

## **Documentation**

Team Bonsai

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### **Team members**

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### **Introduction**

With our IoT device, growing plants in an optimal way shall be simplified and improved. The user should be able to control multiple “growing stations” via a single device wherever he is located at the time.

Each “growing station” is connected wirelessly to one external server where also external temperature sensors are connected to.

### **Concept description**

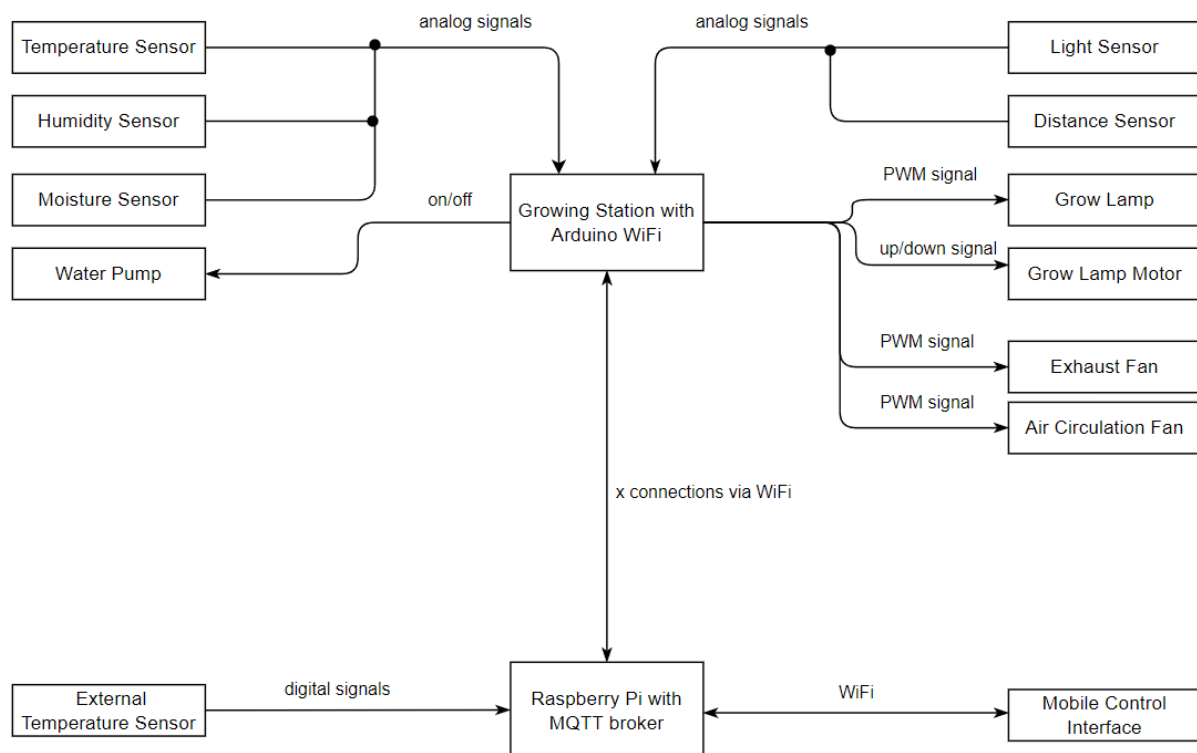
Growing plants is mostly easy, but it can be a hard time to master.

Every plant has different needs for light, nutrition and water. As a medium interested user, keeping track of all those variables can be difficult. Specifically with multiple plants in multiple “growing stations”.

Therefore, every station is equipped with temperature, humidity, moisture, light and distance sensors.

Depending on the temperature and humidity sensor, exhaust and air circulation fans are controlled. The moisture sensor will trigger water pumps for watering the plants and the light sensor will control the growing lamps, depending on already receiving light from outside and the distance between lamp and plant.

At some points in the growing stage of a plant, the growing lamp has to cover a larger surface area or needs to go higher to prevent the lamp from burning the plant and requires the motor, that can control the height of the lamp, to increase the distance between lamp and plant and brightening the light to archive equal light intensity as before.



Picture 1: Block diagram of our project.

## Project/Team management

*Which project methods you used in your project?*

*Breakdown: How you managed your tasks?*

*What are the different tasks/roles of the team members in the project?*

*Describe which team member did which tasks.*

We will be following the Agile Methodology. We will have weekly Agile Sprints. In the beginning of each sprint we will have sections dedicated to planning, design, coding and analysis. Initially, the team gathers together, physically or online, to have a brainstorming session. We discuss ideas to solve the problem, note down the requirements of the task ahead, adjust and incorporate our ideas to solve the aforementioned problem. An analysis is carried out to determine if our work is in line with the requirements. This is an iterative process and it is quite normal for us to restart our work if we have no productive outcomes. The tasks are split evenly amongst 3 members.

## Technologies

We use together with the Arduino WiFi and a Raspberry Pi the X-40 Sensor kit.

For communication we use WiFi, as it is easy to implement, broadly used and it is the technology that is supported by the Arduino.

Furthermore we will use  $\mu$ C for programming the Arduino and C or maybe Python on the Raspberry Pi side.

## Implementation

*Describe the static structure of the environment.*

*Provide a class diagram for this purpose and briefly explain the classes or modules.*

*Describe the use case(s) of your environment*

## **Use Case**

*Give instructions on how to use your application. Potentially using an/more example(s), figures, screenshots etc.*

## **Sources/References**

*Provide the sources on the technologies and algorithms you used in your project (Github).*