IDENTIFICATION OF MEDICINAL PLANTS USING CNN

"NATURENEXUS"

Problem Statement: Identification of Different Medicinal Plants/Raw materials through Image Processing Using Machine Learning Algorithms.

Objective: Create an AI-powered mobile app to accurately identify medicinal plants and raw materials, promoting transparency and trust in Ayurvedic Pharmaceutics.

Target Audience: Herbalists, traditional medicine practitioners, collectors, traders, wholesalers, and distributors in the Ayurvedic Pharmaceutics supply chain.

Procedure:

1. **Data Collection:** Collect data of images from internet resources and real images capturing. We are also collecting the data for the key features like description, seasonal availability, usage, advantage, company etc. (For additional insights regarding plant or raw material).

   Categorize data into classes according to the plant's species and raw materials.

2. **Pre-processing:** Preprocess the data to be used in building a Machine learning (ML) model.

   Build a deep learning model that can predict the type of the medicinal plant and raw material.

3. **Feature Extraction:** Advanced computer vision techniques are applied to extract essential features from the images, capturing unique characteristics of each plant or raw material.
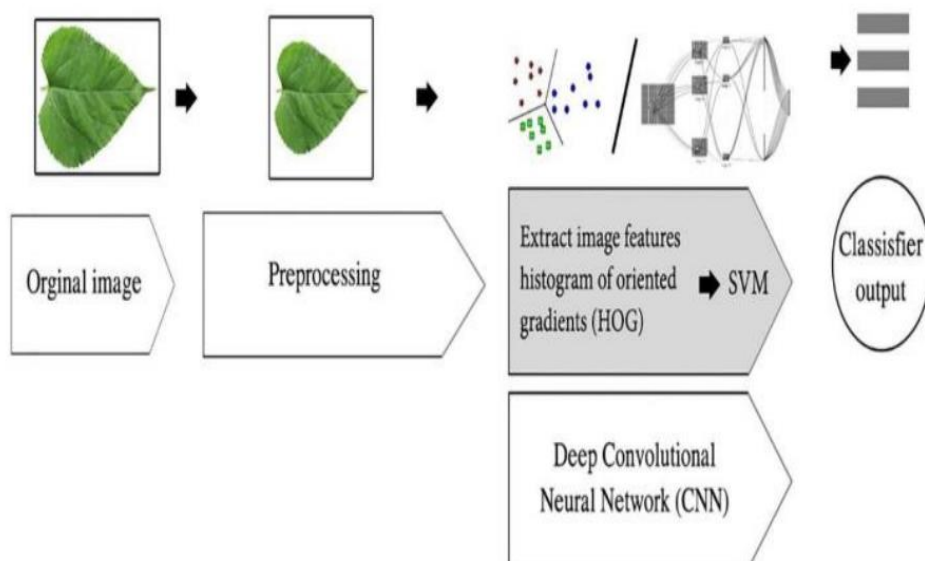
4. **Machine Learning Algorithms:** The application utilizes a range of machine learning algorithms, including Convolutional Neural Networks (CNNs) and other models, to classify and identify the plant or raw material based on the extracted features.
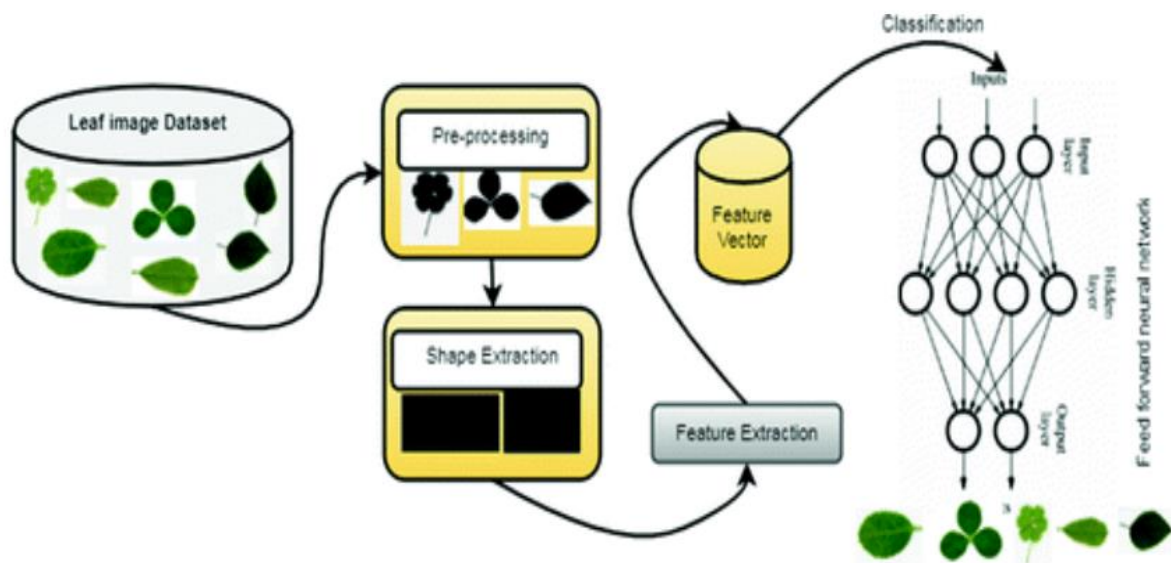
5. **User-Friendly Interface:** The app offers an intuitive and user-friendly interface, making it accessible to various stakeholders in the supply chain, such as wholesalers and distributors.
6. **Real-Time Results:** Users receive real-time identification results, along with detailed information about the medicinal properties, usage, and potential substitutes of the identified plant or material.
7. **Data Enrichment:** Collaboration with experts, herbalists, and botanists ensures the continuous enrichment of the system's database, improving accuracy over time.

