

# Smart Agricultural System

## Microcontroller Architecture and Organisation

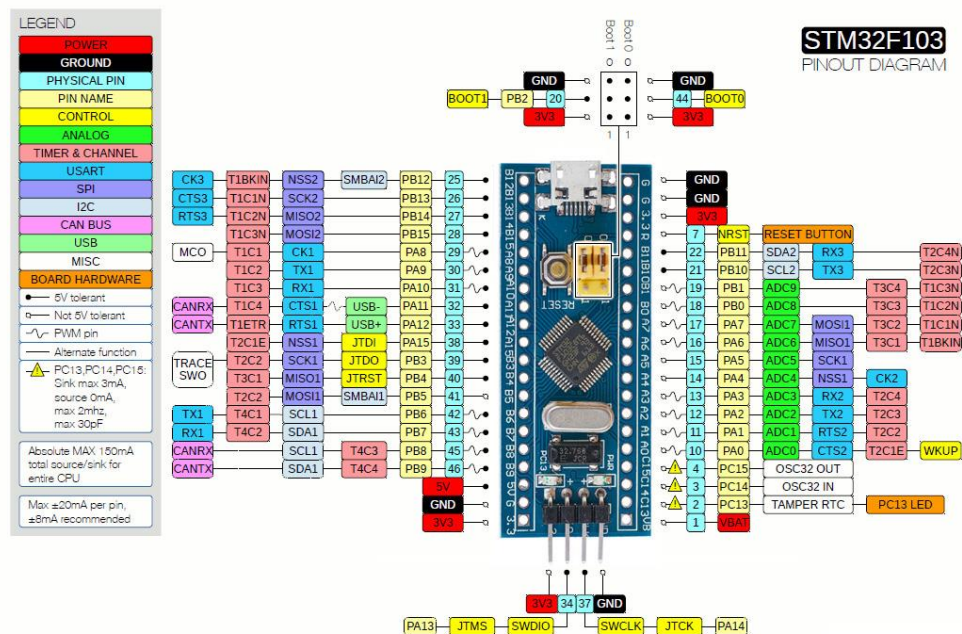
ECE5042

### Abstract

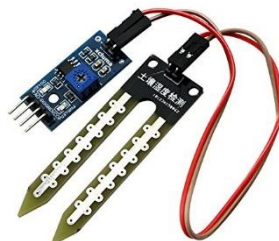
The Scope of the project I to use an ARM processor and Rust Lang to build a smart agricultural system for automation of water pumps and lighting along with temperature and humidity monitoring.

### Hardware

#### 1. STM32F103 “Blue Pill”



- 
- <https://www.st.com/en/microcontrollers-microprocessors/stm32f103.html>
- Program the board with [STLINK](#)



#### 2. Soil Moisture Sensor

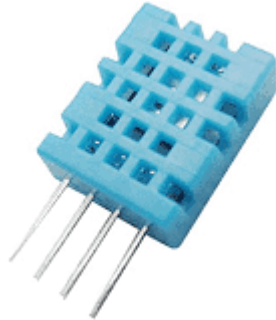
- [Link to Buy](#)

### 3. Relay to Control Pumps



- a. [Link to BUY](#)

### 4. DHT 11 for temperature and humidity



- a.

## Software

Most of the open source software's documentation is very verbose. Don't be afraid of it. Embrace it. You may have to do a lot of reading, but it will have all the information you need.

1. GDB - <https://www.gnu.org/software/gdb/>
  - a. We will use GDB as backend to OpenOCD to debug our code while it runs on the STM32
2. OpenOCD - <http://openocd.org/>
  - a. OpenOCD is an On-Chip Debugger that runs the code only on RAM and helps you map bin file to the actual code so you know where the problem is when running the code on the processor
3. Rust - <https://www.rust-lang.org/learn/get-started>
4. Rust Embedded Book - <https://rust-embedded.github.io/book/>
5. Awesome Curation of Embedded HAL Libraries for Rust - <https://github.com/rust-embedded/awesome-embedded-rust>
6. Sample code for reading data from DHT11/22 with Rust on STM32F0  
<https://github.com/michaelbeaumont/dht-sensor/blob/master/examples/stm32f042.rs>