System setup cress.space

Team cress.space

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1. Setup

The environment for the cress is controlled by various factors that can be manipulated by actors. The information about the current state of the environment is collected by sensors. All those actors and sensors are managed by a Raspberry Pi device which is controlled by an API accessible from the web. See figure 1 for illustration.

The actors and sensors are as following.

433MHz Transmitter	
DHT 22	Get Temperature and humidity.
White LEDs	Light for elumination at night.
Pump 1	Pump to transfer water to the cress.
Pump 2	Pump to transfer water back to the water supply tank.
Pelier Elements	Change temperature of the environment.
Water Level	Get water level.

The according webpage is `https://cress.space/`. Information about the environment is provided here. By voting users can decide which actions should be taken to modify the environment in which the cress is in.

Push-Request. Every 10 minutes the UV light is turned off while the LEDs are turned on. Then a picture is taken, which gets pushed to the API together with collected sensor data.

Pull-Request. The parameters are determined by voting on the webpage. Then they they are sent to the Raspberry Pi device, which in turn apply them to the available actors to manipolate the environment for the cress.

A. Scripts

In `functions.sh` all the necessary shell functions are defined. The functions are

`SwitchPumpOn`	Turn on the water pump.
`SwitchPumpOff`	Turn off the water pump.
`SwitchUVOn`	Turn on the UV light.
`SwitchUVOff`	Turn off the UV light.
`SwitchLEDOn`	Turn on the white LED light.
`SwitchLEDOff`	Turn off the white LED light.
`PushSensorData`	Send data to API.

The script `oneshot.sh` is called periodically via `crontab` and implements one single data transfer cycle between API and Raspberry Pi.

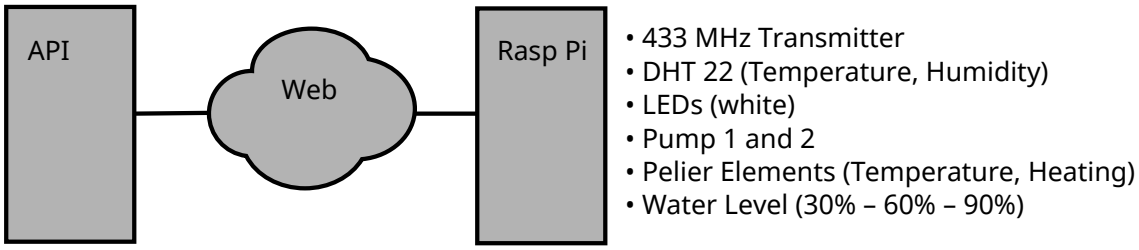

Figure 1: Setup for cress.space