Abstract

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Cultivation-time recommender system based on climatic conditions for newly reclaimed lands in Egypt

This research proposes cultivation-time recommender system for predicting the best sowing dates for winter cereal crops in the newly reclaimed lands in Farafra Oasis, The Egyptian Western Desert. The main goal of the proposed system is to support the best utilization of farm resources. In this research, predicting the best sowing dates for the aimed crops is based on weather conditions prediction along with calculating the seasonal accumulative growing degree days (GDD) fulfillment duration for each crop. Various Machine Learning (ML) regression algorithms have been used for predicting the daily minimum and maximum air temperature based on historical weather conditions data for twenty-five growing seasons (1990/91 to 2014/15). Experimental results showed that using the M5P and IBk ML regression algorithms have outperformed the other implemented regression algorithms for predicting the daily minimum and maximum air temperature based on historical weather conditions data. That has been measured based on the calculated mean absolute error (MAE). Also, obtained experimental results obviously indicated that the best cultivation-time prediction by the proposed recommender system has been achieved by the M5P algorithm, based on the seasonal accumulative GDD fulfillment duration, for the coming five growing seasons (2016/17 to 2019/20).