

CAPSTONE DESIGN 1

AI-POWERED SMART BUILDING AIR CONDITIONING CONTROL SYSTEM

PROJECT TEAM

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ROLES & RESPONSIBILITIES

- Concept and System Architecture development
- Frontend and Backend
- Development and IoT card ML
- Software organization
- Maintenance of model conditions
- Composition packaging, and tasks

PROJECT ADVISOR | PROF. CHO BYUNG-JIN

PROJECT BACKGROUND



1. HIGH ENERGY CONSUMPTION
Wasted energy on obsolete systems

2. INEFFICIENT CONTROL
Unresponsive to occupant needs (e.g., cooling empty rooms)

3. SMART SYSTEM CONTROL
Targeted efficiency (cooling only occupied zones)

Modern building designs face significant energy efficiency challenges, primarily due to inefficient control logic, like cooling empty rooms. AI-powered smart systems utilize predictive algorithms and

COMPARATIVE ANALYSIS

- High consumption
- Unstable temperature

AI SMART SYSTEM

- Low consumption
- Optimized environment

AI-powered smart systems utilize predictive algorithms and real-time occupancy data to drastically reduce wasted energy and improve comfort, creating sustainable and smart buildings.



METHODOLOGY



1. DATA COLLECTION

- Temperature
- Humidity
- Occupancy



2. AI MODEL ANALYSIS

- Deep Learning
- Predictive Control
- Optimization



3. REAL-TIME CONTROL

- Smart Valves
- Fan Speed Adjustment



4. OPTIMIZATION & MONITORING

- Cloud Dashboard
- Remote Management

PROJECT SCHEDULE & PLANNING

RESEARCH & DESIGN
Concept and System Architecture Design

SYSTEM DEVELOPMENT & TESTING
Frontend, Backend, and ML Development

DATA COLLECTION & MODEL TRAINING
Sensor Network Deployment and Training

DEPLOYMENT & DEMO
Final Showcase and Live Demo