Plantainer

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Team 12

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Introduction

Team 12 has designed an automated system that delivers light and water to small plants with a focus on data collection. The goal of the project was to build a system that provides useful data to the customer about their plant and requires minimal input from the user. The main focuses of the design are automated lighting and watering, data collection, capturing pictures of the plant, and an external user interface that presents data to the user. This piece summarizes the nature of the project's proposed design including methods of testing, product research, design choice and parts, and overall cost estimates.

Hardware

To enable the design an electrical system is required. To achieve Plantainer's goal the hardware schematic below is used. Using a laptop power supply voltage is provided and adjusted by DC-DC converters. Enabling every part of our design. To provide specific voltages to higher voltage components transistor switches are used.
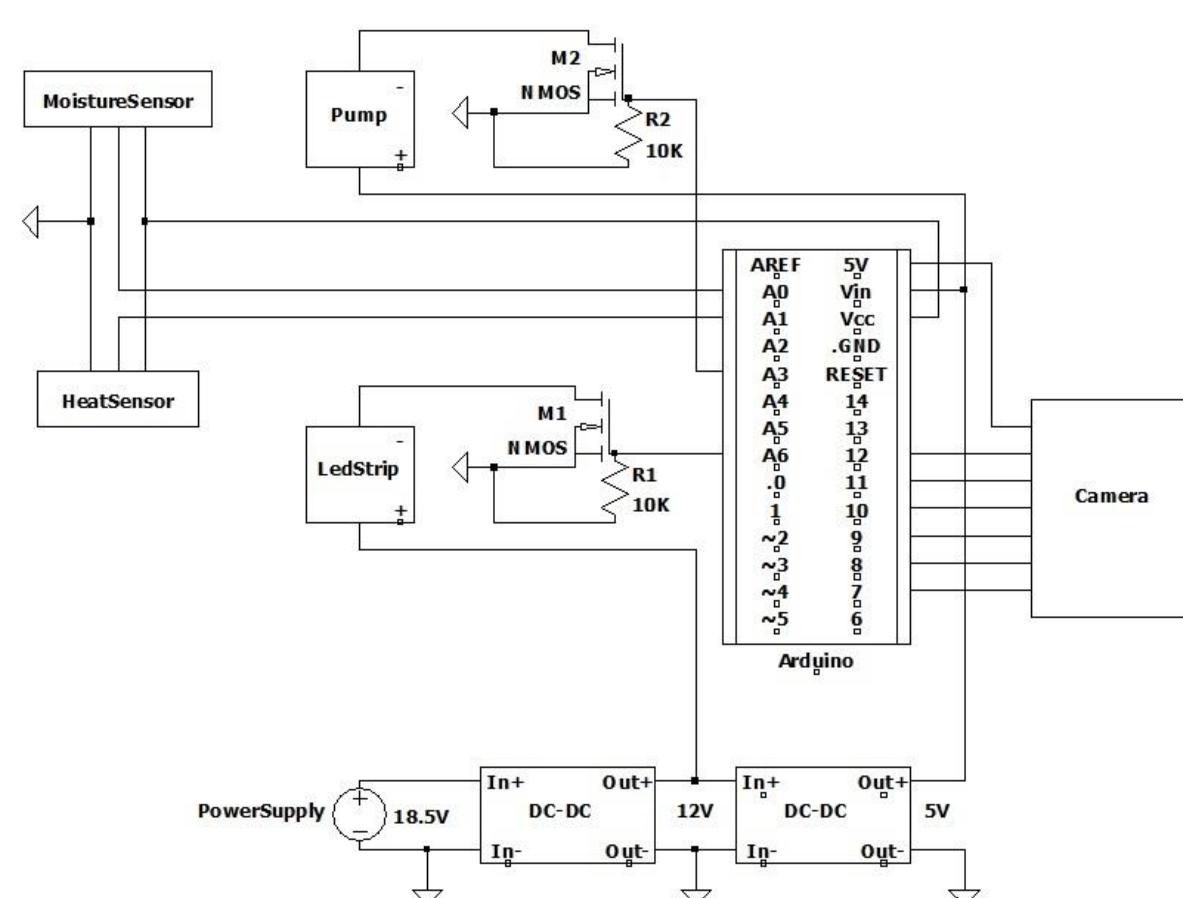
Hardware configurations of product

Software

Arduino IoT Cloud

The Arduino IoT platform is a reliable and powerful platform that enables seamless integration of hardware and software. The Arduino MKR 1010, is an excellent choice for this. The board is specifically designed for IoT applications and provides a range of features that make it an ideal choice for your project. For example, it includes built-in Wi-Fi and BLE connectivity, as well as a secure element for storing sensitive data. It also has low power consumption, which is essential for IoT devices that may need to run for extended periods of time. By using the Arduino IoT platform and the MKR 1010 board, Team 12 was able to easily connect the hardware to the internet and integrate it with the software. This enables the product to collect and transmit data, as well as respond to commands and interact with other devices and services.

