LITERATURE REVIEW

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| **S.NO** | **TITLE AND AUTHOR** | **YEAR AND PUBLICATIONS** | **METHODOLOGY** | **ADVANTAGE** | **DISADVANTAGE** |
| 1 | Future of Smart Farming with Internet of Things  *Ravi Gorli Assistant Professor Department of Computer Science & Engineering, GIT, GITAM* | 2017  Journal of Agriculture and Water Works Engineering Volume 1 Issue 1 | IoT brings to the table, its ability to innovate the landscape of current farming methods. IoT sensors capable of providing farmers with information about crop yields, rainfall, pest infestation, and soil nutrition are invaluable to production and offer precise data which can be used to improve farming techniques over time. New hardware, like the corn-tending Rowbot, is making strides by pairing data-collecting software with robotics to fertilize the corn, apply seed cover-crops, and collect information in order to both maximize yields and minimize waste. | * Smart agriculture use drones and robots * These improves data collection process and helps in wireless monitoring and control * Solar powered and mobile operated pumps save cost of electricity. | * lack of information * high adoption costs * security concerns |
| 2 | Smart Farming using IoT, a solution for optimally monitoring farming conditions  *Jash Doshi, Tirthkumar Patel, Santosh kumar Bharti* | November 2019  The 3rd International workshop on Recent advances on Internet of Things: Technology and Application Approaches | It is an IoT device with the concept of “Plug and Sense”. This device monitors the farm or greenhouse and based upon the readings of different kind of sensors like temperature, humidity, soil moisture, UV, IR, soil nutrients and gives different types of messages to the farmer about the present conditions so that the farmer can take quick action. | * increase the productivity * proper use of natural resources * environment friendly * cheap product for farmers | * There could be wrong Analysis of Weather Conditions * Requires continuous internet connection |
| 3 | Smart Farming with Fertilizer Dispenser and Predictive Analysis  *T. Bernatin\*, V.J.K.Kishor Sonti ,Sahaya Anselin Nisha* | 2019  T. Bernatin et al /Journal of Pharmaceutical Science & Research Vol. 11(8). | In this system colour sensor is used to find the RGB values of the leaf which helps to find the exact value of fertilizer depending on palette number instead of taking the mean of two palette numbers and also to reduce the observational errors. It helps us to give the accurate values to dispense. This system helps us in improvement of the quality and the quantity of the crop production compares to the LCC existing system. | * Increase quality and quantity of crop production. * save time * Decrease the difficulty of working. | * Higher annual operating cost * More routine maintenance required. |
| 4 | Review—Machine Learning Techniques in Wireless Sensor Network Based Precision Agriculture  *Yemeserach Mekonnen, Srikanth Namuduri, Lamar Burton, Arif Sarwat, z and Shekhar Bhansali* | 2020  Journal of The Electrochemical Society. | This paper has shown different ML models applied in multiple applications within the precision agriculture ecosystem, including yield prediction, weed, and disease detection. The reviewed work has only been focused specifically on WSN based PA application where ML algorithms were implemented for data mining, forecasting, and automation purpose. | * power-efficient * cost-effective * low maintenance | * Complexity * Leads various kinds of network attacks. |
| 5 | Smart Farming: An Enhanced Pursuit of Sustainable Remote Livestock Tracking and Geofencing Using IoT and GPRS  *Qazi Mudassar Ilyas and Muneer Ahmad* | **2020**  **IEEE**  Hindawi Wireless Communications and Mobile Computing Volume 2020, Article ID 6660733 | **A** geographical paddock to monitor spatiotemporal behaviors of livestock. The proposed solution provides convenience to farmers to define a geographical safe zone for livestock. The navigation and communication are automatically controlled according to the genetic diversity of different animals. The system calculates the distance of each animal from the safe zone geographical boundary and alarms the farmer when the distance of the animal gets close to a threshold value | * reduces the time * reduces energy complexity of the system * Integrated modules. | * Increased privacy concerns. * Increased unemployment rate. * Highly dependent on the internet. |
