SMART FARMER – IOT Enabled Smart Farming Application

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1.Title: Smart Farming Technology Review: Keynote Address

Author: **"**H. Yeo"

Published in : 2022 IEEE/ACIS 20th International Conference on Software Engineering Research, Management and Applications (SERA)

Description: Smart Farming is a concept of farming management using modern technology to increase the quantity and quality of agricultural products, which is a new trend in Agriculture Technology. Like many other industries, technology is changing the ways that farmers manage their operations. New developments in machinery, software, and genetics are allowing farmers to have more control over how they plant and manage their crops. Smart Farming Technology has played a big role in developing the agricultural industry. In this keynote, overall Smart Farming Technology is briefly introduced, and several examples of Smart Farm will be presented. Finally, standard activity about Smart Farming Technology is introduced.

2.Title: Light Control Smart Farm Monitoring System with Reflector Control

Author: "J. Choi, D. Lim, S. Choi, J. Kim and J. Kim"

Published in : 2020 20th International Conference on Control, Automation and Systems (ICCAS)

Description: This study uses Arduino and DC motors to construct a system that monitors and manages a smart farm. Lighting controls in conventional smart farms regulate the brightness of artificial light sources like LED lights. The maintenance expense of using artificial light continually is expensive for this traditional method. In this study, we design a system that uses the reflector's angle control to regulate the

amount of light entering the system. In order to provide the ideal climate for a smart farm, we also monitor environmental data such as temperature, humidity, carbon dioxide (Co2), and light value. The ventilator and heater are used to regulate the temperature. Additionally, real-time environmental data can be sent to the server to evaluate the compiled data on a chart, and we compile the ideal.

3.Title: Mobile Application Development of Hydroponic Smart Farm using Information Flow Diagram

Author: "M. Rukhiran and P. Netinant"

Published in : 2020 - 5th International Conference on Information Technology (InCIT)

Description: The cutting-edge Internet of Things technology has been steadily superseded and modified for the digital age. When designing and creating automated, precise farm systems, precision agriculture must be taken into account. One of the difficult projects to handle with various design and development methodologies is the hydroponic smart farm. We intend to concentrate on the architecture design of the hydroponic smart farm system and the user interface design using Information Flow Diagram in this study. We also intend to evaluate our hydroponic smart farm system using the Technology Acceptance Model (TAM). Through the use of the smart farm system, we have discovered a lack of farmer adoption of the Internet of Things. In a potential smart home, our proposal helps to accomplish the better Internet of Things system and application.

4.Title: IoT Sensor Network Approach for Smart Farming: An Application in Food, Energy and Water System

Author: "Y. Mekonnen, L. Burton, A. Sarwat and S. Bhansali"

Published in : 2018 IEEE Global Humanitarian Technology Conference (GHTC)

Description: As the global population soars from today's 7.3 billion to an estimated 10 billion by 2050, the demand for Food, Energy and Water (FEW) is expected to more than double. Such an increase in population and consequently, in the demand for FEW resources will undoubtedly be a great challenge for humankind. A challenge that will be exacerbated by the need for humankind to meet the greater demand for resources with a smaller ecological footprint. This paper is proposing a system developed to optimize the use of water, energy, fertilizers for agricultural crops as a solution to this great challenge. It is an

automated smart irrigation system that uses real time data from wireless sensor networks to schedule an irrigation.

5.Title: Smart Farming Using Internet of Thing(IoT) in Agriculture by Tangible Progarmming for Children

Author: "S. Meadthaisong and T. Meadthaisong"

Published in : 2020 17th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)

Description: The internet of thing(IoT) applied in many applications such as smart industry, smart city, smart life, and Intelligent Agriculture normally the system design by expert. Which system design and programming maybe difficult for children or novices as they cannot learning and program it. This research present our vision tangible programming for children developmenting of internet of thing(IoT) in agriculture. Using tangible programming without program by computer or tablet. Which this encourages children to learn and apply concept for smart farm systems such as monitor temperature and humidity , on web online temperature, on web online humidity. We found that the children could understand idea smart farming using internet of thing(IoT) in agriculture and algorithm of programming.

