Department of Computer Sc. & Engg, Govt. Engg. College – Thrissur
SEMINAR PROPOSAL
2025-2026 ODD SEM

1. **Name of the student:** Devangana K
2. **Uni. Reg. No:** TCR22CS024 **Program:** B.Tech. CSE **Batch:** 2022 Admn.
3. **Guided by:** Prof Ali Akbar N assosciate proffessor
4. **Broad area:** Plant multi disease detection using deep learning
5. **Sub area:** Deep learning and Image processing using CNN
6. **Seminar Title:** Plant multi disease detection using deep learning
7. **Objectives of seminar:**

   O1: To explore the application of Convolutional Neural Networks (CNNs) for detecting and classifying multiple plant diseases with high accuracy.

   O2: To understand the current challenges in early disease identification in crops and how deep learning techniques can address them.

   O3: To evaluate existing datasets and models used in plant disease detection and analyze their performance metrics.

   O4: To study the integration of deep learning with computer vision for practical deployment in precision agriculture.

   O5: To study how transfer learning and ensemble modeling improve classification accuracy in agricultural settings.

   O6: To gain insights into the creation of robust, scalable, and practical AI systems for real-time plant health monitoring in smart agriculture.

8. **Related works:**
   (Name at least three related journal references - put cross reference number on the side)

   (a) Comparative analysis of different plant leaf disease classification and detection using CNN:

   This paper primarily presents a robust approach for detecting plant diseases in real-world field images by integrating the Segment Anything Model (SAM) for object segmentation and Fully Convolutional Data Description (FCDD) for anomaly detection. It addresses the limitations of traditional models trained on laboratory datasets, which fail to perform well on complex field images with multiple overlapping leaves and varied backgrounds.

   (b) Multi-Plant Leaf Disease Detection and Classification using CNN:

   This research proposes a machine learning-based system for detecting and classifying plant diseases using Convolutional Neural Networks (CNNs) and image processing techniques. The study focuses on identifying diseases in globally recognized crops—tomato, potato, and pepper—using a dataset collected from PlantVillage, consisting of over 20,000 images.

(c) Comparative analysis of different plant leaf disease classification and detection using CNN:

This paper primarily presents a comparative analysis of Convolutional Neural Network (CNN) architectures for the detection and classification of leaf diseases in two major crops—maize and soybean. The work highlights the growing need for accurate, efficient, and automated plant disease detection methods to ensure food security and support modern agriculture.

(d) Identification of Different Medicinal Plants Through Image Processing:

This paper presents a robust, automated system for identifying medicinal plants and raw materials using machine learning and deep learning techniques. Leveraging models such as ResNet-50 and Random Forest, the system accurately classifies plant images and integrates a leaf disease detection module built using Keras. The research addresses challenges in traditional plant identification methods, such as time consumption and reliance on expert evaluation, by offering a faster, more reliable solution through image processing and algorithmic classification

9. **Abstract finalised:**

Early and accurate detection of plant diseases in real-world field conditions is a critical challenge in modern agriculture. Traditional machine learning models, typically trained on lab-captured datasets like PlantVillage, fail to generalize well on complex field images due to varying backgrounds, lighting conditions, and overlapping leaves. This paper introduces a robust, multi-stage model ensemble that significantly improves disease detection accuracy on field images. The proposed approach utilizes the Segment Anything Model (SAM) to identify and isolate all potential objects within an image, followed by Fully Convolutional Data Description (FCDD), an explainable deep one-class classification model that filters out non-leaf objects. The refined leaf regions are then passed to a CNN-based disease classifier trained on the PlantVillage dataset. This system allows for both single-leaf and multi-leaf disease detection within the same image, addressing the limitations of conventional models. Experimental results on benchmark datasets like PlantDoc show a performance improvement of over 10

10. **Scheduled date of presentation:**

11. **References:**

[1] Ratnam Dodda, K. Ambika, Sravan Kumar G., Sunitha Maddhi, Kotoju Neelima, and Marri Sandya Rani. Automated plant disease detection and prevention using raspberry pi and cnn algorithm. In *Conference on Artificial Intelligence in Agriculture*. CVR College of Engineering, 2024.

[2] Nitin Lokhande, Vijaya Thool, and Pratap Vikhe. Comparative analysis of different plant leaf disease classification and detection using cnn. In *2023 International Conference on Recent Advances in Science & Engineering Technology (ICRASET)*. IEEE, 2023.

[3] Aishwarya S. S, Chaithra I. V, Pushpa Ravikumar, and Deeksha Sagar. Multi-plant leaf disease detection and classification using convolution neural network and image processing. In *National Conference on Emerging Trends in Computer Science*. Adichunchanagiri Institute of Technology, 2024.

[4] J. Anvar Shathik, S. Hashini, A. Pandiaraj, N. Ramshankar, Naveen G, and Amirthavarshini K. B. Identification of different medicinal plants through image processing. *International Journal of Image Processing and AI*, 12(2), 2024.

12. **Approval note of Guide:**

Date of approval:15.07.2025

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