

Deep Learning to Predict Plant Growth and Yield in Green House Environment

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Abstract: *Effective plant growth and yield prediction is an essential task for greenhouse growers and for agriculture in general. Developing models which can effectively model growth and yield can help growers improve the environmental control for better production, match supply and market demand and lower costs. Recent developments in Machine Learning (ML) and, in particular, Deep Learning (DL) can provide powerful new analytical tools. The proposed study utilities ML and DL techniques to predict yield and plant growth on Ficus Benjamin stem growth, in controlled greenhouse environments. We deploy a new deep recurrent neural network (RNN), using the Long Short-Term Memory (LSTM) neuron model, in the prediction formulations. Both the former yield, growth and stem diameter values, as well as the microclimate conditions, are used by the RNN architecture to model the targeted growth parameters. A comparative study is presented, using ML methods, such as support vector regression and random forest regression, utilizing the mean square error criterion, in order to evaluate the performance achieved by the different methods.*

Keywords: Machine learning, data set, web scraping, stem diameter, prediction, deep learning, recurrent LSTM neural networks

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