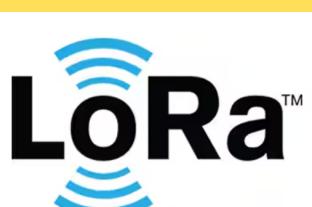


Designing an IoT System with 3 nodes for data collection via LoRa network

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College Student: Tran Lam Tuan Dat - Nguyen Duong Duc Tai



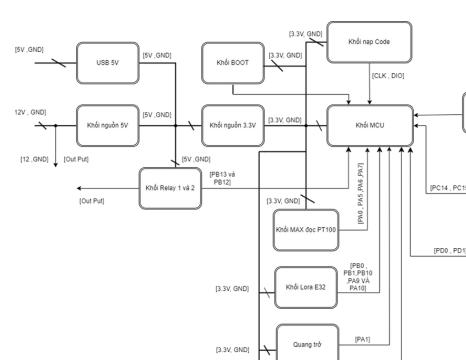
INTRODUCTION

The IoT system with 3 nodes collecting data via LoRa network enables monitoring of soil moisture, air temperature, and surrounding environmental sensors. Utilizing the LoRa network, the system transmits data over long distances without consuming excessive energy. The three nodes are employed to gather detailed data about the dragon fruit plants and their surroundings. The system ensures continuous and accurate data collection. The data is sent to a control center for analysis and display through a user-friendly interface. It helps save energy, money, and reduces risks in plant management. This IoT system brings utility and efficiency in caring for and monitoring plant growth.

GOALS

- Design an IoT system with 3 nodes that collect sensor data and then send sensor data to the gateway
- Utilizing the LoRa network for data transmission and reception
- Implementing data routing among the nodes
- Creating a simple user interface for website design.

