

IoT in Potato Crop Optimization Using Metaheuristic Algorithms and Deep Learning Applications

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Abstract:

Optimizing potato crop production is crucial for enhancing agricultural sustainability and efficiency. This study proposes an integrated approach utilizing Internet of Things (IoT) technologies, metaheuristic algorithms, and deep learning techniques for potato crop optimization. IoT sensors are deployed in the field to collect real-time data on soil conditions, weather patterns, and crop health. Metaheuristic algorithms, such as genetic algorithms (GA) and particle swarm optimization (PSO), are applied to optimize irrigation, fertilization, and pest management strategies. Additionally, deep learning models, including convolutional neural networks (CNNs), are used to analyze image data for disease detection and yield prediction. Experimental results demonstrate significant improvements in crop yield and resource usage efficiency, offering a scalable solution for smart agriculture.

Keywords:

IoT, potato crop, optimization, metaheuristics, deep learning, smart agriculture.

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