User Manual

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User Manual - Version 3

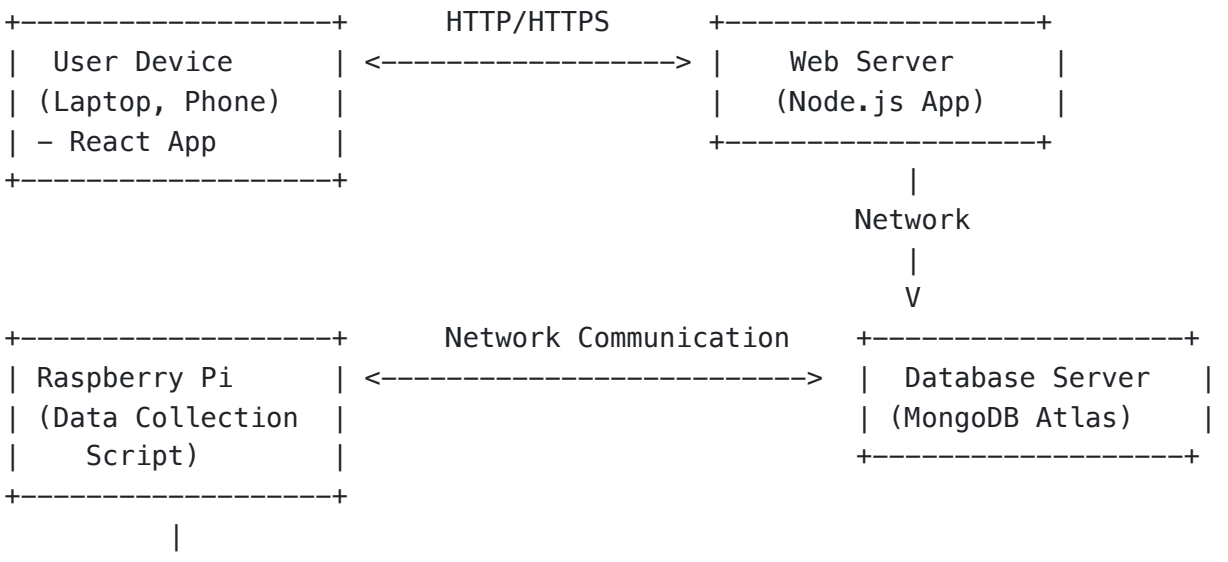
1. Introduction

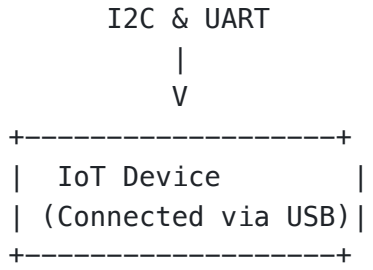
Welcome to the IoT Device Data Retrieval System!

This system is designed to help you monitor and manage your IoT devices effortlessly. By connecting your IoT device to our system, you can automatically retrieve crucial information such as firmware version, chip model, and voltage levels. This data is then securely uploaded to our website, where you can view it, analyze it, and download it for further use.

Whether you're a tech enthusiast or simply someone who needs to keep track of their devices, our system makes the process easy and straightforward. You don't need to be a technical expert—our user-friendly interface and automated processes handle everything for you.

Below is a very simple UML Deployment Diagram of our system:



