

IMPROVING WATER-USE EFFICIENCY OF IRRIGATION SYSTEMS WITH ML, AND SOIL MOISTURE AND WEATHER DATA

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Machine Learning (ML) and the Internet of Things (IoT) have the potential to increase water use efficiency from traditional irrigation systems. In addition, their combination could make easier the management of data for daily irrigation scheduling. However, ML and IoT research for irrigation scheduling is still limited. There are not many ready-to-use tools that allow to merge data from different sensors into a single comprehensive model, and the ML algorithms still need improvement to predict irrigation on a daily basis. These problems have undermined the farmers' confidence as they need to manage multiple platforms and process complex pieces of data to perform their field management decisions. In this project, we evaluate the efficiency of an adapted Long-Short Term Memory (LSTM) ML algorithm to forecast short-term irrigation recommendations. Data for algorithm training comes from a set of Soil Moisture Sensors (SMS) that collect real time data for three types of sandy soils at a greenhouse setting. In addition, weather data from the Florida Automated Weather Network (FAWN) in Fort Pierce is incorporated. LSTM is compared against three widely used ML algorithms to identify the best ML training algorithm. Results from this ongoing research will provide initial insights for the development of comprehensive irrigation modeling tools that can be easily utilized by citrus growers in southeast Florida.

PRESENTER BIO Eduart Murcia is a first-year graduate research assistant at the University-of-Florida. He holds a bachelor's degree in Agricultural Engineering. His Master Program focuses on developing decision support tools, based on real-time sensor data for irrigation management in specialty crops. His main research interest includes water resources engineering, hydrological-modeling, and extension.