Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem - 533437

DEPARTMENT OF INFORMATION TECHNOLOGY

B. Tech 4/4, II-SEMESTER

II Semester 2020-21

PREDICTION OF PLANT GROWTH AND YIELD IN GREENHOUSE ENVIRONMENTS

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 utilizes ML and DL techniques to predict yield and plant growth variation across two different scenarios, tomato yield forecasting and 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.

Signature of the Guide

Course Outcomes (COs)

Course Outcomes

After completing this course, the student will be able to:

CO Number	CO Statement	Taxonomy
CO1	Demonstrate the technical knowledge to identify problems in the field of Information Technology and its allied areas.	Understand
CO2	Use literature to identify the objective, scope and the concept of the work.	Apply
CO3	Analyze and formulate technical projects with a comprehensive and systematic approach.	Analyse
CO4	Identify the modern tools to implement technical projects.	Evaluate
CO5	Design engineering solutions for solving complex engineering problems.	Create
CO6	Develop effective communication skills, professional behaviour and team work.	Understand

Signature of the Guide

CO-PO/PSO MATRIX:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1			1			3	2	2	2	3	2	
CO2	2	1	2	2	1	1		1	3	2	2	2	3	3	1
CO3	1	1	3	3	1	1			3	2	2	2	3	2	1
CO4	2	1	1	2	3	1		2	3	2	2	2	2	1	2
CO5	2	2	3	3	2	1		1	3	2	3	2	3	1	1
CO6	1	1	1	2	1	1		1	2	3	2	2	3	2	1
Course	1.8	1.3	1.8	2.0	1.3	1.0	0.0	0.8	2.8	2.2	2.2	2.0	2.8	1.8	1.0

PO1	Engineering Knowledge	PO7	Environment & Sustainability
PO2	Problem Analysis	PO8	Ethics
PO3	Design / Development of Solutions	PO9	Individual & Team Work
PO4	Conduct Investigations of complex problems	PO10	Communication Skills
PO5	Modern Tool usage	PO11	Project Management & Finance
PO6	Engineer & Society	PO12	Life-long Learning

Signature of the Guide