S. B. JAIN INSTITUTE OF TECHNOLOGY, MANAGEMENT & RESEARCH, NAGPUR.
(An Autonomous Institute, Affiliated to RTMNU, Nagpur)
DEPARTMENT OF EMERGING TECHNOLOGIES (AI&ML and AI&DS)
"Become an excellent center for Emerging Technologies in Computer Science to create competent professionals"

IDENTIFICATION OF DIFFERENT MEDICINAL PLANTS/RAW MATERIALS THROUGH IMAGE PROCESSING USING MACHINE LEARNING ALGORITHMS

Group no.: 11
Semester: 6
Branch : AI-DS
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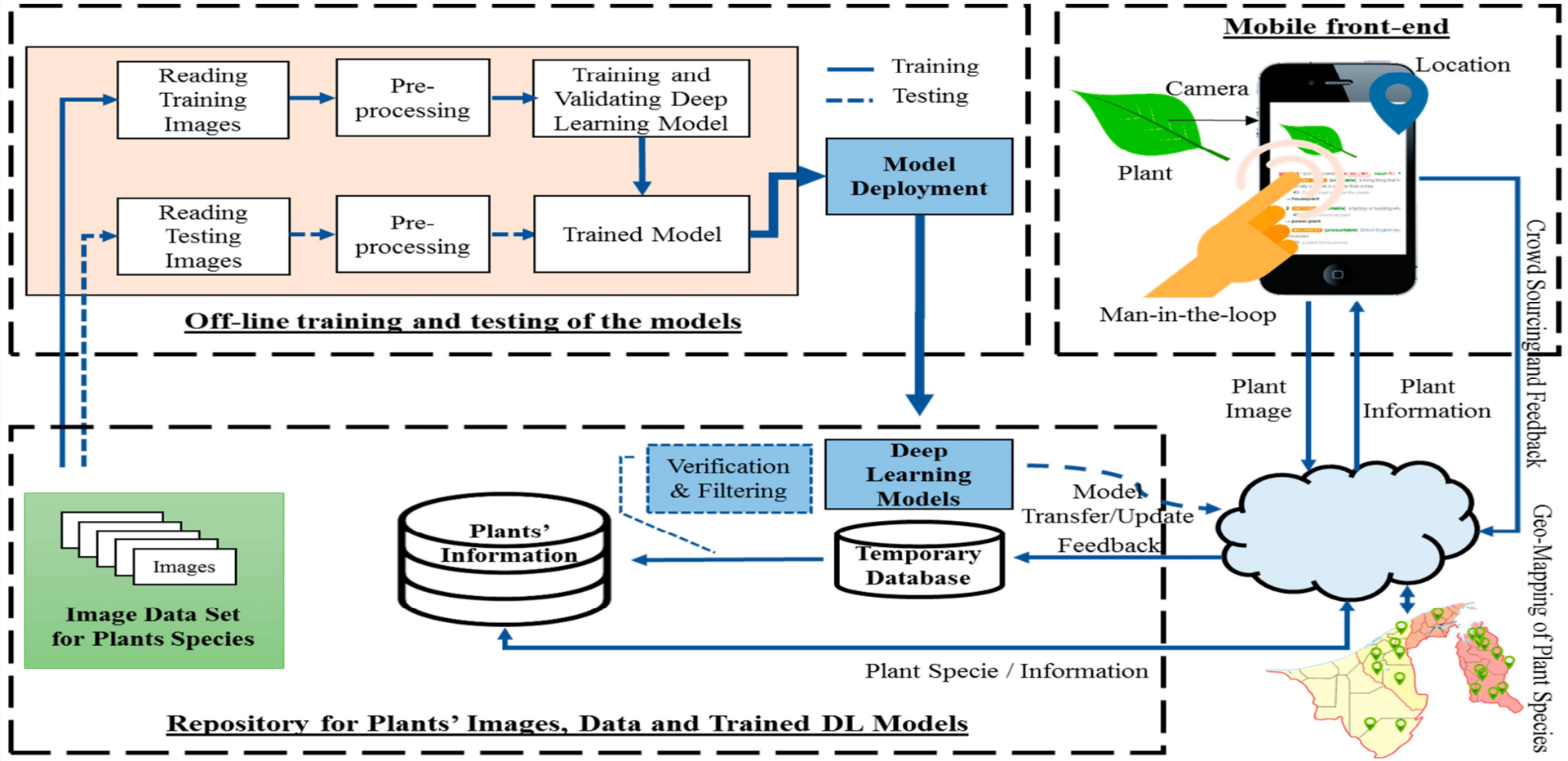
Introduction

- India, with a rich heritage of floral diversity, is well-known for its medicinal plant wealth, but their identification is one of the major burning issues in Ayurvedic Pharmaceutics.
- Several crude drugs are being sold under the same name in the market leading to confusion and their misidentification.
- The collectors and traders are not completely aware of the exact morphological appearance or differentiating attributes of the many drugs owing to seasonal and geographical availability, and similar characteristics.
- We are going to develop software capable of identifying different medicinal plants/ raw materials through Image Processing Using Different Machine Learning Algorithms.