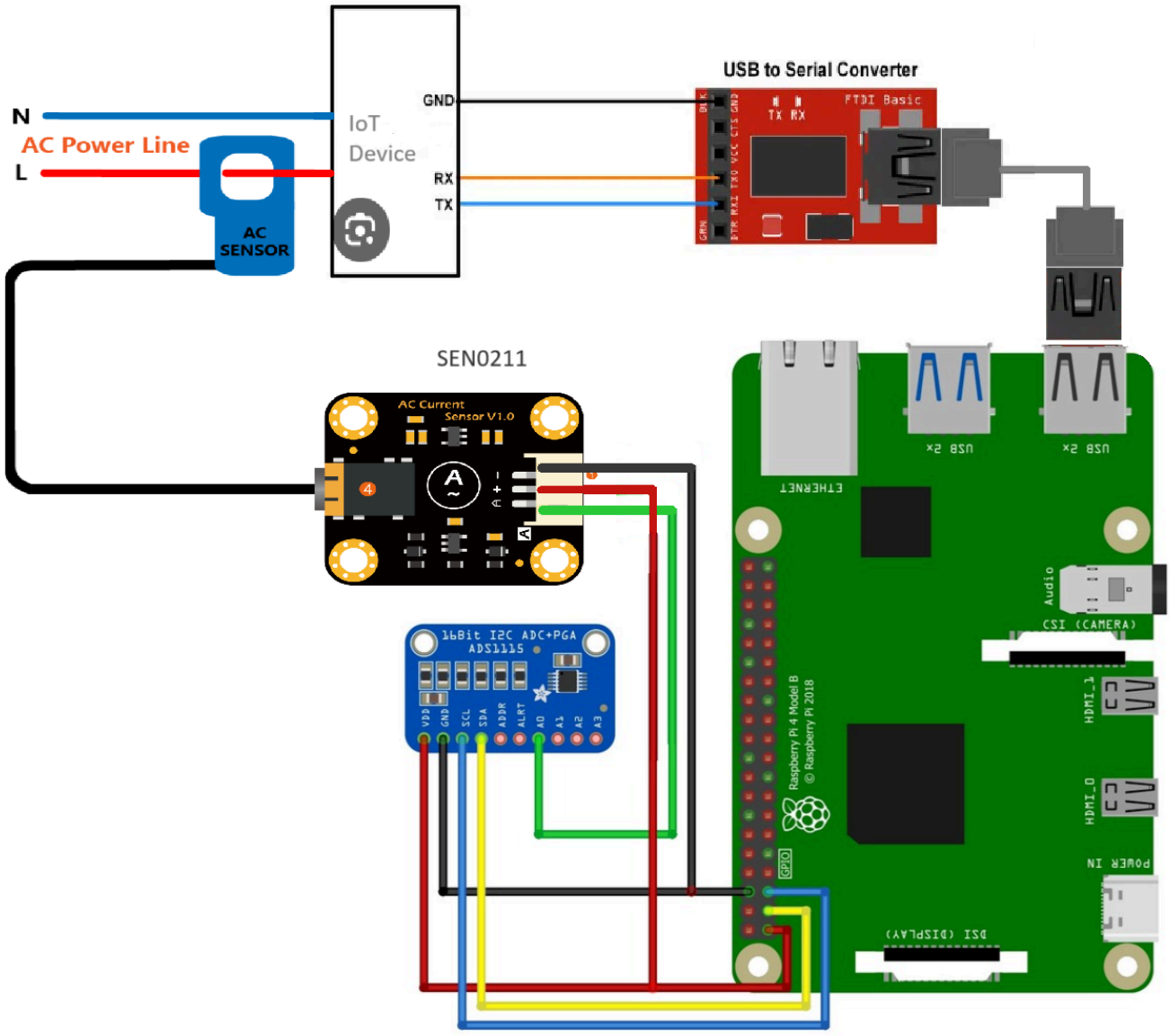


2. System Components

Understanding the Hardware Setup

Here's a breakdown of the components used in the system and how they work together:

- **IoT Device**: This is the device you want to monitor. It could be any electronic device that you wish to track for firmware, chip model, and voltage information.
- **AC Clamp**: The AC clamp is attached to the live wire of your IoT device. It measures the current (in Amperes) flowing through the wire without making direct contact with the electrical circuit, ensuring safety and convenience.
- **SEN0211 Sensor**: The SEN0211 is a current sensor connected to the AC clamp. It detects the current flowing through the live wire and sends this data to the Analog-to-Digital Converter (ADC).
- **ADC (Analog-to-Digital Converter)**: The ADC takes the analog signals (current measurements) from the SEN0211 sensor and converts them into digital data that the Raspberry Pi can read and process.
- **FT232 Module**: The UART pins of the IoT device are connected to the FT232 module. This module converts the UART communication from the IoT device into a USB signal that the Raspberry Pi can understand. It's used to retrieve the firmware version and chip model information from the IoT device.
- **Raspberry Pi**: The Raspberry Pi acts as the central hub of the system. It collects data from the IoT device via the FT232 module connected to the USB port and from the SEN0211 sensor via I2C. The Pi then uploads this data to a cloud server for storage and access.



Raspberry Pi 4 ADS1115 ADC

3. How It Works

Data Collection Process

Once your IoT device is set up and connected to the Raspberry Pi, the system automatically starts collecting data. Here's how it works:

1. **Power on your IoT device**: Ensure that your IoT device is connected to the AC clamp, which in turn is connected to the SEN0211 sensor.
2. **Connect the IoT device to the Raspberry Pi**: Use the USB port on the Raspberry Pi to connect to the IoT device's UART pins. This allows the Raspberry Pi to communicate with the IoT device.
3. **Automatic data retrieval**: As soon as the IoT device is connected, a script on the Raspberry Pi automatically runs. This script gathers the following data:
    - **Firmware version**: The current version of the software running on the IoT device.

- **Chip model**: The specific model of the chip used in the IoT device.
- **Voltage levels**: The voltage being supplied to the IoT device, as measured by the ADC.

4. **Uploading data to the cloud**: After collecting the data, the Raspberry Pi uploads it to our MongoDB Atlas server. This ensures that your data is stored securely and can be accessed from anywhere via our website.

Automatic Data Upload

The beauty of our system lies in its automation. You don't need to manually initiate the data collection or upload process. As soon as your IoT device is connected, the system handles everything behind the scenes. This means you can focus on using the data rather than worrying about how it's collected and stored.

