

## ABSTRACT

Efficient and Flexible Room Temperature Control System has become a crucial necessity in the ever-evolving environment of today. This research aims to design and develop a solution for energy conservation in room air conditioning control. A system is implemented within the Room Air Conditioning Control System Design. This system utilizes Microcomputers and Cameras for human detection and headcount in the room, enabling optimal temperature settings based on the presence of individuals within the room.

The system employs microcontroller-based fuzzy logic to control the AC unit based on desired temperature and occupancy. Fuzzy logic provides adaptive and flexible decision-making based on room temperature and user preferences, automatically adjusting the temperature according to the current conditions.

The system integrates an Android application as an intuitive user interface. This application allows users to adjust room temperature according to their preferences and monitor temperature data. Users also have the ability to remotely activate or deactivate the AC unit, ensuring energy-efficient usage.

By combining human detection technology, fuzzy logic, and Android application, the Room Air Conditioning Control System Design not only offers efficient and adaptive temperature control, accurate headcount calculation, but also real-time room temperature monitoring. Through comprehensive system design documentation, block diagrams, and detailed implementations, this system holds the potential for widespread implementation, catering to the need for improved room temperature control and achieving significant energy savings..

Keywords: room temperature control, fuzzy logic, human detection, Android app, energy savings