Result/Solution:

-Leverages cutting-edge computer vision algorithms for highly accurate identification of medicinal plants and raw materials through image recognition.

-User-friendly software solution.

-Combines precise plant identification via image recognition with an extensive database encompassing botanical details, usage insights, and manufacturer information.

-Mitigating the risk of adulteration, ensuring transparency in the supply chain, empowering users with accurate identifications, and bolstering the preservation of biodiversity.

-This transformative tool features an intuitive interface for seamless integration into various user workflows, fostering accessibility and usability across the traditional medicine ecosystem.

-In our pursuit of an effective solution for the identification of plants and raw materials using Convolutional Neural Networks (CNNs), we leveraged a comprehensive dataset from Kaggle, encompassing 82 distinct plant classes. Our trained DL model has yielded remarkable outcomes, achieving an impressive accuracy rate of approximately 86.8%. We are utilizing various machine learning algorithms and models to optimize performance and provide the best possible results for solving problem.
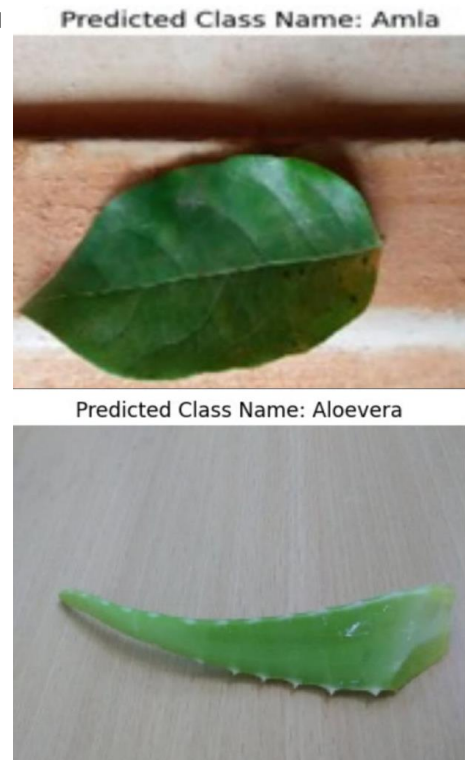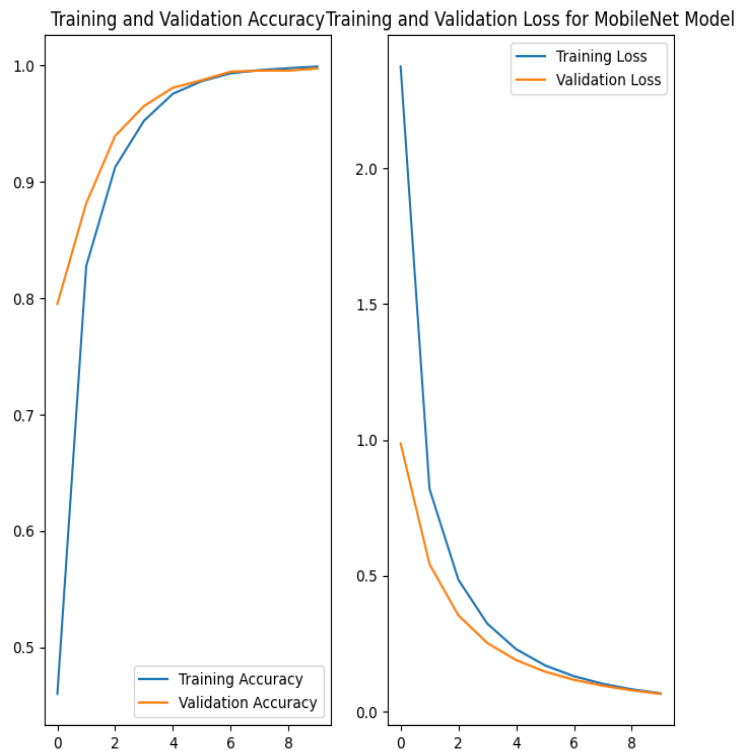
Results from one CNN trained model for identification of plants and raw materials

Conclusion:

In conclusion, our innovative solution, combining robust image collection of medicinal plants and raw materials with comprehensive data augmentation, stands as a formidable tool poised to revolutionize the traditional medicine landscape. By providing precise identifications, insightful information, and fostering transparency, it empowers users and stakeholders alike, reinforcing trust, reducing the risk of adulteration, and preserving the rich heritage of medicinal knowledge.