4. Website Features

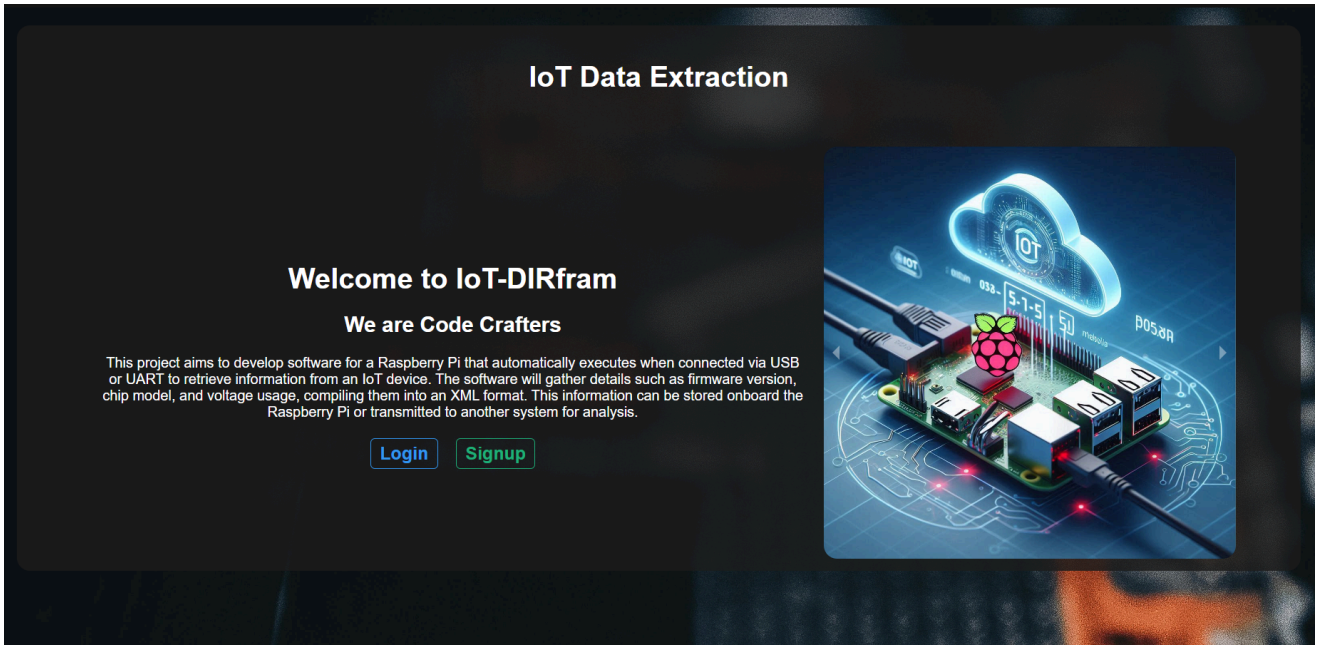
Account Setup

Before you can access the data from your IoT device, you'll need to set up an account on our website. Here's how:

1. **Create an account**: Visit our website and click on the "Sign Up" button. Enter your details, including your email address and a secure password.

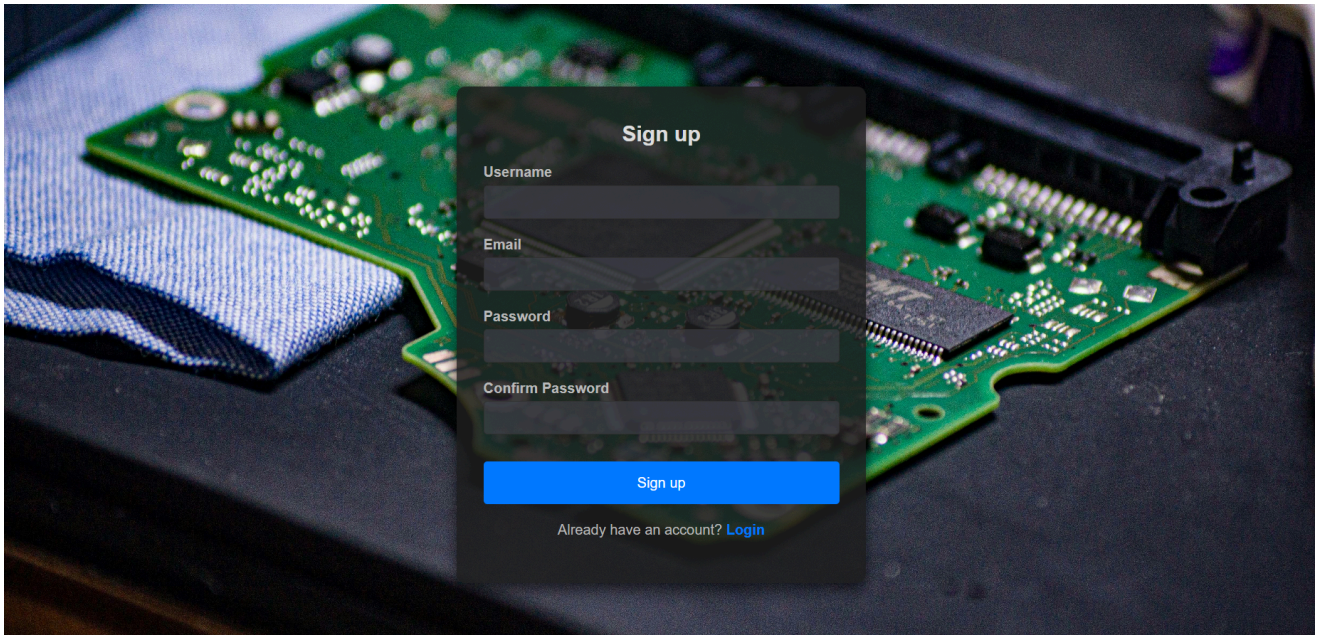
- **Splash Page**

- The *Splash* page is the landing page of the website which details the information regarding the project. You can navigate to log in or sign up using this page.