System Diagram



Objectives

- **Identification Accuracy**: Improve the accuracy of identifying medicinal plants and raw materials, reducing instances of misidentification, confusion, and substitution in the market.
- **Resource Management**: Help manage the rich floral diversity of India by providing a tool to identify plants accurately, thus promoting sustainable harvesting practices.
- **Supply Chain Efficiency**: Enhance the efficiency of the supply chain by ensuring that wholesalers, distributors, and other stakeholders can accurately identify raw materials at different stages of the supply chain.
- **Adulteration Prevention**: Combat adulteration and substitution practices by providing a reliable means to authenticate the identity of medicinal plants and raw materials.
- **Promotion of Ayurvedic Pharmaceutics**: Foster trust and belief in the curative capabilities of Ayurvedic medicine by ensuring the authenticity and quality of raw materials used in the production process.

Methodology

STEP 1

Data Integration

Process that combines and unifies data from various sources.

STEP 2

Data Augmentation

Technique used to increase the size and diversity of a dataset and helps improve performance

STEP 3

Data Preprocessing

Involves Cleaning, transforming , organizing raw data
&
Here it will remove the background of the image, the resigning of the image

STEP 4

Pre-trained Models

Often used as a starting point for developing ML models, as they provide a set of initial weights and biases that can be fine-tuned for a specific task.

STEP 5

Average Ensemble Models

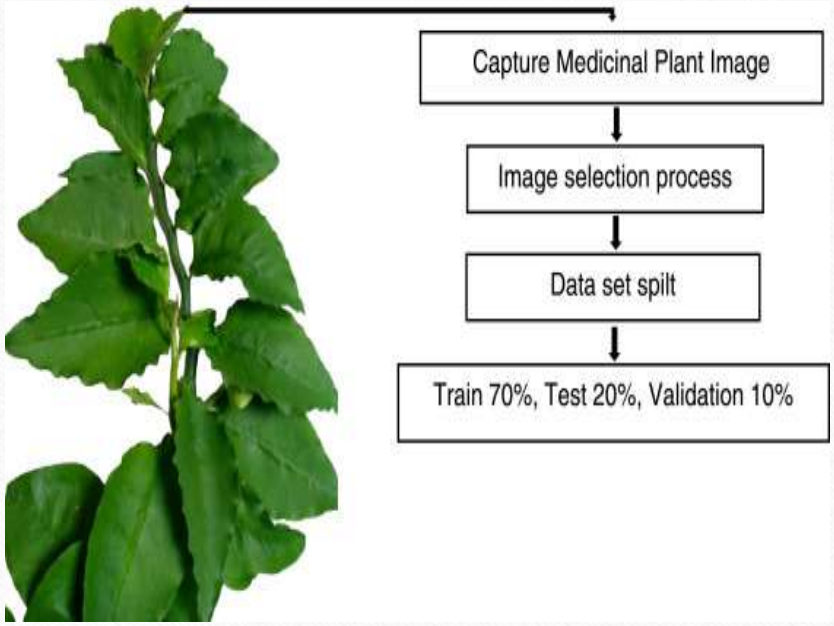
Used to improve the accuracy of predictions

Expected Outcomes

- ❑ Increased Accuracy
- ❑ Enhanced Efficiency
- ❑ Improved Resource Management
- ❑ Adulteration Prevention
- ❑ Promotion of Traditional Medicine
- ❑ Research and Innovation
- ❑ Capacity Building

Challenges

- ❑Lack of Medicinal Plant Image Datasets
- ❑Unknown Plant Leaves
- ❑Training Time
- ❑Lack of GPU
- ❑Similar Plant with Different Characteristic



Research Papers

- **Title**:A method of two-dimensional correlation spectroscopy combined with residual neural network for comparison and differentiation of medicinal plants raw materials superior to traditional machine learning: a case study on Eucommia ulmoides leaves

  Author:Yuan Zhong Wang (2022)

- **Title:** Trends and Application of Chemometric Pattern Recognition Techniques in Medicinal Plants Analysis

  Author: Mariana Gaião Calixto (2021)

- **Title:** A survey of image processing techniques for plant extraction and segmentation in the field

  Author: E.Hamuda

- **Title:**Review of Plant Identification Based on Image Processing

  Author: Zhaobin Wang (2016)

- **Title**:Digital image processing techniques for detecting, quantifying and classifying plant diseases

  Author: Jayme Garcia Arnal Barbedo

Thank You