| 6 | Challenges and Opportunities in  Machine-Augmented Plant Stress Phenotyping  Arti Singh, Sarah Jones, Baskar Ganapathysubramanian,Soumik Sarkar,Daren Mueller,  Kulbir Sandhu,and Koushik Nagasubramanian | 2021  Journal  Trends in Plant Science, January, Vol. 26, No. 1 | Big data collection enabled by unmanned aerial system (UAS) technology and ground robots coupled with ML will add value to agricultural technologies based on field stress phenotyping  To improve farmers’ decision-making power and crop yields. Once a robust ML framework is trained on a large image dataset spanning all the variability present for that particular trait, it can be easily packaged into an intuitive Graphical user interface deployable on a smartphone, robot, and UAS for routine use in field applications. | * cost-effective disease phenotyping * achieve spectral image super-resolution | * Increased channel maintenance. * Reliability. * Cost. |
| 7 | Implementation of Smart Farming using IoT  *A. Vani , N. Sukesh Reddy , M. Parsharamulu & N.Mahesh* | April-June 2021  Asian Journal of Applied Science and Technology (AJAST) Volume 5, Issue 2, Pages 58-67 | The data from the sensor is sent to the ThingSpeak platform by using API keys. Arduino also sends a message to the farmers mobile indicating that animals were trying to enter the field. Soil Moisture Sensors used to find the moisture of the soil. By detecting the moisture and if is below the required level then Arduino sends a message to the farmers mobile indicating that it is required to water the field. The farmer then sends a message to switch on the motor. Whenever the supplied water is sufficient Arduino sends another message to tell the farmer to switch off the motor. Farmer then switches of the motor by sending a message to the GSM module. | * improves the real-time performance of the user to   the agricultural environment change   * whole system is advanced, reliable and convenient * reduce the hardware * Complexity. | * Every soil type to be calibrated. * Take time to analyse the things. * cost |
| 8 | Smart Agriculture System With E – Carbage Using Iot  *Dr.A.Senthil Kumar, Dr.G.Suresh, Dr.S.Lekashri, Mr.L.Ganesh Babu,*  *Dr. R.Manikandan* | 2021  International Journal of Modern Agriculture, Volume 10, No.1,  ISSN: 2305-7246 | A computerization of ranch horticulture framework utilizing a Web of Things (IOT) is proposed. The  framework gives a web interface to the client with the goal that the client can handle and screen the  Framework distantly. This robotized framework can be  valuable for ranchers as they can undoubtedly access and control the framework distantly utilizing their  handheld cell phones | * Lessens human intercession * saves time * upgrades asset   usage   * Expands poultry creation. | * Dependence * Complexity * Security and privacy concerns |
| 9 | Internet of Things (IoT) based Smart Agriculture in India: An Overview  *Dr. V. Suma, Professor, Department of Information Science & Engineering, Dayananda Sagar College of Engineering, Bangalore, India.* | 2021  Journal of ISMAC Vol.03/ No.01 Pages: 1-15 | The IoT system collects and processes the data from the different sensor outputs with centralized processing servers and provides input to green fieldwork devices in real-time. The sensor data created from raw data from soil or any appropriate places and is processed by IoT central processing unit with optimum scheduled time. | * The heterogeneity property provides better accuracy and excellent overall performance of the system * the deep learning analysis increase the production | * Complexity * Security and privacy concerns |
| 10 | Estimation of spectral responses and chlorophyll based on growth stage  effects explored by machine learning methods  *Dehua Gao, Lang Qiao, Lulu An,*  *Ruomei Zhao, Hong Sun, Minzan Li, Weijie Tang , Nan Wang* | 2022  Crop journal in  Crop Science Society of China and Institute of Crop Science, CAAS. | In the field experiment, canopy spectral sampling was conducted representing wheat growth stage of tillering, jointing, booting and heading. Wheat canopy reflectance was measured by an ASD Field Spec Hand Held 2 portable spectro-radiometer. A white panel with 98% reflectance was used for radiation correction. This study explores spectral response on growth stage effects and provides models for  chlorophyll content estimation to satisfy the requirement of high-  Throughput phenotyping. | * It is automatic * It is used in various fields * It can handle varieties of data | * Chances of error or fault are more * Data requirement is more * Time-consuming and more resources required |