Self Watering System

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Project Description

System that keeps the soil at a constant level, as well as monitor the ambient temperature and humidity around the plants. The data is displayed in a mobile friendly web interface.

Goals

- Learn how to control sensors with code.
- Learn how to work with raspberry pi’s strictly with command line.
- Learn about new hardware (relay, PCF8591 converter).
- Work efficiently and effectively in a group to develop a large project.
- GitHub.

Components

Raspberry Pi 3

Sqlite3 database

Moisture sensor

DHT humidity sensor

Temperature probe

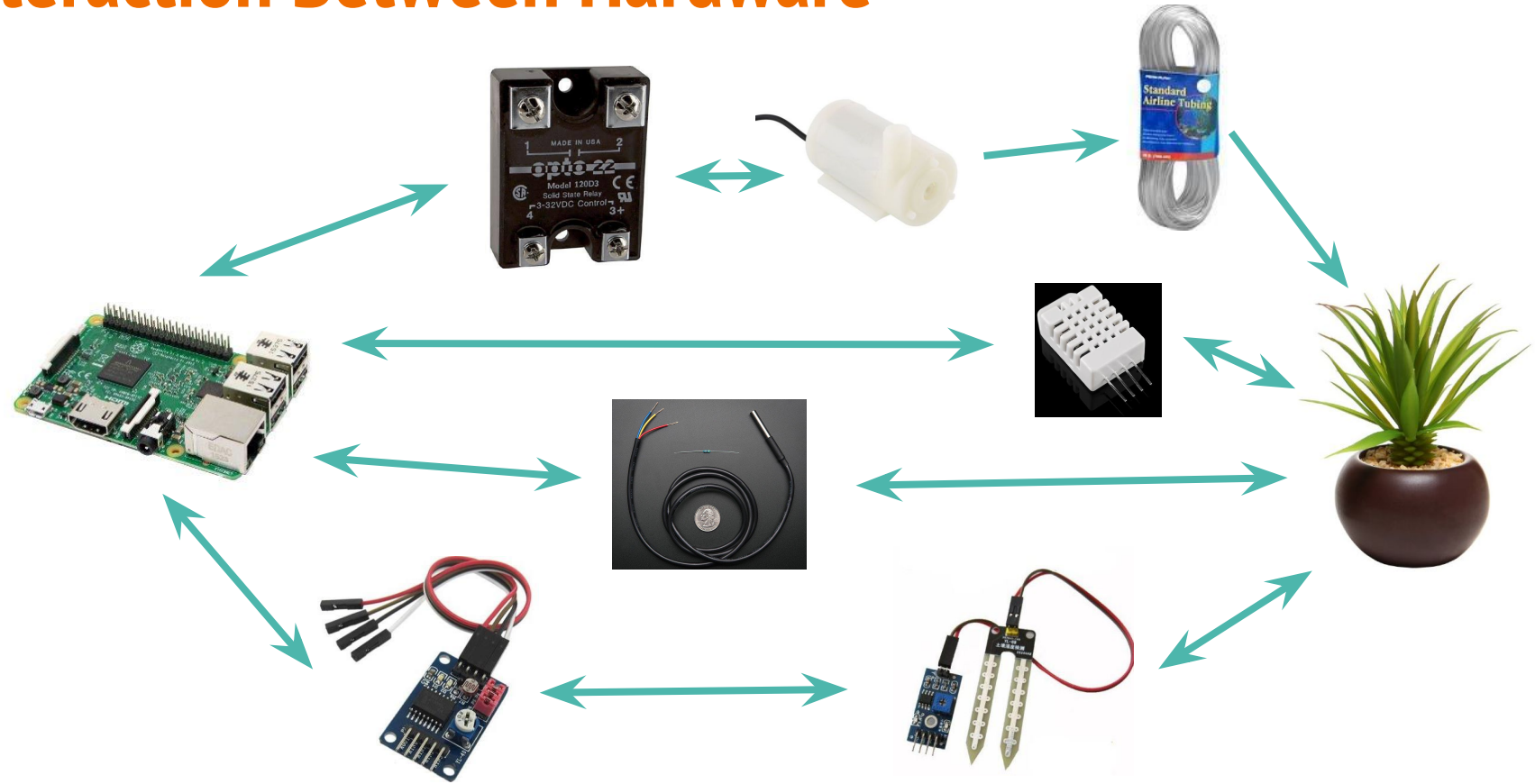
Relay (opto 22)

