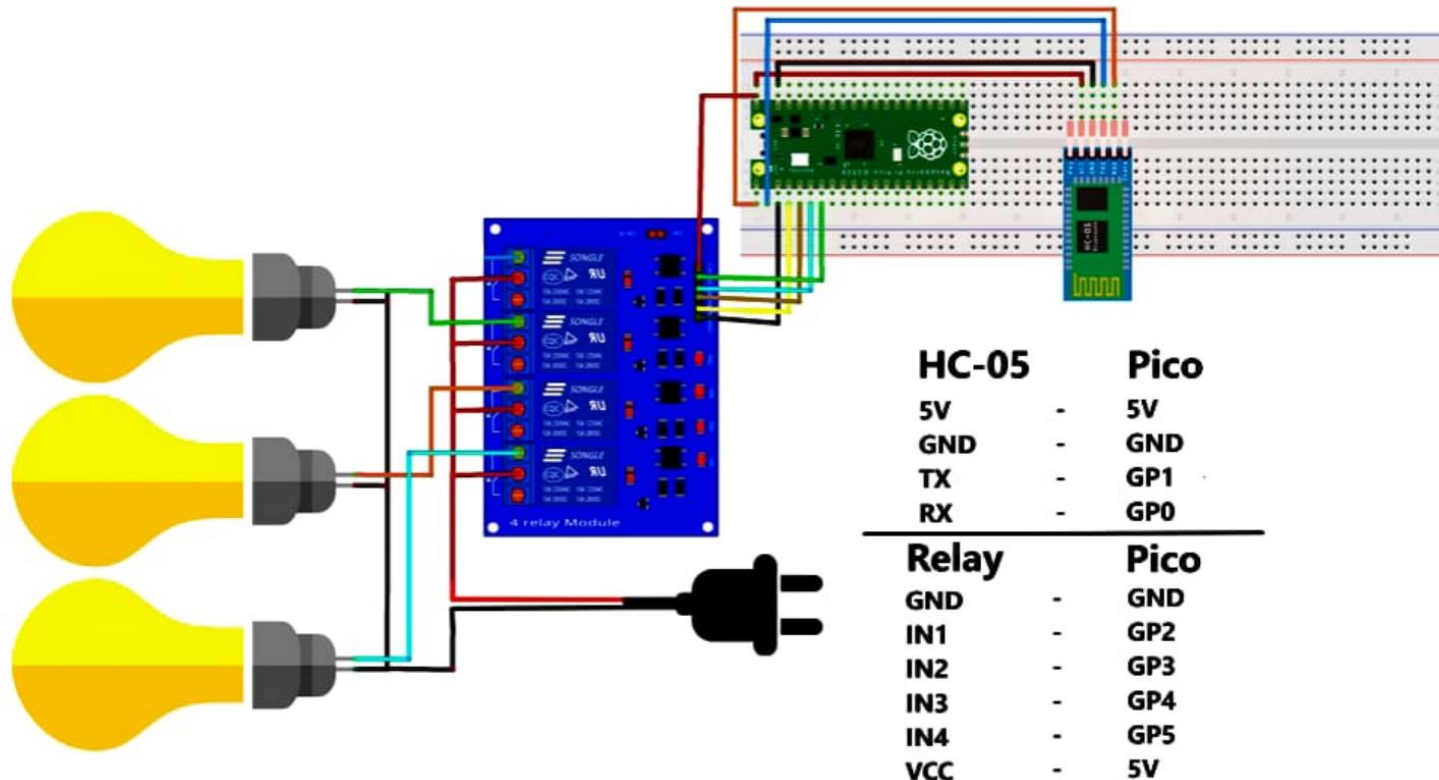
Design Scheme

Block Diagram



Design Scheme

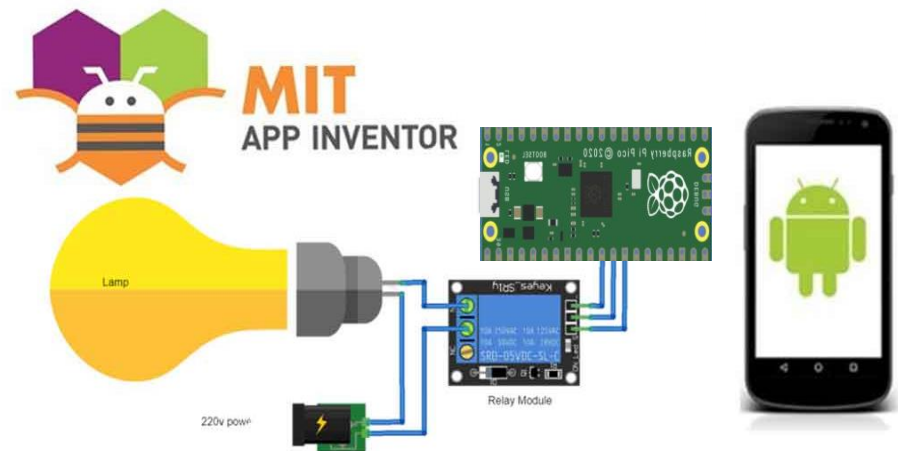
Circuit Diagram Diagram



Design Scheme

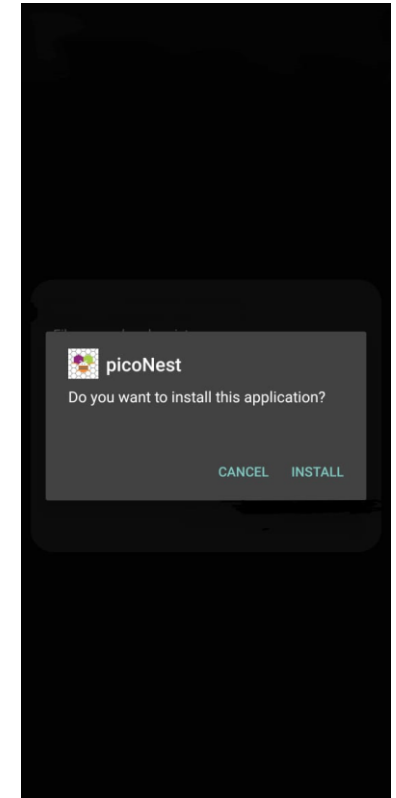
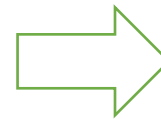
