

EESTECH Challenge | Human-Computer-Interaction | Local Round Duisburg

Concept Presentation Team LF

14. October 2020 | Fabian Mantica, Julian Weber, Sebastian Tenkamp
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Persona

Persona

People
with busy
schedules

People with
limited
knowledge
in botanics

Allotment
owners

Florists

Reasons to use and buy our product

To compensate
shortcomings in
your knowledge
of botanics

To be able to have
plants in your
home, even if you
don't have time to
tend to them

Personality

- busy

- protectiv
- caring

Interests

- Micro farming
- hobby florists
-(turning a profit)

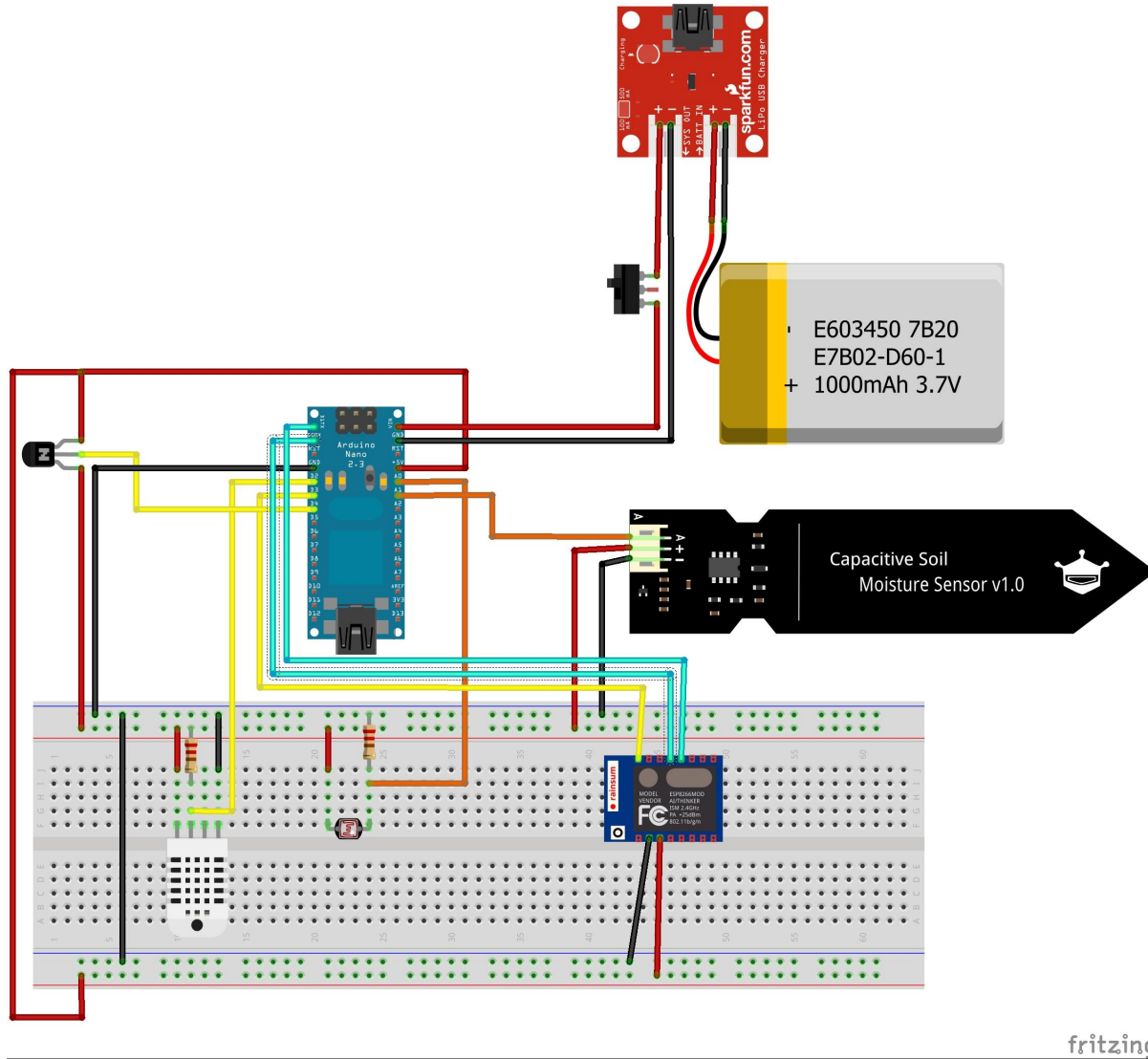
Skills

Being able
to use a
phone
application

Tech saviness

Minimal
requirements

Hardware



- Arduino Nano Board
- Capacitive Soil Moisture Sensor
- Temperature and humidity sensor
- Photoresistor
- Wifi-Modul
- USB LiPoly Charger
- Lithium Polymer Battery
- Cable, On-Off-Switch, Resistor, NPN-Transistor

