

Project ID - 11

Progressive Education Society's
Modern College of Engineering, Pune-411005
Department of Electronics and Telecommunication
T.E. E & TC -2022-23

Project Title: Hydroponics Based Precision Farming with Feature Optimization Approach.

Name of the Students: 1. Janhavi Bhor 2. Varad Chaskar 3. Sahaj Chaudhari

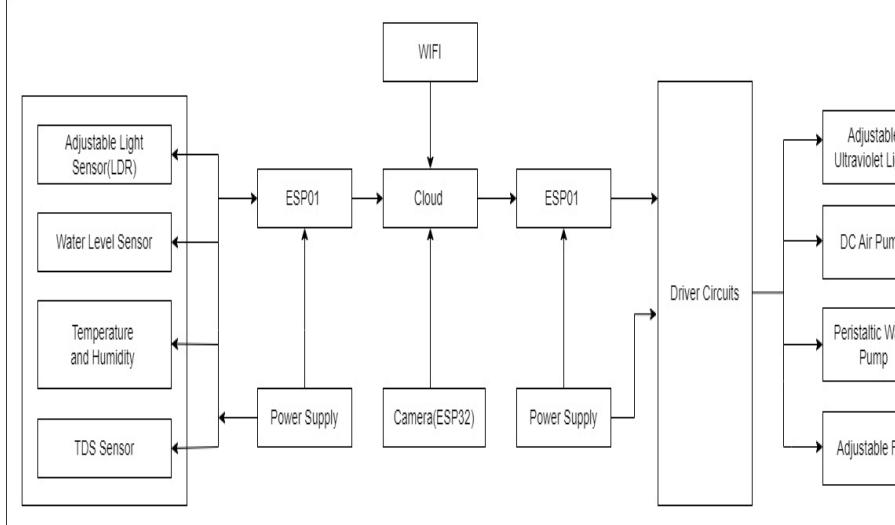
Project Guide Name: Mr. Ramgopal Sahu and Dr. Mrs. K. A. Adoni

Objective: To automate and develop a self-sustaining hydroponics system.

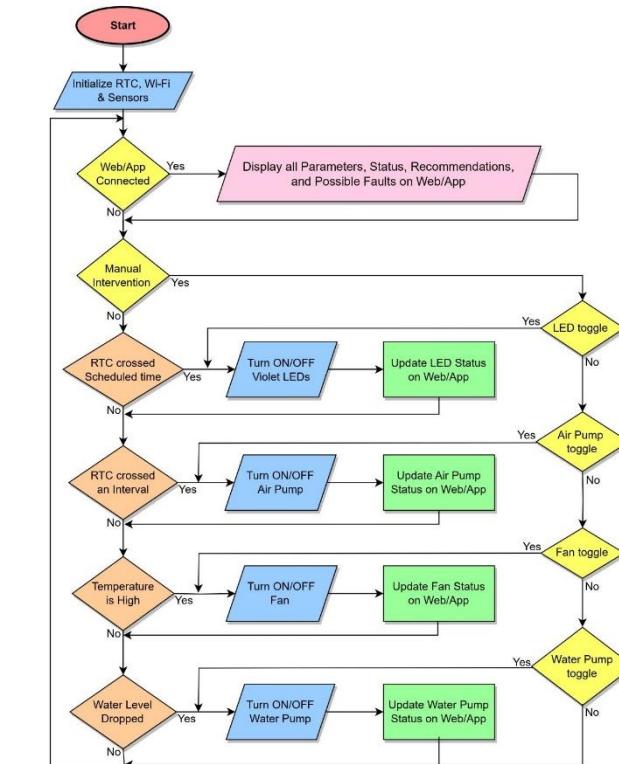
Methodology:

1. **Conduct research on optimizing** the effects of TDS, air pump duration UV light duration on plant growth with various control schemes as per given data with appropriate algorithms.
2. Design air pump, water pump, fan **driver circuits** for effective and safe use of electronics resources.
3. Implementation of **Image processing and analysis** to support monitoring of Plant growth.
4. Integration of **cloud and IoT technology** for data processing and enabling for future advancements.
5. Use of **M2M techniques** for efficient data flow of the system.
6. Power Optimization Using **Time slotting**.
7. UPS using **mosfet as a diode controlled device** and NOT logic.
8. Real-Time Clock (**RTC**) to **schedule** operations.

Block Diagram:



FlowChart:



Testing & Debugging:

1. Time and space Complexity for Algorithms.
2. Features comparison using L1 and L2 Regulation.
3. If the UV light didn't turn ON/OFF at the scheduled time in RTC, check the power supply connections of the UV light.
4. Fan turns ON when the temperature is above 32°C, if the fan didn't turn ON, check the power supply connections of the fan.
5. LDR can be calibrated as per need by adjusting the potentiometer.

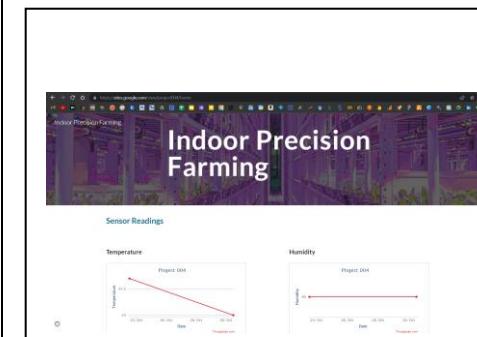
Specifications:

1. Physical size: 1.5m*0.5*2m
2. Power Rating: 5V, 2A, 10W
3. Domain: IOT, Cloud, Deep tech.

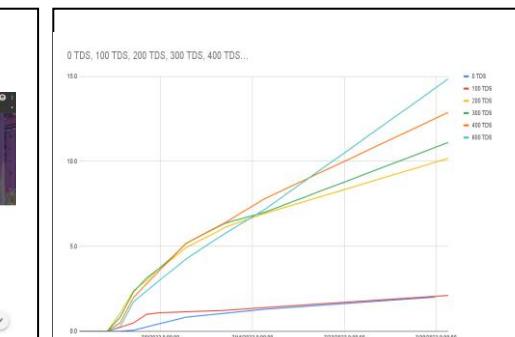
Features:

- High Yield system
- Compact design
- Economical and Scalable product
- Fault detection
- Remote user control

Results:



Hardware integrated Webpage



Effect of TDS on Plant Height

Conclusion: Hydroponics Based Precision Farming with Feature Optimization Approach has several benefits in addition to faster growth and reduced water consumption. This entire system will operate on its own, there will be no need for human Intervention, making it an ideal solution for individuals or businesses seeking to maximize crop yields while minimizing labor and resource costs.