Summary of the Research Paper:
Smart Home Automation System

A Glimpse into the System

This paper presents an affordable, wireless, IoT-based home automation system (HAS), which adjusts to environmental conditions. It uses NodeMCU as the main control unit, and allows remote access through smartphones. Seamless access to in-house appliances is provided by a cloud server based communication system. The system aims to improve everyday living conditions for elderly and disabled individuals.

Key Learnings and Takeaways

Features:

The system allows remote management of electrical appliances with Android phones, using the NodeMCU microcontroller and the BLYNK app. This can be done via voice commands through Google Assistant and IFTTT as well as switch controls. Real-time appliance status is shown on the BLYNK app. NodeMCU connects to a 4-channel relay module to control power supplied to the connected devices. It emphasizes smart living and energy savings. The system also enhances safety with secure network protocols (SSL over TCP, SSH) which serve to deter intruders.

Advantages:

- Provides user-friendly installation avoiding legalities along with strong and secure theft prevention protocol, as well as a 150 feet in-house range.
- Flexible integration which allows removal and addition of appliances as required

Limitations:

- Currently works only on Android
- Requires internet access for voice-to-text on earlier versions of Android
- Vulnerable to external noise; voice commands may be misinterpreted

Future Scope:

- Making the system compatible with other operating softwares such as Windows and iOS.
- Incorporating passive infrared (PIR) sensors for motion detection in the security subsystem.
- Integrating Digital Temperature and Humidity (DHT11) sensors for humidity and temperature monitoring which also adjusts fans and air conditioning accordingly. Light Dependent Resistors (LDRs) detect daylight and control lights.

References

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