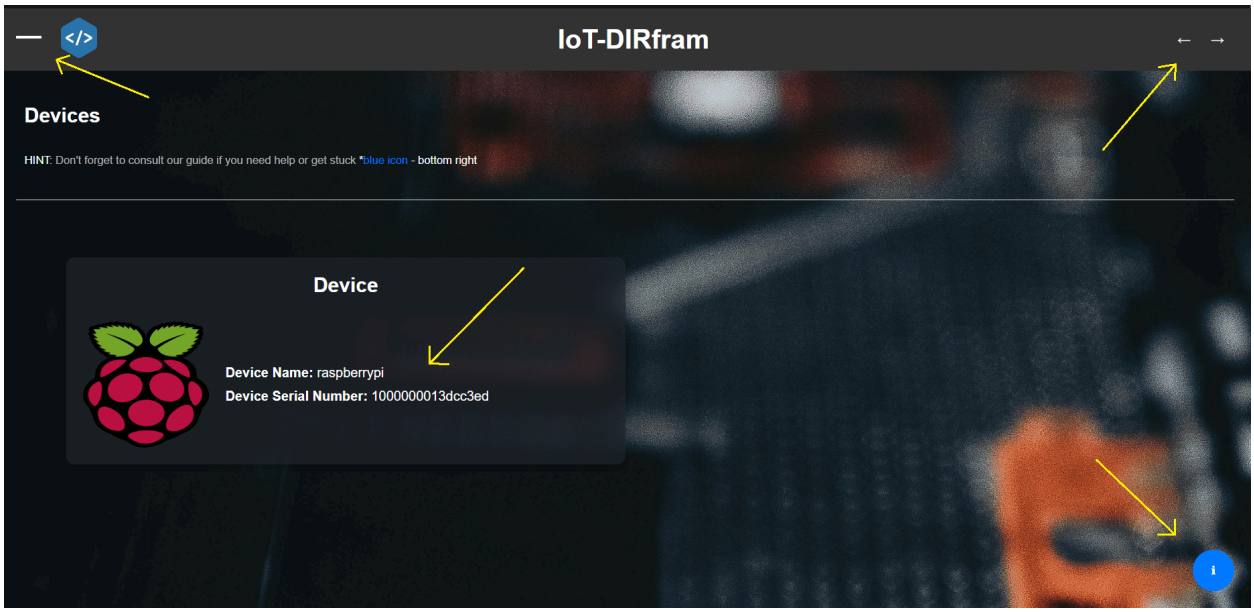


- **Sign-up Page**

- The *Sign-up* page is where a user can create an account to then access the features of our website.



- **Dashboard**
  - The *Dashboard* is the main page of the website, it lists the Raspberry Pis currently on the system as well as info about these devices.



2. **Add your Raspberry Pi**: Once your account is set up, you'll need to link your Raspberry Pi to your account. To do this, go to the "Add Device" section and enter the serial number of your Raspberry Pi. This allows the system to associate the data collected by your Pi with your account.

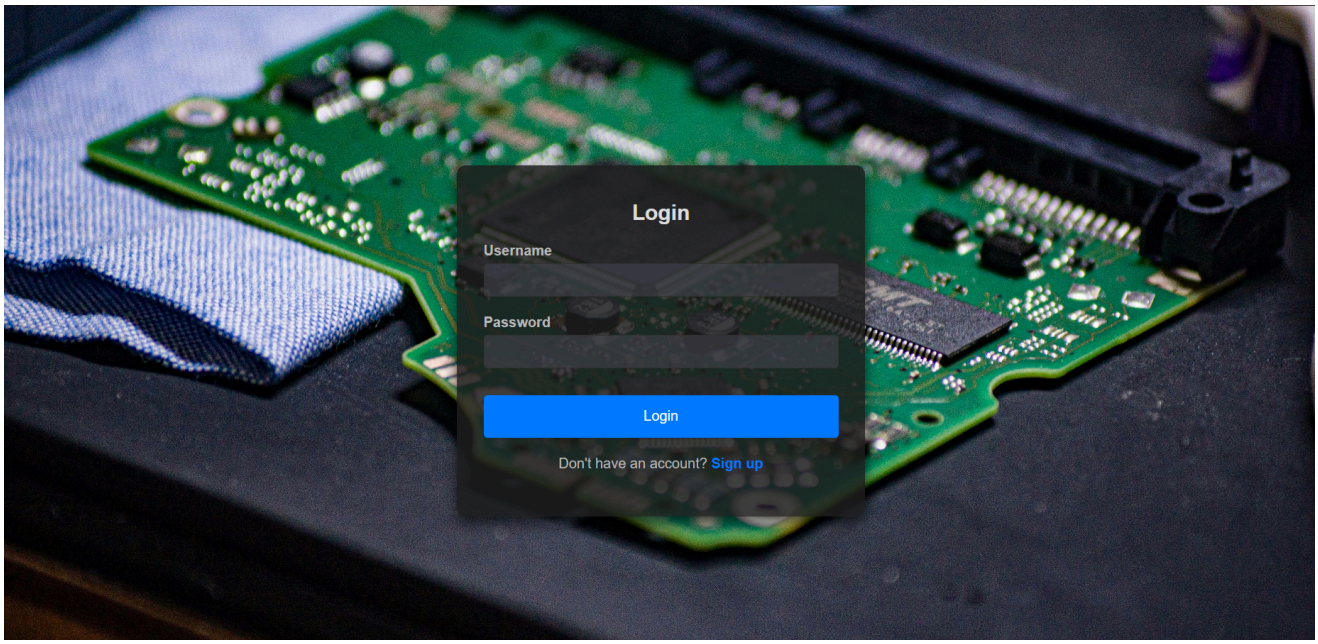
3. **Confirm the addition**: After entering the serial number, click "Add Device." Your Raspberry Pi is now linked to your account, and you can begin accessing the data it collects.

