|  |  |  |  |
| --- | --- | --- | --- |
| Title | Machine learning enabled IoT system for soil nutrients monitoring and crop recommendation | | |
| Author(s) Name | Md Reazul Islam, Khondokar Oliullah, Md Mohsin Kabir, Munzirul Alom, M.F. Mridha | | |
| Contact Email(s) | reazul@aiub.edu | | |
| Published Journal Name | Journal of Agriculture and Food Research | | |
| Type of Publication | Journal | | |
| Volume | Volume 14 | Issue | null |
| Publisher | Elsevier B.V. | | |
| Publication Date | 23 Dec 2023 | | |
| ISSN | 26661543 | | |
| DOI | https://doi.org/10.1016/j.jafr.2023.100880 | | |
| URL | https://www.sciencedirect.com/science/article/pii/S2666154323003873 | | |
| Other Related Info. | 00880 | | |
|  | | | |

|  |  |
| --- | --- |
| Abstract |  |
| Agriculture plays a vital role in feeding the growing global population. But optimizing crop production and resource management remains a significant challenge for farmers. This research paper proposes an innovative ML-enabled IoT device to monitor soil nutrients and provide accurate crop recommendations. The device utilizes the FC-28 sensor, DHT11 sensor, and JXBS-3001 sensor to collect real-time data on soil composition, moisture, humidity, temperature, and for nutrient levels. The collected data is transmitted to a server using the MQTT protocol. Machine learning algorithms are employed to analyze the collected data and generate customized recommendations, including a possible high-yielding crop list, fertilizer names, and its amount based on crop requirements and soil nutrients. Furthermore, the applied fertilizers and treatments to the field during production are stored in the database. As a result, it has become possible to determine the quality of the produce at the consumer level through the mobile app. The system's effectiveness is evaluated through field experiments, comparing its performance with traditional methods. The results demonstrate the device's ability to enhance crop productivity and optimize resource utilization, promoting sustainable agricultural practices and food security. The research contributes to IoT-enabled agriculture, demonstrating the potential of ML techniques in improving soil nutrient management, facilitating informed decision-making about crop fertilizers, and assessing the quality of produced crops at the consumer level. | |