

A Review on Smart Agriculture using IoT

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Abstract: *The Internet of Things (IoT) is a mechanism that enables everything to be managed over a computer network. By 2020, there could be over 30 billion connected gadgets, according to estimates. The calls for IoT in agriculture are directed at conventional agricultural businesses to meet rising demand and reduce waste production. IoT in agriculture uses equipment, drones, and sensors. Using IoT technology, a computerized agricultural system is developed to track and manage key farming factors like climate, moisture, soil humidity content, and sunshine. To feel the concepts, the sensors must be placed in the proper locations and orientations. Using clever approaches, it is possible to alter the automated structure's water availability, humidity, and temperature. Numerous approaches should be discussed.*

Keywords: Internet of Things

REFERENCES

- [1]. Raza, U.; Kulkarni, P.; Sooriyabandara, M. Low Power Wide Area Networks: An Overview. IEEE Commun. Surv. Tutor 2017, 19, 855–873. [Google Scholar] [CrossRef][Green Version]
 - [2]. Adu-Manu, K.; Tapparello, C.; Heinzelman, W.; Katsriku, F.; Abdulai, J. Water Quality Monitoring Using Wireless Sensor Networks: Current Trends and Future Research Directions. ACM Trans. Sens. Netw. 2017, 13, 4. [Google Scholar] [CrossRef]
 - [3]. Muangprathuba, J.; Boonnama, B.; Kajornkasirat, S.; Lekbangpong, N.; Wanichsombat, A.; Nillaor, P. IoT and agriculture data analysis for the smart farm. Comput. Electron. Agric. 2019, 156, 467–474. [Google Scholar] [CrossRef]
 - [4]. Goap, A.; Sharma, D.; Shukla, A.; Krishna, C. An IoT-based smart irrigation management system using Machine learning and open source technologies. Comput. Electron. Agric. 2018, 155, 41–49. [Google Scholar] [CrossRef]
 - [5]. Munir, M.S.; Bajwa, I.S.; Naeem, M.A.; Ramzan, B. Design and Implementation of an IoT System for Smart Energy Consumption and Smart Irrigation in Tunnel Farming. Energies 2018, 11, 3427. [Google Scholar] [CrossRef]
 - [6]. Tzounis, A.; Katsoulas, N.; Bartzanas, T.; Kittas, C. Internet of Things in agriculture, recent advances and future challenges. Biosyst. Eng. 2017, 164, 31–48. [Google Scholar] [CrossRef]
 - [7]. Ruan, J.; Wang, Y.; Chan, F.T.S.; Hu, X.; Zhao, M.; Zhu, F.; Shi, B.; Shi, Y.; Lin, F. A Life-Cycle Framework of Green IoT-Based Agriculture and Its Finance, Operation, and Management Issues. IEEE Commun. Mag. 2019, 57, 90–96. [Google Scholar] [CrossRef]
 - [8]. Khanna, A.; Kaur, S. Evolution of Internet of Things (IoT) and its significant impact in the field of Precision Agriculture. Comput. Electron. Agric. 2019, 157, 218–231. [Google Scholar] [CrossRef]
 - [9]. Almeida, R.; Oliveira, R.; Luís, M.; Senna, C.; Sargento, S. A Multi-Technology Communication Platform for Urban Mobile Sensing. Sensors 2018, 18, 1184. [Google Scholar] [CrossRef] [PubMed]
 - [10]. Cerchecci, M.; Luti, F.; Mecocci, A.; Parrino, S.; Peruzzi, G.; Pozzebon, A. A Low Power IoT Sensor Node Architecture for Waste Management within Smart Cities
 - [11]. Hicham, K.; Ana, A.; Otman, A.; Francisco, F. Characterization of Near-Ground Radio Propagation Channel for Wireless Sensor Network with Application in Smart Agriculture. In Proceedings of the 4th International Electronic Conference on Sensors and Application, Solely Online, 15–30 November 2017; Volume 2. Available online: <https://sciforum.net/conference/ecsa-4> (accessed on 3 June 2019).
 - [12]. Nobrega, L.; Golcalves, P.; Pedreiras, P.; Pereira, J. An IoT-Based Solution for Intelligent Farming. Sensors 2019, 19, 603. [Google Scholar] [CrossRef] [PubMed]
- Rousseau, L.; Le Sommer, N. Contribution of the Web of Things and the Opportunistic Computing to the Smart

- Agriculture: A Practical Experiment. Sensors 2019, 11, 33. [Google Scholar] [CrossRef]
- [13]. Digi. ZigBee RF Modules XBee2, XBeePro2, Pro S2B User Guide. 2017. Available online: <https://www.digi.com/resources/documentation/digidocs/pdfs/90000976.pdf> (accessed on 20 April 2018).
- [14]. Quectel. Quectel UG95 Ultra-Small UMTS/HSPA Module Datasheet. 2015. Available online: https://www.quectel.com/UploadFile/Product/Quectel_UG95_UMTS&HSPA_Specification_V1.5.pdf (accessed on 20 April 2018).
- [15]. Semtech. SX1272/73—860MHz to 1020MHz Low Power Long Range Transceiver Datasheet. 2017. Available online: <https://www.semtech.com/uploads/documents/sx1272.pdf> (accessed on 20 April 2018).
- [16]. LTE Release-13. Available online: <https://www.3gpp.org/DynaReport/FeatureListFrameSet.htm> (accessed on 20 May 2019).
- [17]. Microchip. ATmega2560 Complete Datasheet. 2014. Available online: <https://www.microchip.com/wwwproducts/en/atmega2560> (accessed on 2 January 2014).
- [18]. <https://media.digikey.com/pdf/DataSEN0193.pdf> (accessed on 3 June 2019).
- [19]. LM393 Sensor. 2019. Available online: <https://www.openhacks.com/uploadsproductos/rain-sensor-module.pdf> (accessed on 3 June 2019).
- [20]. ILMPU5 Sensor. 2019. Available online: <https://www.newark.com/carlo-gavazzi/ilmpu-5/liquid-level-sensor/dp/73M3127> (accessed on 3 June 2019)