➤ All shown parts are planned to be on one specific made custom PCB and put into a housing

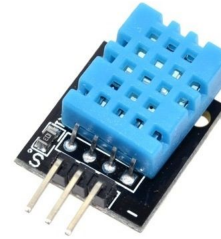
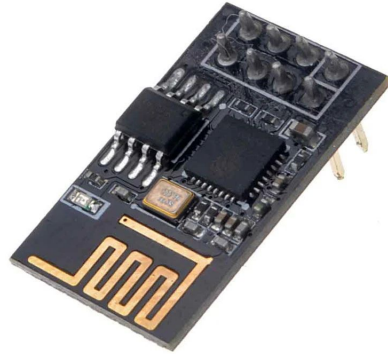


Possible housing solution

source:

<https://labeuker.nl/home-automation/mi-flora-in-home-assistant/>

Sensors/Modules



Capacitive Soil Moisture Sensor

- used to measure moisture level of soil (0 - 100%)
- better than non capacitive moisture sensors:
no *corrosion*, no *false values* with fertilizer
- only uses one analog input

ESP8266 WiFi-Module

- used to set up device and connect to the internet
- most known WiFi-module for use with mikrocontrollers
- reliable connection
- very power efficient

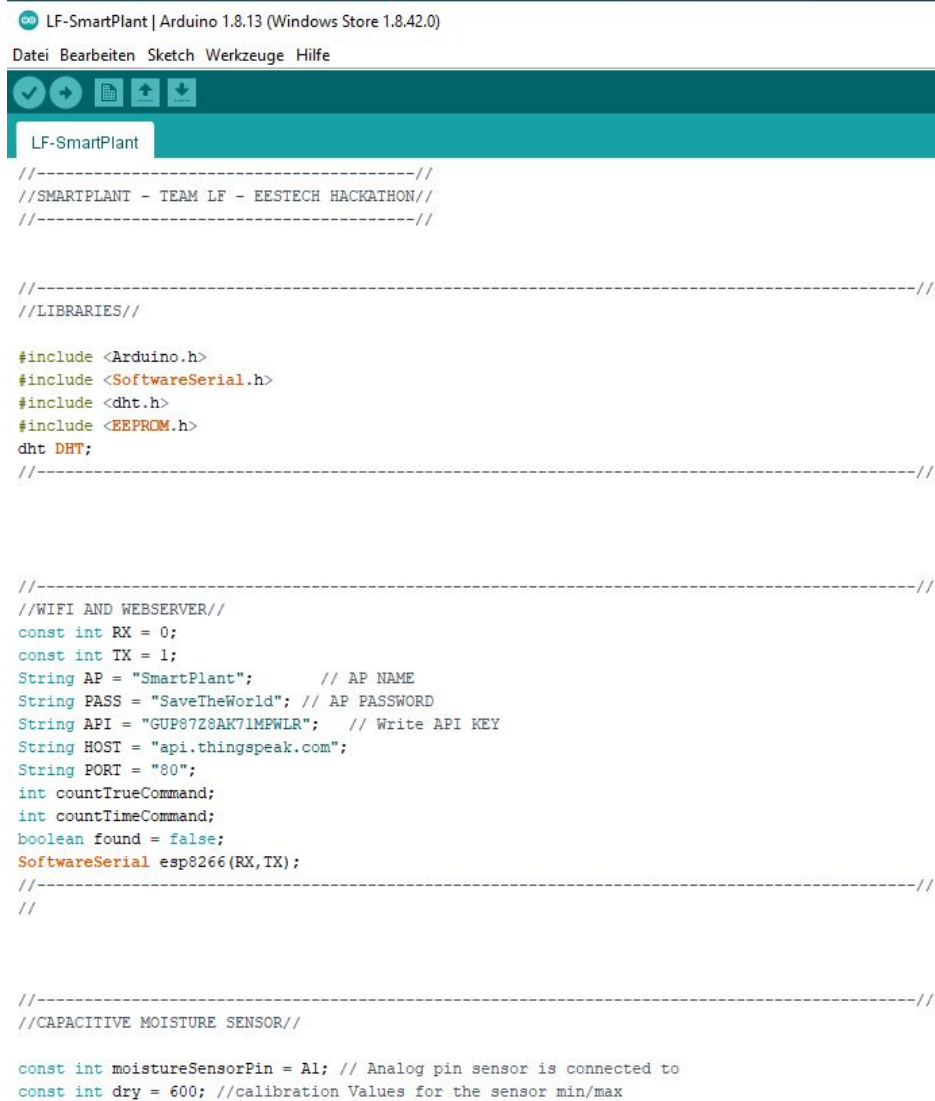
Temp. and Humidity Sensor (DHT11)

