Title: AgriTalk: A Smart Soil Cultivation Using IoT, Big Data and AI

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Abstract:

Today, most lands suitable for farming are already in use. To increase the volume with the limited crop cultivation resources, we need to improve production efficiency through precision farming. IoT, big data and AI techniques have been utilized to improve crop cultivation. However, several issues significantly affect the progress of smart agriculture industry. Some commercial smartg products for agriculture are too expensive. Furthermore, some products are difficult to install and the maintenance costs are high. These issues prevent the farmers from accepting the smart agriculture deployment. This paper proposes AgriTalk, an inexpensive smart platform for precision farming of soil cultivation. This paper uses turmeric cultivation as an example to show how AgriTalk provides precision farming through IoT, big data and AI. Experiments indicate that the turmeric quality is significantly enhanced through AgriTalk. Specifically, the curcumin concentration is up to 4500-5500 mg/100g which is 5 times more than existing products. We demonstrate how to intuitively configure the connections between the sensors and the actuators with the desired farming intelligence, and maintenance of IoT precision farming is effective by using the AgriTalk features. We conduct measurement, analytic analysis, and simulation experiments to investigate the IoT message delays of AgriTalk. Our study indicates that the delays are very short and AgriTalk can easily respond to quick and dynamic change of the field environment conditions in soil cultivation.