NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Batch Number	AB-06
Team Members	K. Venkata Ramesh (**22471A0533**) B. Surya Prasad (22471A0557) T. Nagaiah (22471A0561) Sk. Abdhul Nabi (22471A0547)
Guide	Shaik Rafi M. Tech
Title	**Towards Smarter Agriculture: Deep Learning-Based Multistage Detection of Leaf Diseases**
Domain/Technology	DEEP LEARNING
Base Paper Link	**https://ieeexplore.ieee.org/document/10414062**
Dataset Link	**https://www.kaggle.com/datasets/vipooooool/new-plant-diseases-dataset/data**
Software Requirements	Browser: Any latest browser like Chrome Operating System: Windows 7 Server or later Python (COLAB)
Hardware Requirements	SystemType: Intel Core i5 or above RAM: 8 GB Number of cores:5 Number of Threads: 4
Abstract	Agriculture is vital for global food security, especially with the population increasing by 0.88% since 2022. Plant diseases threaten crop production, causing about 14.1% annual global crop loss. Early and accurate disease detection is essential, yet the lack of high-quality, unprocessed datasets limits automated diagnosis. This study develops dedicated datasets for rice, wheat, and maize, capturing common leaf diseases (two bacterial and two fungal for rice, and four fungal for each maize and wheat). Eight fine-tuned deep learning models were evaluated with identical settings. Exception and MobileNet performed best for maize (0.9580, 0.9464), MobileNetV2 and MobileNet for wheat (0.9632, 0.9628), and exception and InceptionV3 for rice (0.9728, 0.9620). A custom CNN trained from scratch achieved accuracies of 0.9704, 0.9706, and 0.9808 on maize, rice, and wheat datasets, respectively.

Signature of the Student(s)   **Signature of Guide**   **Signature of the project coordinator**