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**Project on**

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*In*

# ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

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**(An Autonomous Institute)**

**Accredited with NAAC “A” Grade**

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**Leaf Classifier: Development of Plant Species Identification Model with Transfer Learning**

ABSTRACT

The Leaf Classifier project aims to leverage deep learning techniques, specifically utilizing the EfficientNetB3 model in TensorFlow, to create an efficient plant species identification model. This model will be capable of accurately classifying plants based on their visual characteristics. The system has been designed to categorize plants into seven types, namely crops, fruits, industrial plants, medicinal plants, nuts, tubers, and vegetable plants. The application of transfer learning using the pre-trained EfficientNetB3 model allows for the development of a robust and accurate classification system.

**Outline Objectives**:

The outlined objectives of the project include leveraging a large and diverse dataset (30,000 images, 30 species) for plant species identification, categorizing plants into 7 types for practical classification, implementing robust data preprocessing and augmentation techniques, and deploying the Efficient Net B3 model to enhance accuracy. Additionally, the project aims to provide informative insights about predicted plants, enriching the user experience and educational value of the application.

**Methodology**:

The project employs transfer learning, a technique that leverages the knowledge gained by a pre-trained model on a large dataset and fine-tunes it for a specific task. The EfficientNetB3 model, known for its efficiency and accuracy, forms the backbone of the classification system. The model is trained and fine-tuned on a dataset comprising images of various plant species.

**Key findings**:

The project's key findings highlight substantial improvements in plant species identification through the use of a diverse dataset and the adoption of EfficientNetB3. Categorizing plants into distinct types enhanced practical utility. Robust data preprocessing techniques contributed to the model's adaptability, and the inclusion of comprehensive plant information enriched the overall user experience, making the system both efficient and informative.

**Key words**:

EfficientNetB3 Model, Transfer Learning, Deep Learning, Dataset Diversity, Categorization, classification accuracy, predicted plant information, user experience, educational value.