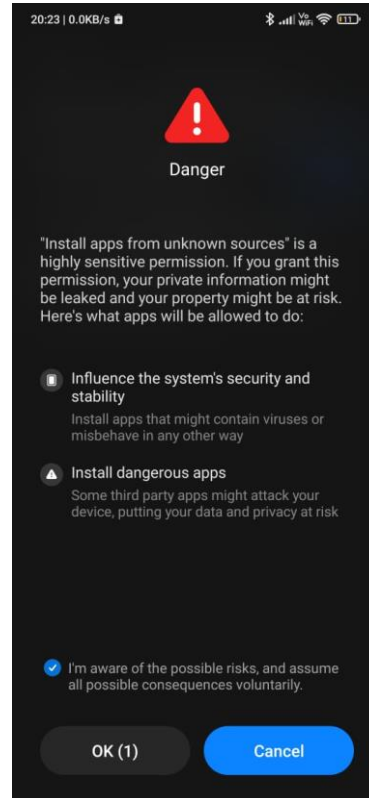
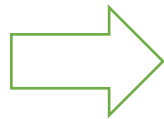
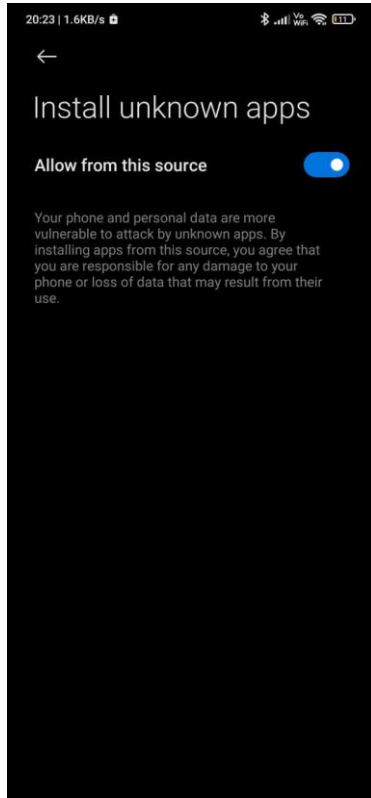
MIT App Inventor

- Open Source
- Web-Based Platform
- Blocks Editor
- Real-Time Testing
- Educational Focus
- Community Support



