**An AI Based System Design to Develop and Monitor a Hydroponic Farm (Hydroponic Farming for Smart City)-**

**Aim-**

In this paper, authors proposed to prepare an Artificial Intelligent system to do hydroponic farming in **closed environment** which will automatically deliver mix of water and nutrient solution along with light, directly to the roots of plants using sensors. For experiment they have used Tomato F1 Hybrid seed. This system will help in calculating the average growth rate ratio for Tomato F1 Hybrid Suhyana seed that are grown hydroponically and would compare it with soil grown plants. This paper shows how automatic hydroponic system can be implemented using Raspberry Pi 3 with Micro controller to control and monitor all the sensors connected to it. This system is implemented in closed environment for automating crop plantation. It describes how the mix of water, Light and nutrient solution will be automatically delivered to the roots of tomato plants by maintaining the pH level of the nutrient solution and temperature.

**Defects/Improved/Future Work-** Boxes are their but their are no cabinets which can be removed or added and also ours is movable. Their is nothing mentioned how ai is used where it is used, if else used in prototype. More focused on conditions and taking data.

good things- water height, different light at different day time.

**Applied Internet of Thing for Smart Hydroponic Farming Ecosystem (HFE)-**

This paper proposes a Hydroponic Farming Ecosystem (HFE) that uses IoT devices to monitor humidity, nutrient solution temperature, air temperature, PH and Electrical Conductivity (EC). To make the system easy to control and easy to use, they have used **an android application** to control IoT devices in the HFE and alarm users when their farm is in an abnormal situation. This paper applies the Internet of Things for Smart Hydroponic Farming Ecosystem (HFE) and automates hydroponic farming. After the experiments conducted they showed this system could work whether using it in automatic or manual mode. Further work is applying the system in a symmetrical plantation to check the accuracy of the HFE across multiple farms in the same area; and verify that controlling via mobile application works correctly.

**Defects/Improved/Future Work-** Nothing mentioned about light, how will provide light, no design

Good- iot rotor changing speed of water flow, app idea is good, tested each sensor in diff. Phases.

**Hommons: Hydroponic Management and Monitoring System for an IOT Based NFT Farm Using Web Technology-**

In this paper, a hydroponic monitoring and automation system is proposed that can be monitored using sensors connected to the Arduino Uno microcontroller, Wi-Fi module ESP8266 and Raspberry Pi 2 Model B microcomputers as the webserver with the concept of Internet of Things, in which each block hydroponic farming can communicate with the webserver. Web is used as the interface of the system that allows user to monitor and control the NFT hydroponic farming. The NFT hydroponic web interface management systems uses a responsive web framework, such as Bootstrap for the front-end, JQuery and JavaScript libraries. The result shows that this system helps farmers to increase the effectivity and efficiency on monitoring and controlling NFT Hydroponic Farm. The future work of this research is to collect environmental data, which is obtained from sensors and implanting an artificial intelligence that makes the Hydroponic Management and Monitoring System can run automatically.

**Defects/Improved/Future Work-** Focused on farm management system, solar used as main power not effective in cloudy days, costly inverter, costly tp link, not completely closed, acc. To design will have to keep in open under sunlight, area required large, not automatic

Good- save electricity using solar, website

**Hydroponic Nutrient Control System based on Internet of Things and KNearest Neighbors-**

In this research, propose a system that measures pH, TDS, and nutrient temperature values in the nutrient film technique (NFT) technique using a couple of sensors. We use lettuce as an object of experiment and apply the KNN (k-Nearest Neighbor) algorithm to predict the classification of nutrient conditions. The result of prediction is used to provide a command to the microcontroller to turn on or off the nutrition controller actuators simultaneously at a time. The experiment result shows that the proposed KNN algorithm achieves 93.3% accuracy when k=5.

This research conducted to test the design of a hydroponic system with IoT on a prototype scale that uses a k-Nearest Neighbor (KNN) to classify nutrient conditions. The evaluated system shows that KNN successful classifies the nutrient condition with several k values. The classification result output can be used in a realtime condition and used as a command to the actuator module. The actuator also can turn on or off the nutrition controller simultaneously at a time according to the label that is classified. More experiments with more data in various conditions can improve system accuracy.

**Defects/Improved/Future Work-** Different containers for different ph and nutrition, lot of space, machine learning algorithm used, if else more relaiable.

Good- using ml here