

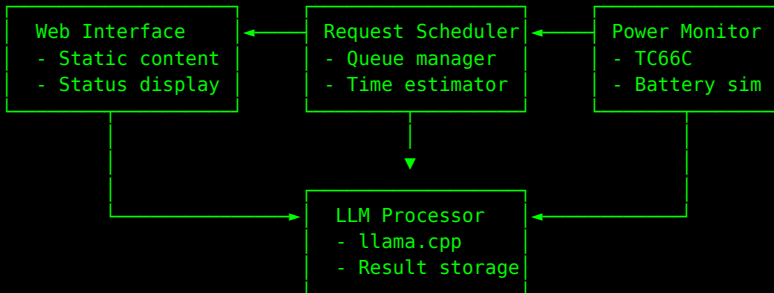
# A Design for a Multi-user Solar-Powered LLM System

an application of  
Delay-Tolerant Networking

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April 28, 2025

# System Architecture



## System Components

- ▶ Web Interface for user interaction
- ▶ Request Scheduler with power-aware processing
- ▶ LLM Processor using llama.cpp
- ▶ TC66C USB-C Power Monitor

# Features

## Implemented

- ▶ Power-Aware Scheduling
- ▶ Request Queuing
- ▶ Static Web Interface
- ▶ TC66 Power Monitoring
- ▶ Llama.cpp Integration

## Planned

- ▶ Weather Integration
- ▶ Integration with solar controller
- ▶ Data collection to tune and refine power estimates
- ▶ Common prompt caching

Accept requests during low-power periods - queue requests and process when energy is available.

# Hardware Implementation

## Equipment

- ▶ Solar panel setup (simulated)
- ▶ TC66C USB power monitor
- ▶ Battery system (simulated)
- ▶ Low-power LLM optimization

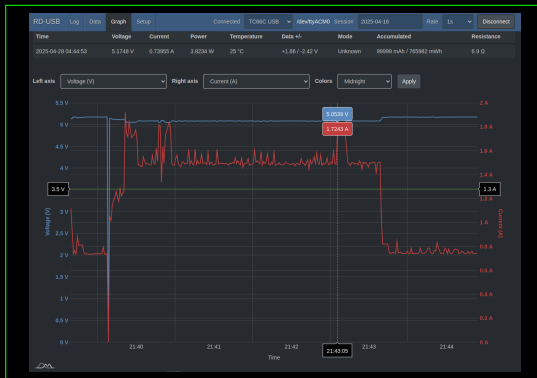


SBC (RPI 4 8GB)

# Power Management

Battery Level:

[|||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||] 85%



RD-USB Power Monitor

# Live Demo

Access the System Demo

<https://dtnllm.mattburns.info/>

# References



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