Review on the Integration of Deep Learning and Natural Language Processing for Intelligent Crop Management

Lavanya N Moger, Navya Y R, Nikitha Shetty, Sukanya Patil
Information Science and Engineering(VTU)
Alva's institute of Engineering and Technology (VTU), Dakshina, Kannada, India

Abstract: *The rapid advancement in artificial intelligence, particularly in deep learning and natural language processing (NLP), has significantly transformed the landscape of smart agriculture. One of the most promising applications of these technologies lies in plant growth monitoring systems, which are critical for ensuring optimal crop health, yield prediction, and sustainable farming practices. This review paper explores the convergence of deep learning techniques—such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs)—with NLP approaches to develop intelligent and adaptive plant monitoring frameworks. We examine existing methodologies, analyze their performance across various datasets, and highlight the limitations of conventional image and sensor-based systems. Furthermore, we discuss how NLP can facilitate seamless model-to-model communication, automate the interpretation of plant growth data, and generate meaningful insights for end users. By synthesizing current trends, research gaps, and emerging innovations, this paper aims to provide a comprehensive understanding of how AI-powered solutions can revolutionize plant growth analysis and contribute to the future of precision agriculture*

Keywords: Plant Growth Monitoring, Deep Learning, Natural Language Processing, Model-to-Model Communication, Image-Based Analysis, Intelligent Crop Management, Semantic Interpretation, Convolutional Neural Networks, Precision Agriculture, Automated Feedback Systems

Copyright to IJARSCT
www.ijarsct.co.in

DOI: 10.48175/IJARSCT-27765

490

ISSN
2581-9429
IJARSCT