Applications of Machine Learning For Precision Agriculture and Smart Farming

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Abstract

Recent deglobalization movements have had a transformative impact and an increase in uncertainty on many industries. The advent of technology, Big Data, and Machine Learning (ML) further accelerated this disposition. Many quantitative metrics that measure the global economy's equilibrium have strong and interdependent relationships with the agricultural supply chain and international trade flows. Our research employs econometrics using ML techniques to determine relationships between commonplace financial indices (such as the DowJones), and the production, consumption, and pricing of global agricultural commodities. Producers and farmers can use this data to make their production more effective while precisely following global demand. In order to make production more efficient, producers can implement smart farming and precision agriculture methods using the processes proposed. It enables them to have a farm management system that provides real-time data to observe, measure, and respond to variability in crops. Drones and robots can be used for precise crop maintenance that optimize yield returns while minimizing resource expenditure. We develop ML models which can be used in combination with the smart farm data to accurately predict the economic variables relevant to the farm. To ensure the accuracy of the insights generated by the models, ML assurance is deployed to evaluate algorithmic trust.