Circuit Design NODE



The principle circuit block diagram

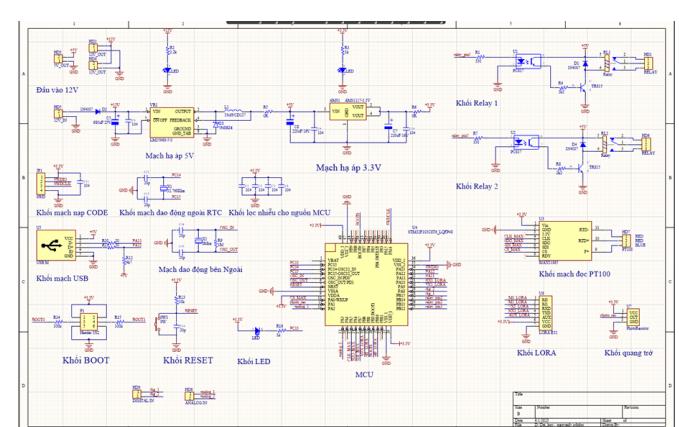


Figure 6 principle diagram

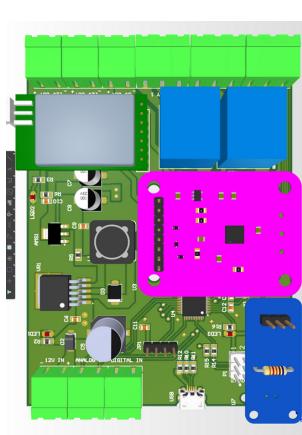


Figure 7 3D drawing

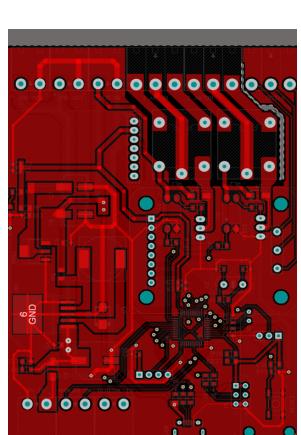


Figure 8 Layout NODE drawing

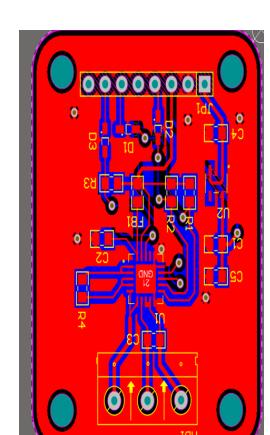


Figure 9 Layout read temperature sensor drawing

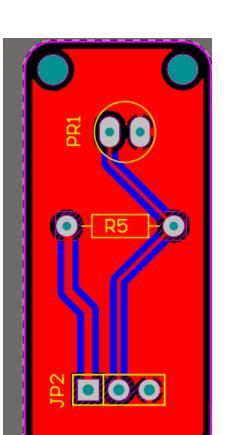


Figure 10 Layout photoresistor



Figure 11 NODE 1

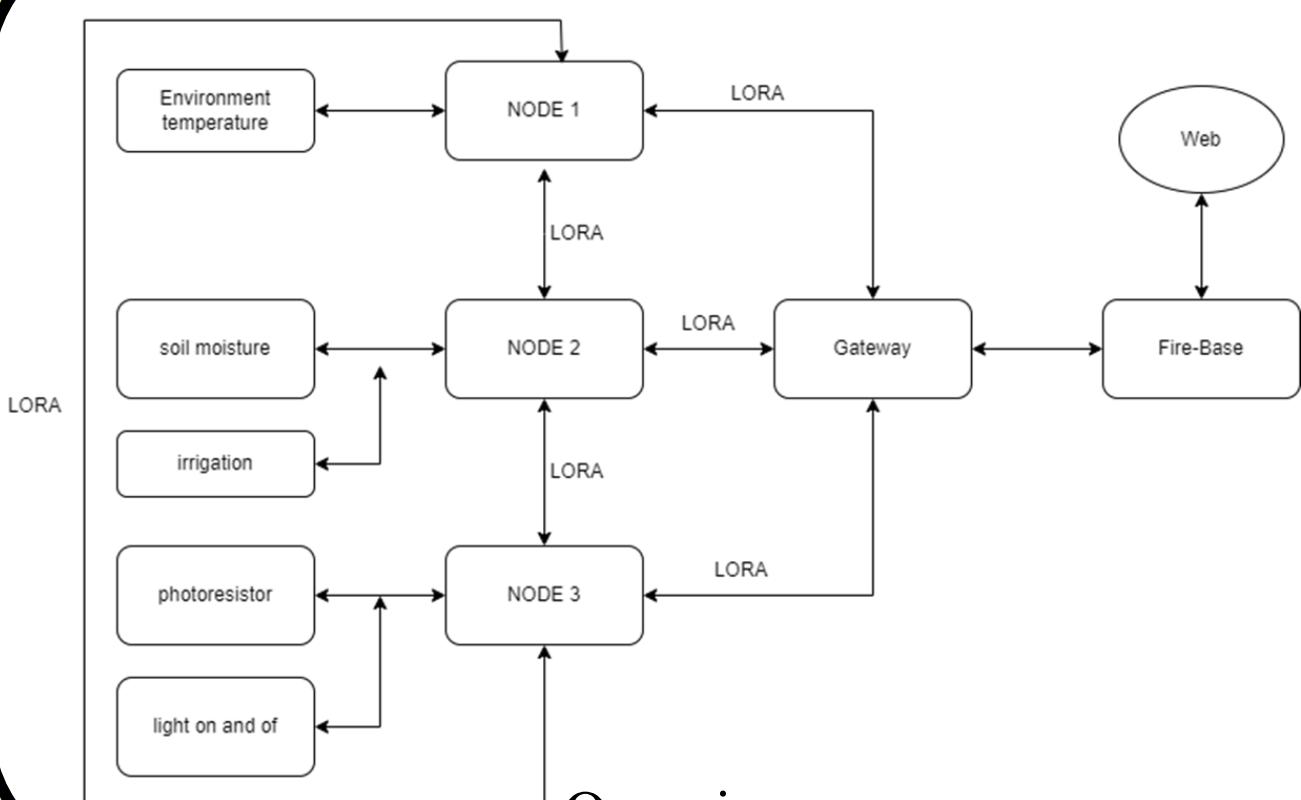


Figure 12 NODE 3



Figure 13 NODE 2

SYSTEM BLOCK CHART



Overview map

USER INTERFACE

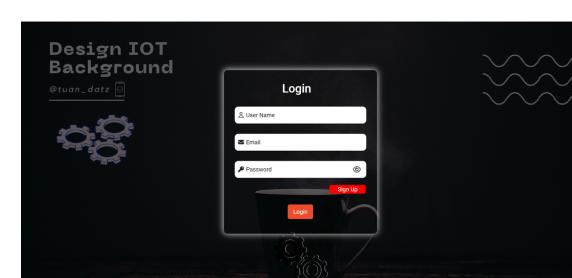


Figure 1 Login website interface

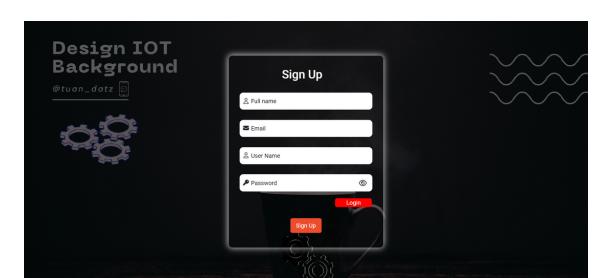


Figure 2 Sign Up website interface

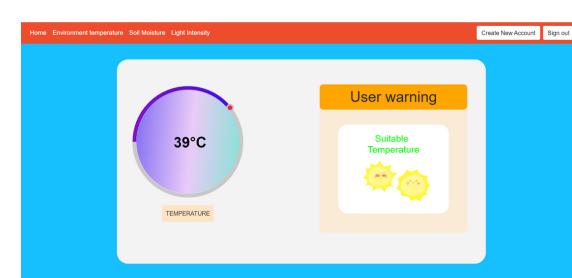