Viewing and Downloading Data

After linking your Raspberry Pi, you can easily view and manage the data it has collected. Here's how:

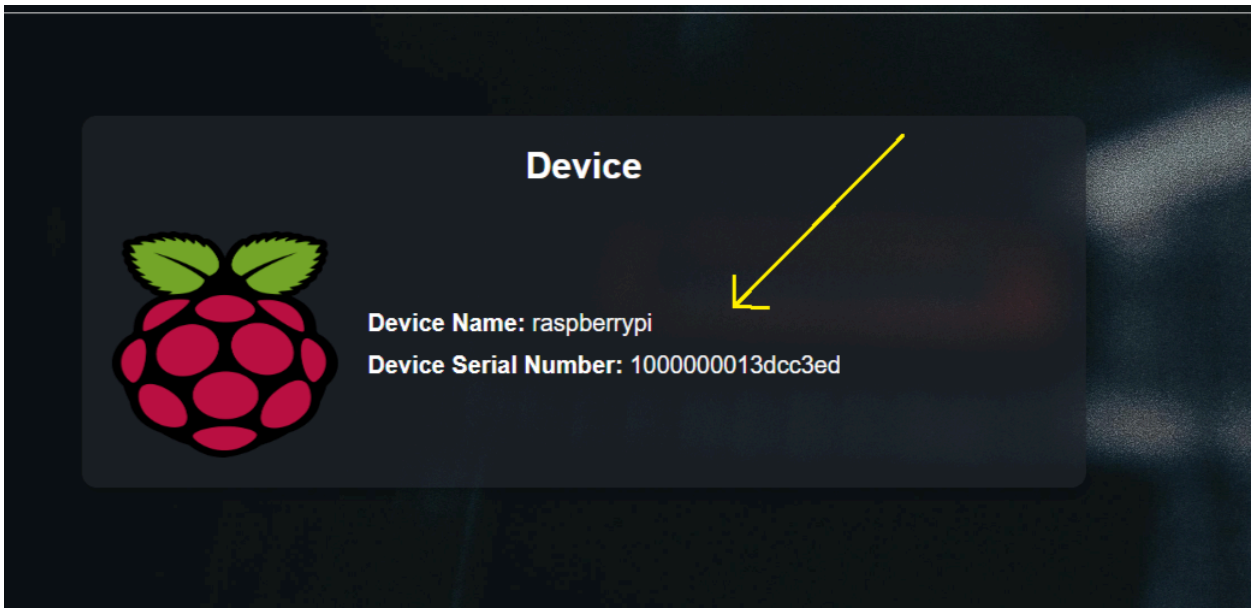
1. **Log in to your account**: Visit our website and log in using your email and password.

- **Login Page**
- The *Login* page is where a registered user can then authenticate to access the website.



2. **Navigate to your devices**: On the dashboard, you'll see a list of Raspberry Pi devices associated with your account. Each Pi device is represented by an icon.

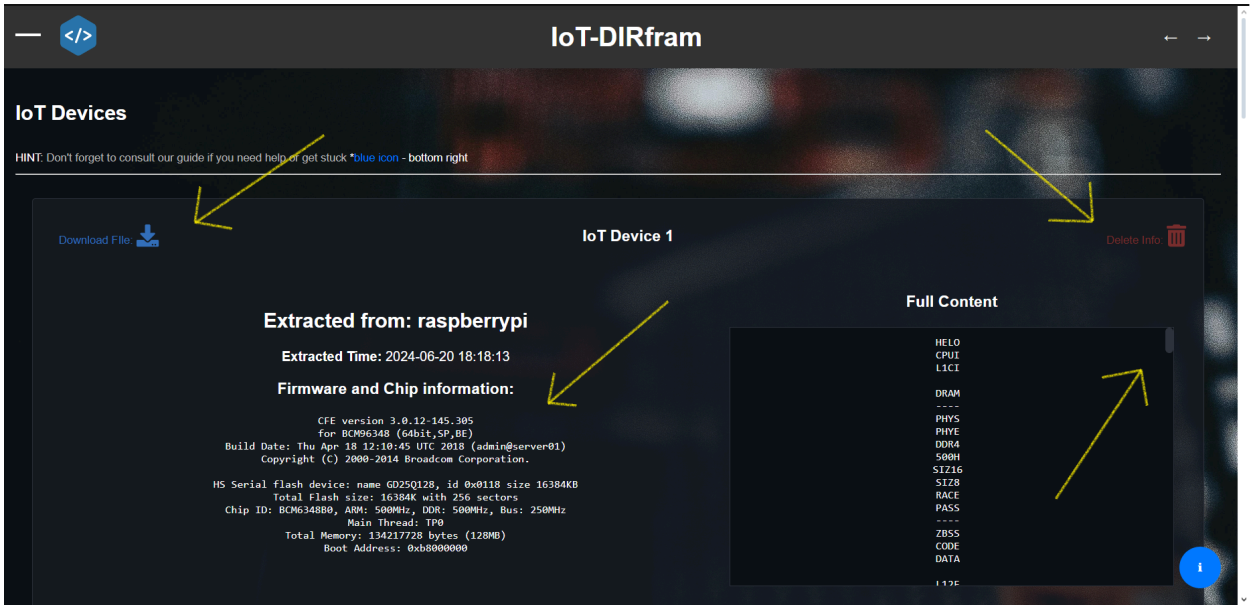
- **Pi Device**
  - This is the available devices on our system. We display the **Name and Serial number** of the device and clicking on it will take you to our *IoT Device* page.



3. **View data**: Click on the Pi device icon to view all the data extracted from that Pi. The data is organized by the date it was extracted, making it easy to find the information you need.