6.Title: Extraction of Reflectance Maps for Smart Farming Applications Using Unmanned Aerial Vehicles

Author: "G. Livanos *et al*."

Published in : 2020 12th International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP)

Description: Using Unmanned Aerial Vehicles, a reliable framework for smart remote sensing of cultivations is described in this application paper, producing a practical instrument with enhanced capabilities in terms of speed, accuracy, user-friendliness, adaptability, and expandability. The suggested system integrates fixed-wing unmanned aerial vehicle functionality with multispectral imaging, automated navigation, and real-time monitoring capabilities. At this stage of system development, offline analysis of the acquired data is carried out using potent commercial software to extract the reflection map of the agricultural region under study based on the Normalized Difference Vegetation Index. The proposed

method has been put to the test on a few cultivations in two different areas (Greece), with the goal of documenting field variability and identifying early indicators of crop stress. Initial findings show that the suggested.

7.Title: Wireless Sensor Network Utilizing Flexible Nitrate Sensors for Smart Farming

Author: "X. Jiang *et al*"

Published in: 2019 IEEE SENSORS

Description: Smart Farming represents the application of modern IoT networks into agriculture, leading to what can be called a Third Green Revolution. This paper describes a fully customized hardware platform, with a novel network structure enabled by LoRa and ANT radios, that aims for a low-cost, low power and long range wireless sensor network for smart farming. The hybrid network structure was demonstrated in the Lab and the LoRa portion of the network was tested by deploying four modules across an agricultural site, with data collected over a six months period. The hardware was tested by integrating fabricated nitrate sensors as well as commercially available soil and temperature sensors into the modules. The data collected were made accessible to both researchers and farmers through the cloud.

8.Title: Smart Farm Based on Six-Domain Model

Author: "W. Xu, Z. Kaili and W. Tianlei"

Published in: 2021 IEEE 4th International Conference on Electronics Technology (ICET)

Description: The Internet of Things' most advanced design is its architecture (IoT). International standards have specified the reference architecture of the Internet of Things based on a six-domain model. The system architecture for a smart farm must be established and meet international standards. The entity integration of the user domain, physical entity domain, sensing & controlling domain, application & service domain, operations & management domain, and resource access & interchange domain of the smart farm is determined through a thorough analysis of the agricultural production and management process and an in-depth study of the

international standards for the IoT reference architecture. The suggested reference architecture for the smart farm has six domains. Compatibility, adaptability, and scalability are benefits.

9.Title: Understanding IoT climate Data based Predictive Model for Outdoor Smart Farm

Author: "J. Park, A. Moon, E. Lee and S. Kim"

Published in: 2021 International Conference on Information and Communication Technology Convergence (ICTC)

Description: The Internet of Things' most advanced design is its architecture (IoT). International standards have specified the reference architecture of the Internet of Things based on a six-domain model. The system architecture for a smart farm must be established and meet international standards. The entity integration of the user domain, physical entity domain, sensing & controlling domain, application & service domain, operations & management domain, and resource access & interchange domain of the smart farm is determined through a thorough analysis of the agricultural production and management process and an in-depth study of the international standards for the IoT reference

10.Title: Smart Farming – IoT in Agriculture

Author: "R. Dagar, S. Som and S. K. Khatri"

Published in: 2018 International Conference on Inventive Research in Computing Applications (ICIRCA)

Description: IoT is a revolutionary technology that represents the future of communication & computing. These days IoT is used in every field like smart homes, smart traffic control smart cities etc. The area of implementation of IoT is vast and can be implemented in every field. This paper is about the implementation of IoT in Agriculture. IoT helps in better crop management, better resource management, cost efficient agriculture, improved quality and quantity, crop monitoring and field monitoring etc. can be done. The IoT sensors used in proposed model are air temperature sensor, soil pH sensor, soil moisture sensor, humidity sensor, water volume sensor etc.