Automation

To enable the microcontroller to switch on the LED for a specific time and turn on the pump to water plants at given intervals Team 12 developed code for the Arduino. The code uses timer interrupts to keep track of the time and turn on the LED and pump as needed. With this code, the Arduino is able to autonomously control the LED and pump, making it a great solution for automating plant watering systems.
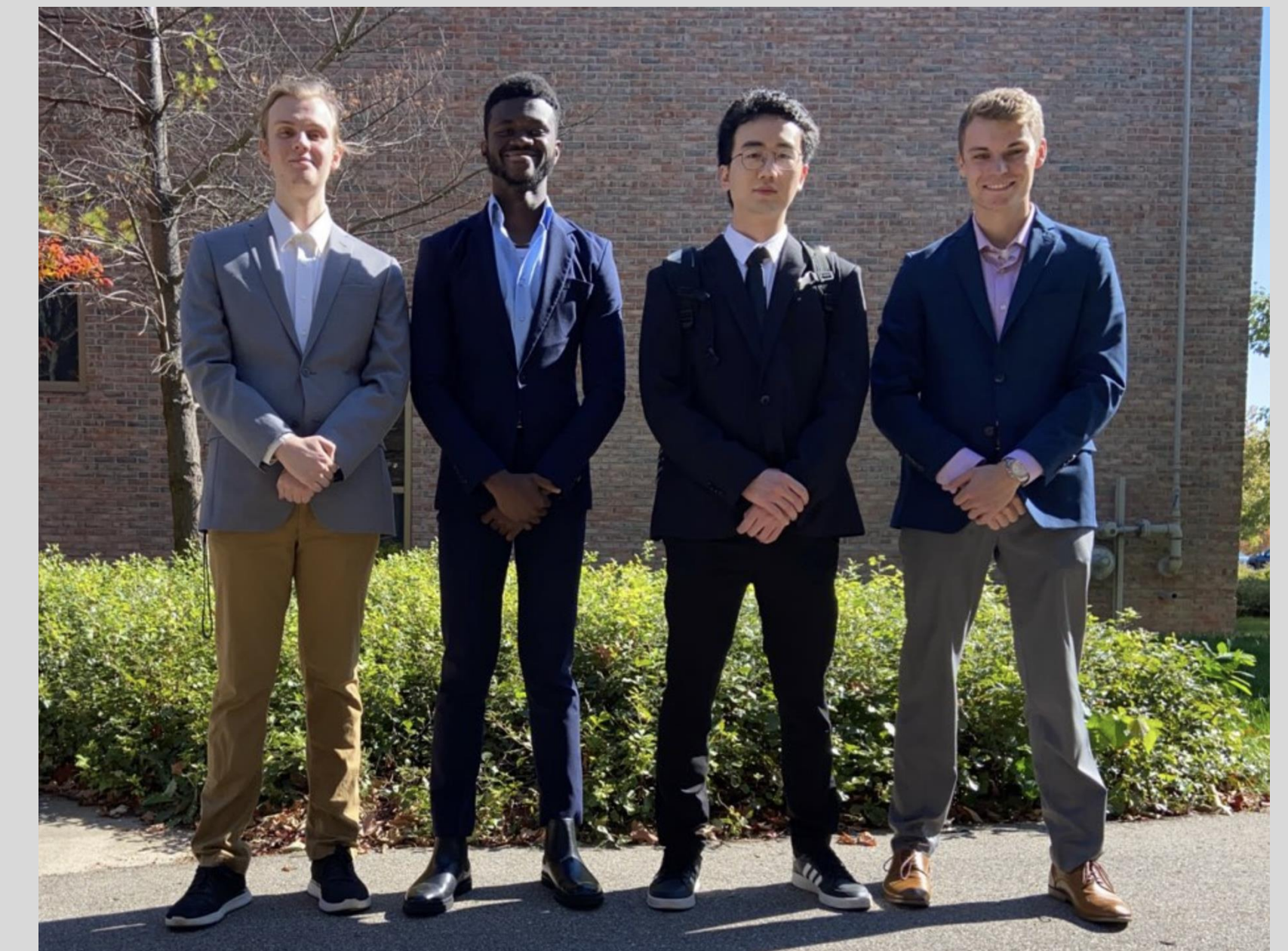
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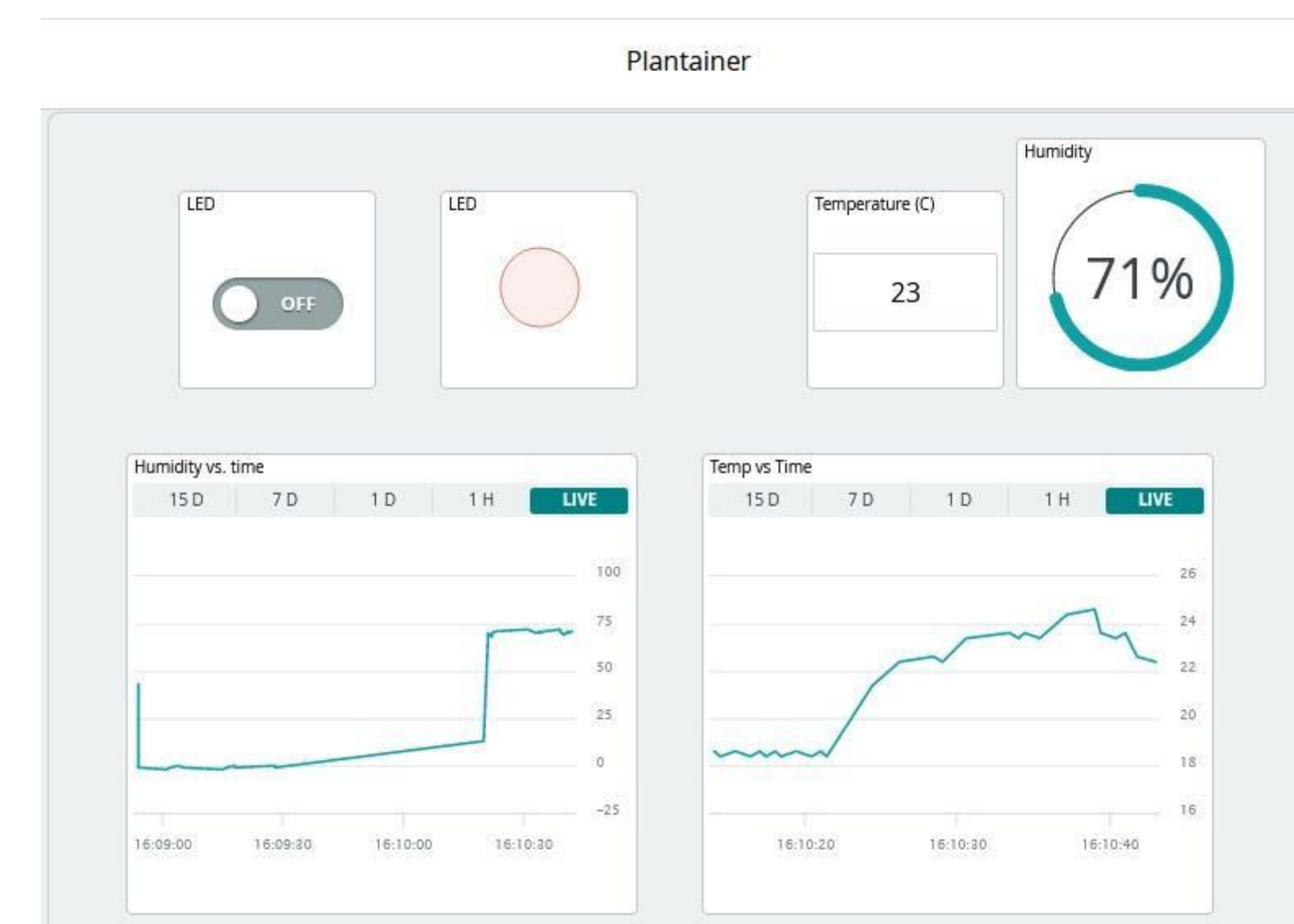
User Interface on Arduino IoT Cloud

Container Design

From left to right: Eric Brouwer(EE), Omari Nyarko(EE), Haocheng Jin (EE), Jaden Vanderwerff (EE)

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