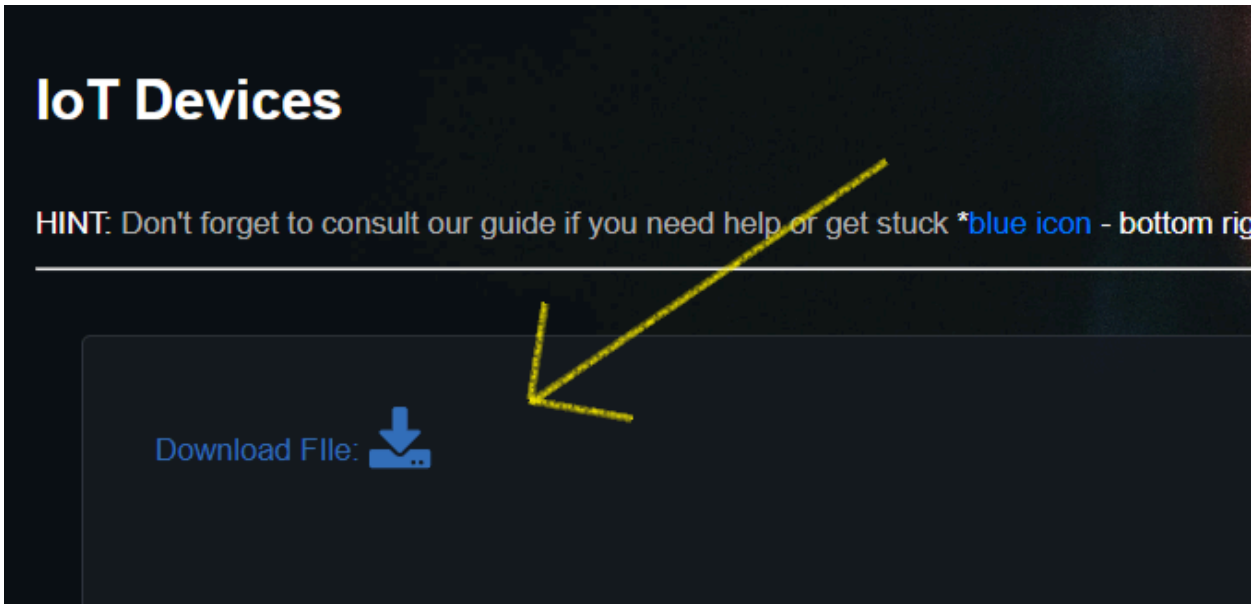
- **IoT Device Page**

- Here you can view all **Serial data** that has been extracted using the selected Raspberry Pi.



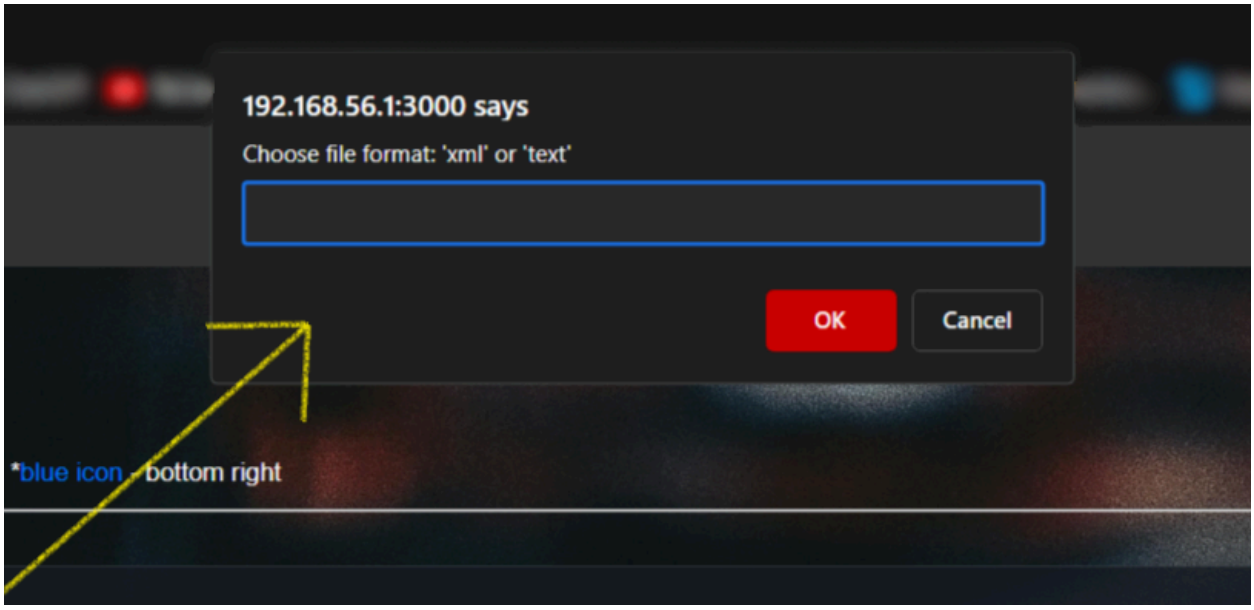
4. **Download data**: If you want to download the data for further analysis or record-keeping, click on the specific entry. You'll have the option to download:
   - **XML file**: Contains the firmware and chip model information.
   - **CSV file**: Contains the current (A) data.

- **Download Button**
  - You can click this to bring up a prompt to download the data log as either **text** or **XML**.



