

Machine Learning Predictive Models for Hydroponic Systems: A Case Study Nutrient Film Technique and Deep Flow Technique

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Abstract : Machine learning algorithms (MLAs) such as artificial neural networks (ANNs), decision tree, support vector machines (SVMs), Naïve Bayes, and ensemble classifier by voting are powerful data driven methods that are relatively less widely used in the mapping of technique of system, and thus have not been comparatively evaluated together thoroughly in this field. The performances of a series of MLAs, ANNs, decision tree, SVMs, Naïve Bayes, and ensemble classifier by voting in technique of hydroponic systems prospectively modeling are compared based on the accuracy of each model. Classification of hydroponic systems only covers the test samples from vegetables grown with Nutrient film technique (NFT) and Deep flow technique (DFT). The feature, which are the characteristics of vegetables compose harvesting height width, temperature, require light and color. The results indicate that the classification performance of the ANNs is 98%, decision tree is 98%, SVMs is 97.33%, Naïve Bayes is 96.67%, and ensemble classifier by voting is 98.96% algorithm respectively.

Keywords : artificial neural networks, decision tree, support vector machines, naïve Bayes, ensemble classifier by voting

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