Smart Cooling System with Real-Time Sensor Monitoring and AI-Driven Fan Control

Team Name: one - M

Team Members:

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Problem Statement:

High energy consumption in cooling systems demands smarter and more efficient solutions. Current cooling systems for data centers and industrial machines are energy-intensive, inefficient often leading to increased operational costs and environmental impact.

Solution Overview:

Our solution involves designing a smart cooling system that dynamically regulates temperature leveraging real-time data from sensors. The system will use an AI agent to analyze the data and adaptively control cooling elements such as fans and temperature settings, optimizing energy use and reducing costs.

Objectives:

1. Develop a hardware setup using Arduino with sensors to monitor temperature, humidity, and fan speed.
2. Implement a database using DataStax Astra to store real-time sensor data.
3. Create an AI agent using Langflow to analyze data and provide optimal cooling solutions.
4. Build a Python-based API to communicate between the AI agent and the Arduino, adjusting the cooling system accordingly.
5. Design an admin dashboard to monitor and control system components.
6. Re-think the design of the existing cooling systems used in data centers.

Technology/Tools to be Used:

1. Arduino (with temperature, humidity, and fan speed sensors)
2. DataStax Astra (for database management)
3. Langflow (for AI agent development)
4. Python (for API integration and dashboard creation)

Expected Outcomes/Impact:

1. An energy-efficient cooling system that reduces energy consumption and operational costs.
2. Improved performance and longevity of data center and industrial machine components.
3. Significant reduction in environmental impact through optimized energy use and inclusion of renewables whenever needed.

Challenges You Anticipate:

1. Integration of hardware components with the AI system.
2. Real-time data processing and decision-making by the AI agent.
3. Ensuring system stability and reliability under varying operational conditions.