Figure 3 Node 1 website interface

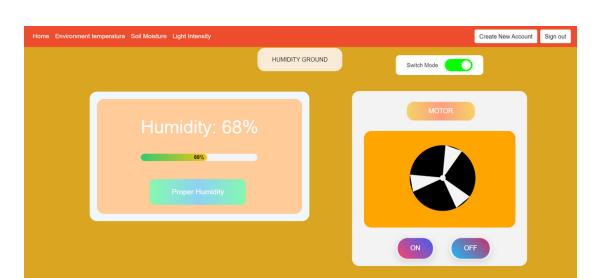


Figure 4 Node 2 website interface

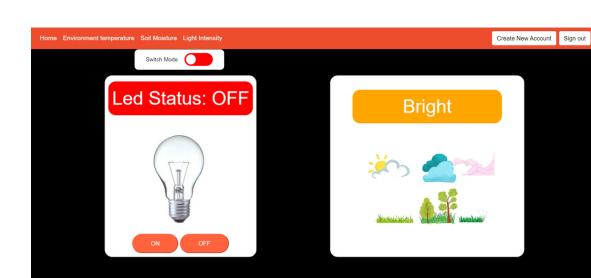


Figure 5 Node 3 website interface

Gateway

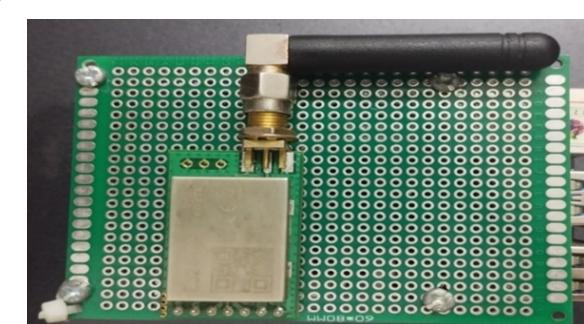


Figure 14 Gateway

Using Raspberry Pi 4 with Lora E32 as a gateway serves as an intermediary between IoT nodes and a website. Its function is to receive data from various nodes and classify the data based on the source node before transmitting it to the website

Conclusions

- Design IOT nodes to read sensor data
- Apply lora technology to data transmission
- Apply lora mesh to routing data packets
- Nodes can transmit and receive data in urban areas up to 100m-200m
- Design websites for users

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