Rice Disease Identification Through Leaf Image and IoT Based Smart Rice Field Monitoring System

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Abstract Rice disease identification in early-stage, proper medication in case of disease affection and managing irrigation at the appropriate time is the most consequential phenomena to increase the production level of the rice. In this paper, a novel technique to diagnose the rice diseases and smart medication prescription system have been proposed. Furthermore, the internet of things (IoT) based smart rice field monitoring system has also been proposed. To identify rice diseases, the leaf image dataset (consists of healthy and three different diseases) has been analyzed through the convolutional neural network (CNN). The obtained rice disease diagnosis accuracy of the proposed system was 98.7%. In a real-time system, the leaf image data has been collected remotely using Raspberry Pi and the data has been sent to a server to be tested by a trained CNN model. Some sensors including soil moisture sensor, pressure sensor, humidity sensor, and temperature sensor have been implanted in the targeted field which aims to record the current scenario of the rice field and send the sensors data to the server. On a web page, proper medications have been displayed if any rice disease identified. Moreover, the user may monitor his field remotely which facilitates irrigation in opportune time.

Keywords IoT · Image processing · Deep learning · Convolutional Neural Networks (CNN) · Leaf disease detection

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