- used to measure air humidity and temperature
- sufficient measuring range for home use:
temp: 0 - 50 degrees Celsius
humidity: 20 - 80%
- small and cheap

Photoresistor

- used to measure light level with variable resistance as indicator for light exposure
- simple, reliable, small and cheap

Software



```
LF-SmartPlant | Arduino 1.8.13 (Windows Store 1.8.42.0)
Datei Bearbeiten Sketch Werkzeuge Hilfe

//-----//
//SMARTPLANT - TEAM LF - EESTECH HACKATHON//
//-----//

//-----//
//LIBRARIES//

#include <Arduino.h>
#include <SoftwareSerial.h>
#include <dht.h>
#include <EEPROM.h>
dht DHT;
//-----//

//-----//
//WIFI AND WEBSERVER//
const int RX = 0;
const int TX = 1;
String AP = "SmartPlant"; // AP NAME
String PASS = "SaveTheWorld"; // AP PASSWORD
String API = "GUP87Z8AK71MPWLR"; // Write API KEY
String HOST = "api.thingspeak.com";
String PORT = "80";
int countTrueCommand;
int countTimeCommand;
boolean found = false;
SoftwareSerial esp8266(RX, TX);
//-----//
//

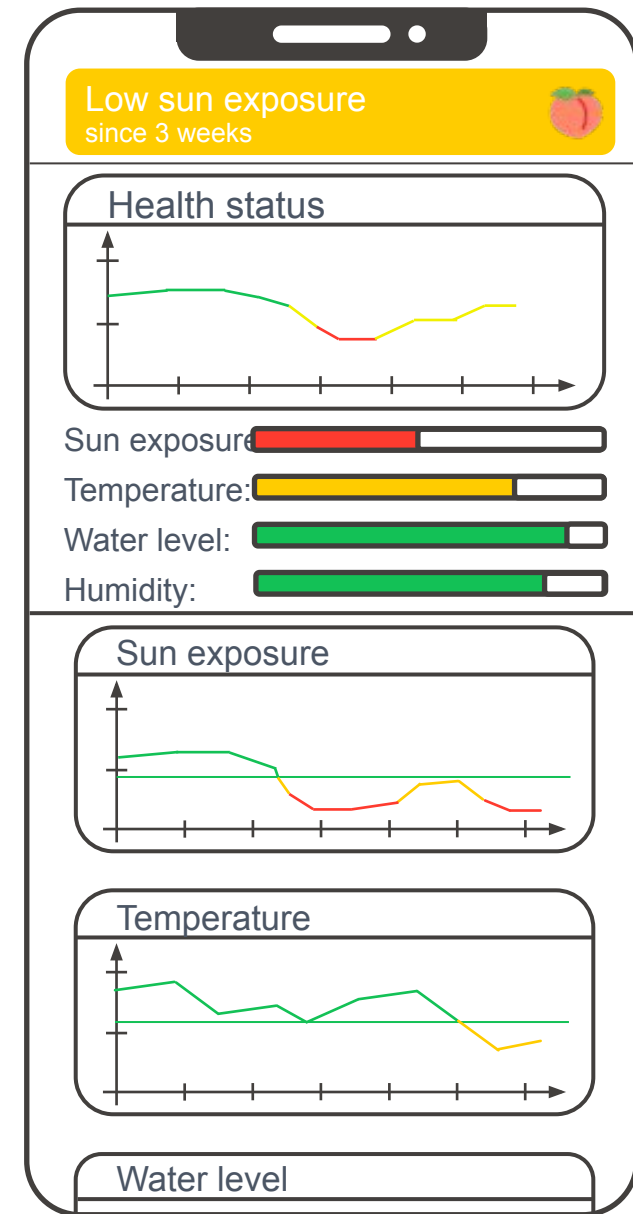
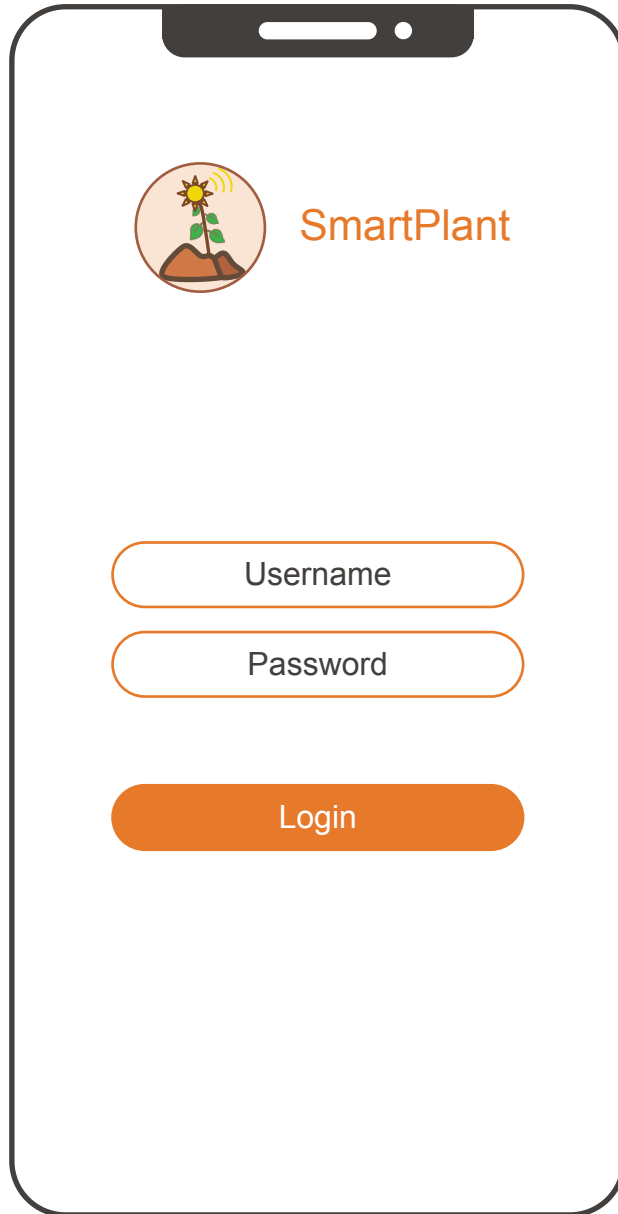
//-----//
//CAPACITIVE MOISTURE SENSOR//

const int moistureSensorPin = A1; // Analog pin sensor is connected to
const int dry = 600; //calibration Values for the sensor min/max
```


- mikrocontroller code written with Arduino IDE
- code offers WiFi connection for first time configuration
- permanent connection to the internet after configuration
- sensor values are read every few minutes and then send to a online database (thingspeak.com) automatically
- a smartphone App (not developed yet) is receiving the data and evaluates the values
- depending on plant type which can be chosen from a library, the user gets information about the health status of the plant
- if the status is bad he gets a recommendation what to do best to improve the health status (e.g. watering, put to a place with more light)



Smartphone App



Smartphone App

Plum

Sun exposure:

130

-

+

250

Temperature:

10

-

+

38

Moisture:

200

-

+

500


Humidity:


65


-

+

80

Plum (Prunus domestica)



Funkia

Sun exposure:

20

-

+

170

Temperature:

5

-

+

30

Moisture:

200

-

+

500


Humidity:


65

-

+

80

Funkia (Hosta)



Future

App Development



SmartPlant

- expand database
- userbased algorithms to suggest parameters

Add-Ons

- offer various add-ons like self-watering feature in a soft- and hardware bundle
- internet connection over mobile network as add-on

Community Support