Motor

Tubing

Flask (python framework)

Interaction Between Hardware

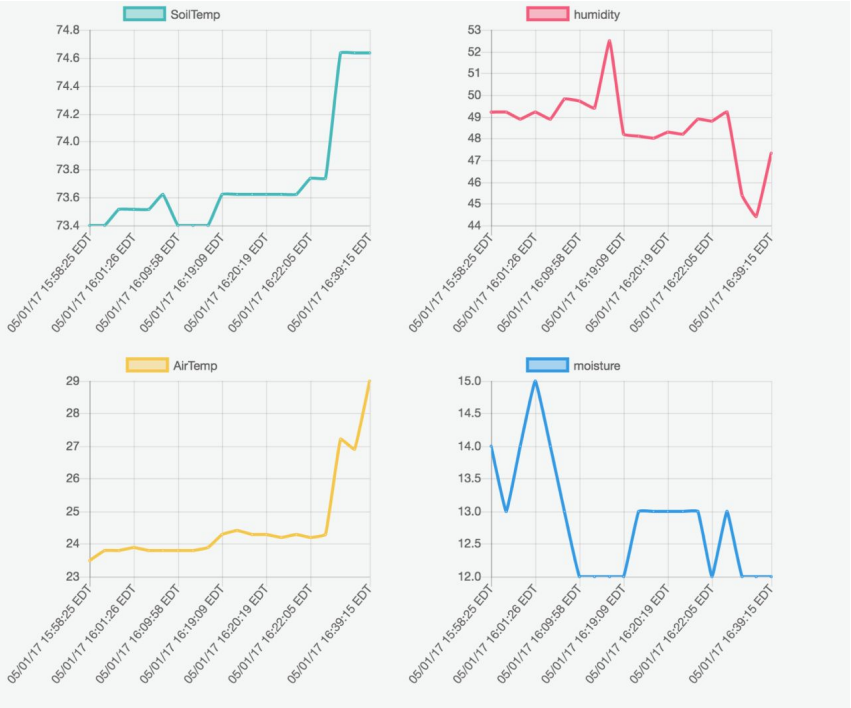


Pseudo

```
Main:
        Calls LogData()
        Sleeps(hours)
LogData:
        Calls each function and stores the return values
        Records all info in DB
TempSensor:
        Reads and returns value from temp sensor
HumiditySensor:
        Reads and returns values from humidity sensor
MoistureSensor:
        Reads and returns value from moisture sensor
WaterPump(moisture results passed):
        if(moisture results <= threshold)
                Supply power to motor
                Sleep(seconds)
                Remove power from motor
                Return 1
        Else
                Return 0
```

Web

Time stamp	Soil Temp	Humidity	Air Temp	Moisture	Pump Status
05/01/17 15:58:25 EDT	73.40	49.20	23.50	14.0%	1
05/01/17 15:58:36 EDT	73.40	49.20	23.80	13.0%	0
05/01/17 16:01:12 EDT	73.51	48.90	23.80	14.0%	1
05/01/17 16:01:26 EDT	73.51	49.20	23.90	15.0%	1
05/01/17 16:02:48 EDT	73.51	48.90	23.80	14.0%	1
05/01/17 16:05:02 EDT	73.62	49.80	23.80	13.0%	0
05/01/17 16:09:58 EDT	73.40	49.70	23.80	12.0%	0
05/01/17 16:10:10 EDT	73.40	49.40	23.80	12.0%	0
05/01/17 16:10:21 EDT	73.40	52.50	23.90	12.0%	0
05/01/17 16:19:09 EDT	73.62	48.20	24.30	12.0%	0
05/01/17 16:19:23 EDT	73.62	48.10	24.40	13.0%	0
05/01/17 16:20:07 EDT	73.62	48.00	24.30	13.0%	0
05/01/17 16:20:19 EDT	73.62	48.30	24.30	13.0%	0
05/01/17 16:21:42 EDT	73.62	48.20	24.20	13.0%	0
05/01/17 16:21:54 EDT	73.62	48.90	24.30	13.0%	0



Challenges

Time

Moisture sensor

- Needed to use a converter to get a digital signal

Water Pump

- Needed a relay in order to control current

Future Improvements

- Convert the web interface hosted on the pi to a mobile app
- Create multiple plants per user(require more pi’s and sensors)
- Graphics to display the data on web

Demo