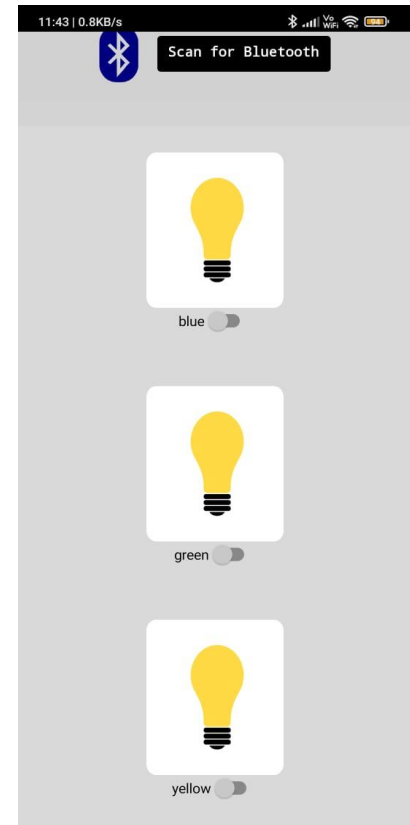
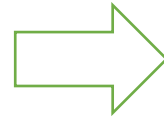
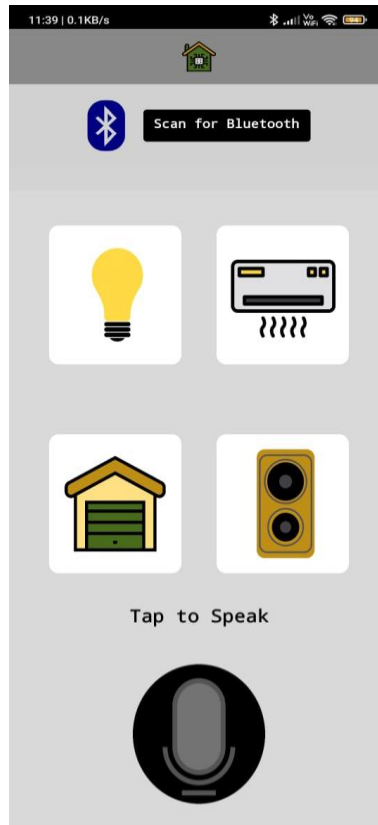
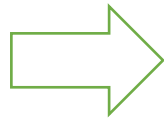
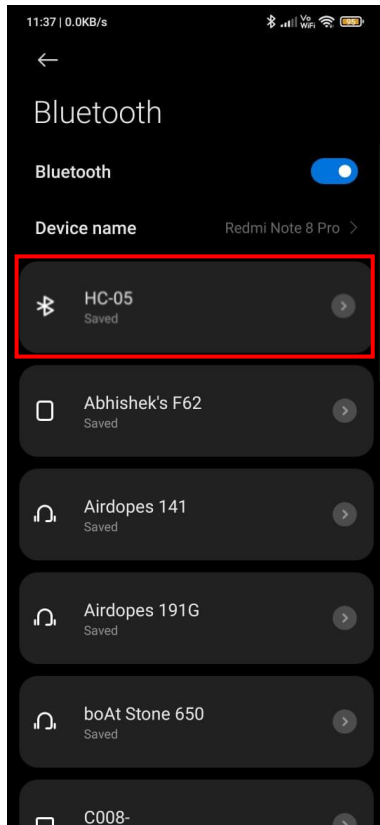
Testing

- How to ensure the app works correctly



Testing

- How to ensure the app works correctly



Evaluation

- **Pros**

- i. Voice Recognition
- ii. Real-Time Testing
- iii. Programming Blocks
- iv. Beginner Friendly
- v. Cloud Storage

- **Cons**

- i. Screen Limitation
- ii. Security
- iii. OS Limitation

Socio-economic Issues Associated With The Project

- i. Affordability and Accessibility
- ii. Technological Literacy and Education
- iii. Data Privacy and Security
- iv. Job Displacement
- v. Dependence on Technology

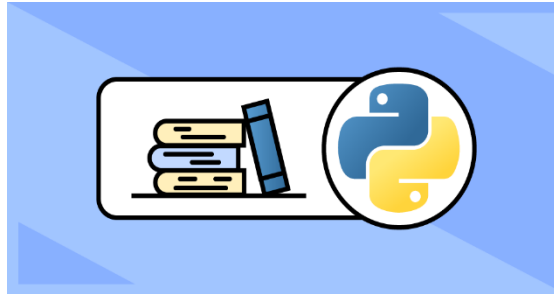
Engineering Tools And Standards



01

Programming Languages

MicroPython
programming language
and Thonny used for IoT
application development
with Raspberry Pi Pico W.



02

Libraries

A UART (Universal
Asynchronous Receiver-
Transmitter) library
facilitates serial
communication between
microcontrollers or devices



03

MIT App Inventor

MIT App Inventor is a
user-friendly, visual
programming
environment that
enables individuals
without coding
experience to create
Android applications

Conclusion

- **Technological Innovation:**

The Voice Controlled Home Automation project showcases significant technological innovation, employing Raspberry Pi Pico and HC05 Bluetooth Module for seamless device control through voice commands.

- **Socio-Economic Awareness:**

Beyond technology, the project underscores the importance of considering socio-economic factors, emphasizing the need for accessibility, affordability, and inclusivity in the adoption of smart home solutions.



ANY
QUESTIONS?