- **Download Prompt**

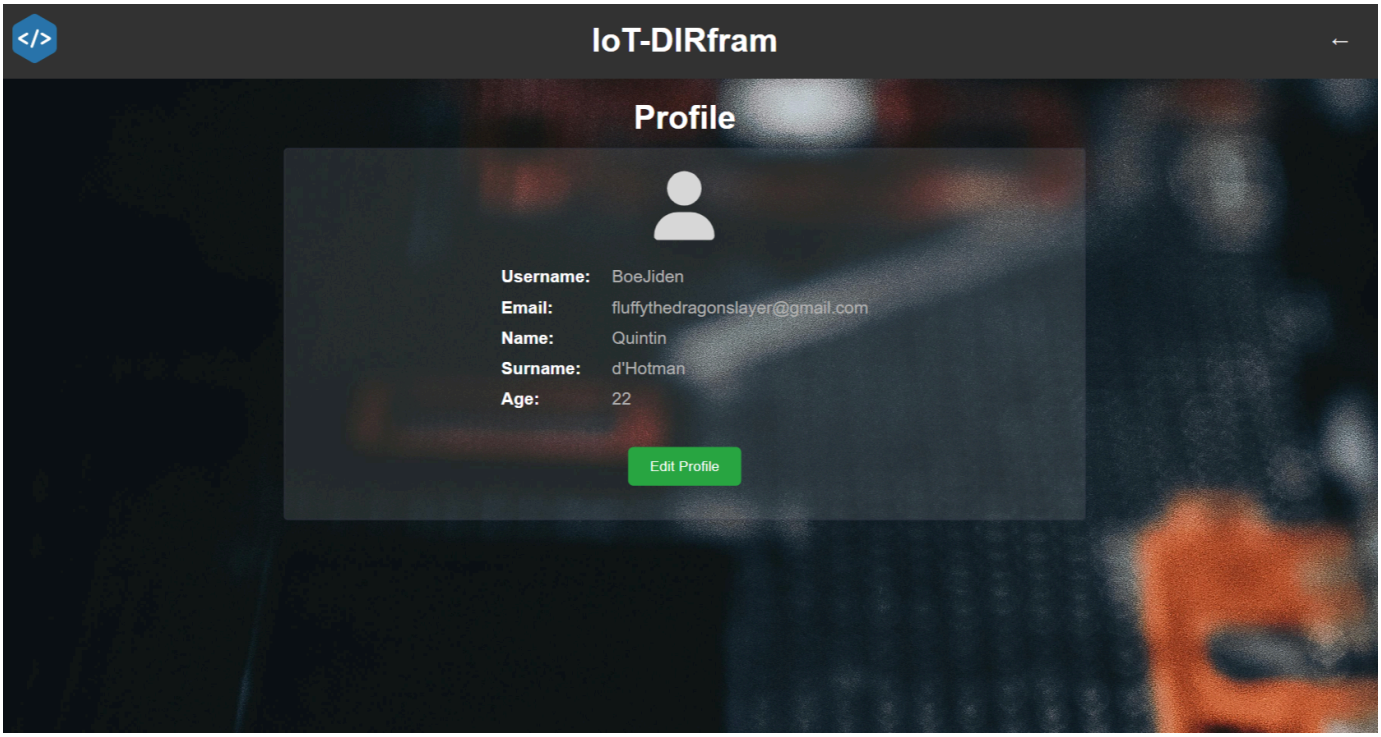
- Enter the format of the file you want to download. eg. *'text'*



Profile Management

You can also manage your profile details directly from the website. Here's how:

1. **Access your profile**: Once logged in, click on your username or profile icon to access the profile page.

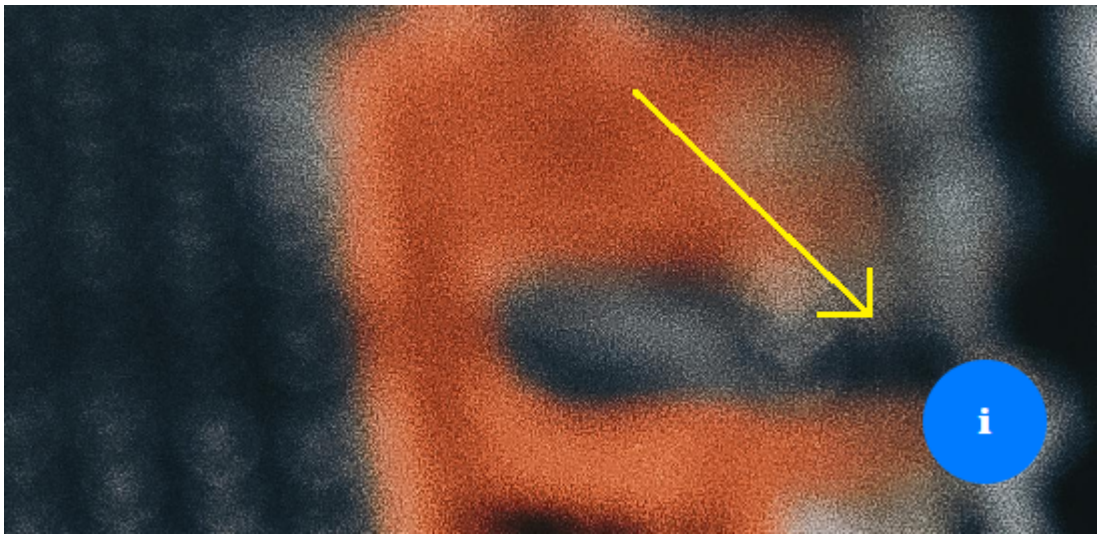


2. **Edit your details**: On the profile page, you can edit your name, surname, age, email, and password. Simply click on the field you want to update, enter the new information, and save the changes.

