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IoT-Based Feature Selection for Potato Yield Optimization in Smart Agriculture Applications

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Abstract:

The optimization of crop yield is a central challenge in precision agriculture, especially for high-demand crops such as potatoes. This study introduces an IoT-enabled framework that utilizes advanced feature selection techniques to enhance potato yield prediction and decision-making processes in smart agriculture systems. Real-time environmental and soil data—including temperature, humidity, soil pH, and moisture levels—are collected through a network of IoT sensors. These data are then processed using feature selection algorithms such as Recursive Feature Elimination (RFE), Mutual Information, and ReliefF to identify the most influential factors affecting crop productivity. Machine learning models are trained on the selected features to predict optimal farming conditions and support intelligent irrigation, fertilization, and pest control strategies. Results show significant improvements in prediction accuracy and resource efficiency, demonstrating the system's potential to support sustainable and data-driven agricultural practices.

Keywords:

Smart agriculture, IoT, feature selection, potato yield, machine learning, crop optimization.

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