

Conditional Monitoring of GPU

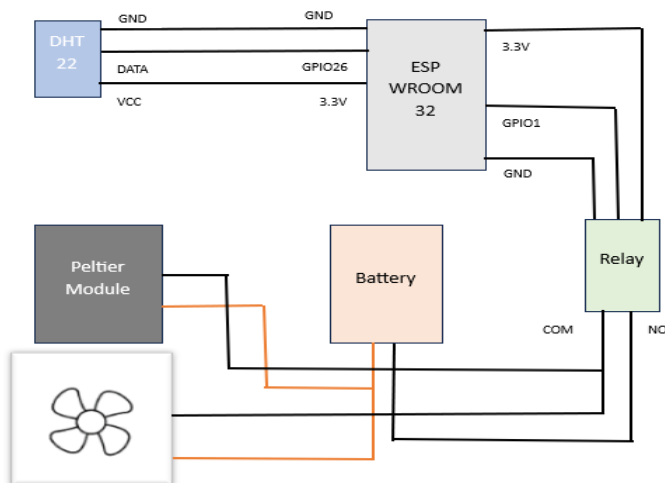
INTRODUCTION

As the demand for GPU-intensive applications continues to rise, so does the challenge of effectively managing heat in desktop computing environments. Conventional cooling solutions, like continuously running fans or static cooling pads, are often inefficient, consuming unnecessary power regardless of actual GPU workload. These outdated systems lack the intelligence to adapt to changing thermal conditions, leading to energy waste and potential thermal throttling. To overcome these limitations, this project introduces a smart, energy-efficient GPU cooling system powered by IoT technology. Utilizing components like the ESP32 microcontroller, DHT22 temperature sensor, Peltier module, relay, and fan, the system monitors GPU temperature in real time and activates cooling only when it's truly required. This targeted approach ensures better thermal regulation, reduces energy consumption, and extends the lifespan of the hardware through intelligent automation.

METHODOLOGY

- Temperature and humidity data are continuously collected using the DHT22 sensor.
- The ESP32 microcontroller processes this data and compares it against a preset threshold (e.g., 30°C).
- When the temperature exceeds the threshold, relay module is triggered to power the fan and Peltier module.
- Once the temperature drops below the limit, the system turns them off automatically.

ARCHITECTURE



MODULES

- Sensor Module: Captures real-time temperature and humidity using DHT22.

- Controller Module: Uses ESP32-WROOM for data processing and decision-making.
- Actuator Module: Relay switches the cooling devices ON/OFF based on logic.
- Cooling Module: Combines high-speed fan and Peltier unit for active thermal regulation.

WORKFLOW