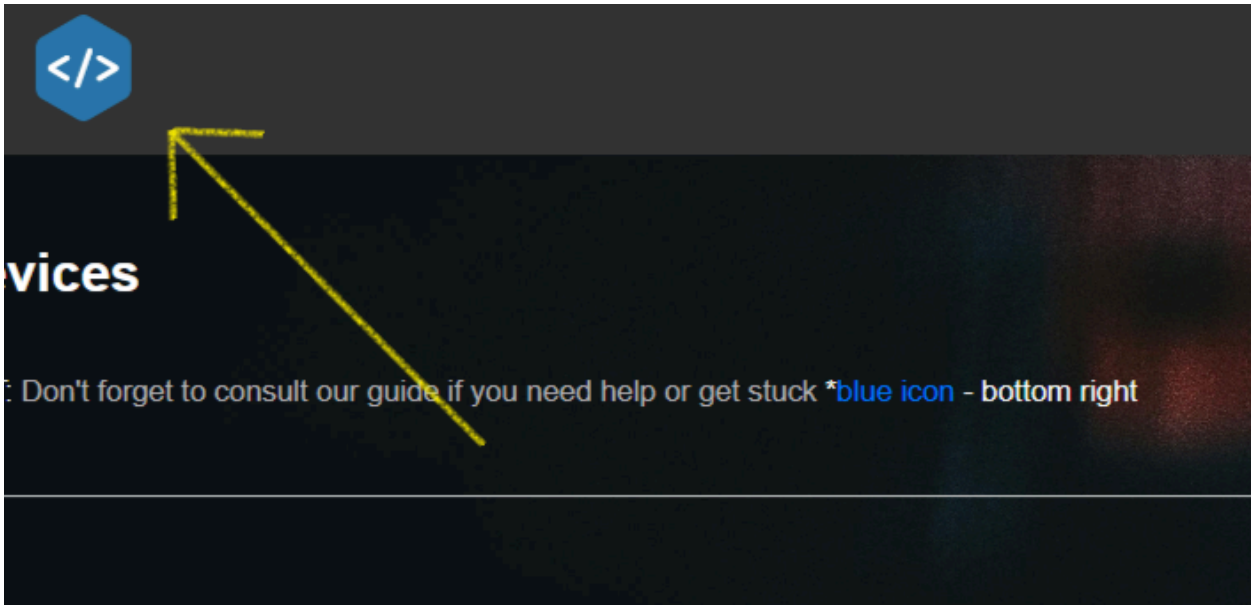
3. **Update your password**: To change your password, enter your current password for verification, followed by the new password. Make sure your new password is strong and secure.

4. **Save changes**: After updating your details, click “Save” to apply the changes. Your profile information will be updated immediately.

- **Help Icon**
    - This icon provides help within the application. It appears in the bottom right.

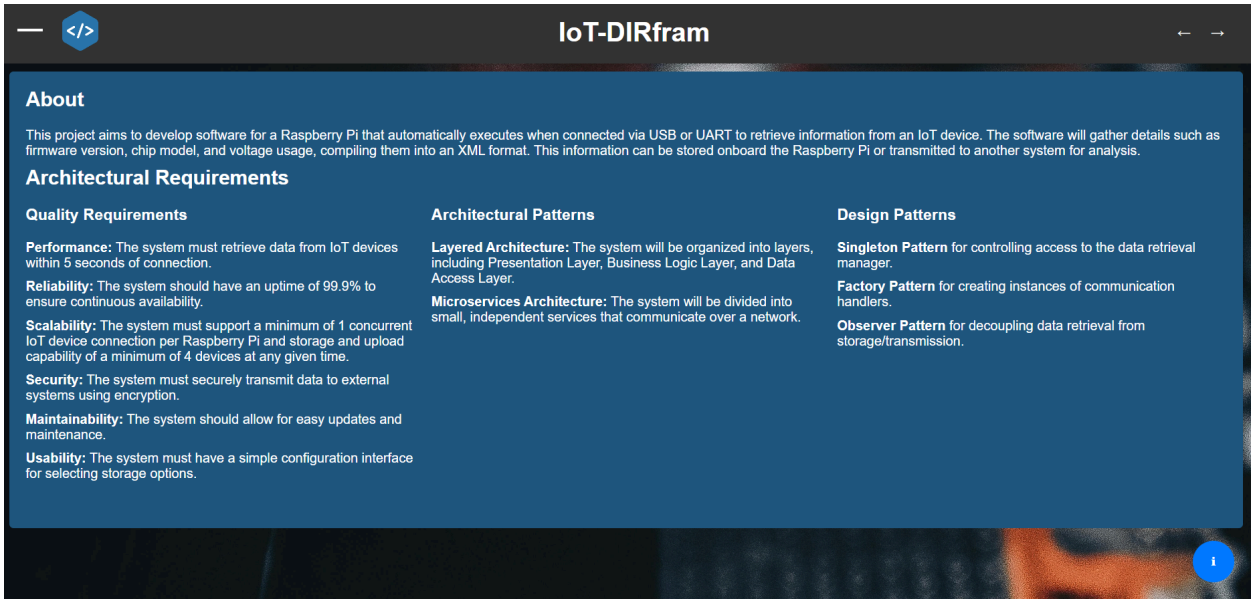


- **About icon**
    - This takes you to the *About* section of our web application.



- **About**

- This page relates to documentation and Architectural requirements of our application.



For More information or errors, please contact codecrafters2024.capstone@gmail.com.

Below is a very simple UML Deployment Diagram of our system:

2. System Components
3. How It Works
4. Website Features

▸ User Stories

+ Add a custom sidebar

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https://github.com/COS301-SE-2024/IoT-DIRfram.wiki.git
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