

TEAM HACKSTREET BOYSSSS

AYURVEDIC LEAF DETECTION SYSTEM

HEALTHCARE DOMAIN





PROBLEM STATEMENT

The field of Ayurvedic medicine heavily relies on the accurate identification of medicinal plants and herbs for effective therapeutic treatments. However, manual plant identification is time-consuming and error-prone, leading to potential misdiagnoses and treatment inefficiencies. To address this challenge, there is a need for an automated Ayurvedic Leaf Detection System that leverages machine learning and deep learning techniques to accurately identify and classify medicinal plant leaves, thereby enhancing the precision and efficiency of Ayurvedic herbal treatments.



INTRODUCTION

AYURLEAFAI (AYURVEDIC LEAF DETECTION SYSTEM)

The AyurLeafAI(Ayurvedic Leaf Detection System) represents a harmonious fusion of modern technology and ancient herbal wisdom. Through the application of artificial intelligence and advanced image analysis, this innovative system provides precise identification of medicinal plant leaves central to Ayurvedic medicine. By seamlessly integrating traditional knowledge with contemporary tools, it offers the potential to revolutionize herbal medicine, enabling practitioners to identify and utilize specific plant species accurately, thereby enhancing the efficacy and safety of Ayurvedic treatments for holistic well-being.

IDEA/APPROACH DETAIL

Creating an Ayurvedic Leaf Prediction System involves leveraging machine learning and Ayurvedic knowledge to recommend plants and herbs for specific health conditions or Ayurvedic constitution types. Here's a detailed approach to building such a system:

1. DATA COLLECTION:

- Gather a comprehensive dataset of Ayurvedic leaf images
- Compile information on plants, herbs, their properties, and their traditional uses in Ayurveda.
- Collect data on health conditions, symptoms, and Ayurvedic constitution types (Vata, Pitta, Kapha).

2. DATA PREPROCESSING:

- Clean and preprocess the data to ensure consistency and accuracy.
- Annotate the data with relevant tags, such as plant names, properties, therapeutic uses, and constitution type associations.

3. MACHINE LEARNING MODEL:

- Choose an appropriate machine learning approach deep learning.
- Train a model to understand the relationships between plants, health conditions, and constitution types based on the annotated dataset.



IDEA/APPROACH DETAIL

4. FEATURE ENGINEERING:

- Extract meaningful features from the images of the medicinal plant leaf.

5. USER INTERFACE:

- Create a user-friendly interface (web application) for users to interact with the system.
- Allow users to input the images of leaf and classify which medicinal plants leaf is it and its medicinal uses.

6. VALIDATION AND TESTING:

- Evaluate the model's accuracy and performance through rigorous testing.

7. SAFETY AND ACCURACY:

- Ensure that the system provides safe recommendations by cross-referencing with known contraindications and possible herb-drug interactions.
- Continuously update the database to reflect new research and discoveries in Ayurveda.



IDEA/APPROACH DETAIL

8. INTEGRATION WITH KNOWLEDGE BASE:

- Link the system to an extensive knowledge base that provides additional information about each recommended plant, including dosage, preparation methods, and potential side effects.

9. MONETIZATION AND SUSTAINABILITY:

- Consider various monetization options, such as premium features, subscriptions, or partnerships with Ayurvedic practitioners or wellness centers.



TECHSTACK USED

FRONT END

STREAMLIT FOR FRONT END DEPLOYMENT

IDE USED

Visual Studio Code
Jupyter Notebook

BACKEND

Python

Machine Learning and Deep Learning Algorithms Used:

1. CNN(Convolutional Neural Network)
2. Data Preprocessing
3. Data Augmentation
4. Image Processing Using TensorFlow
5. Feature Engineering

PRESENTATION

Figma for System Architecture
Canva for presentation

UI UX DESIGN (STREAMLIT)

Deploy

 Predict

 About

AyurLeafAI

Upload an image...



Drag and drop file here

Limit 200MB per file • JPG, PNG, JPEG

Browse files



neemkapatta.png 219.4KB

X

UI UX DESIGN (STREAMLIT)

Deploy

Uploaded Image

Predict

Predicted Ayurvedic Leaf :- Azadirachta Indica (Neem)

Accuracy = 100.00 %

Medicinal Uses

Neem leaf is used for leprosy, eye disorders, bloody nose, intestinal worms, stomach upset, loss of appetite, skin ulcers, diseases of the heart and blood vessels (cardiovascular disease), fever, diabetes, gum disease (gingivitis), and liver problems. The leaf is also used for birth control and to cause abortions.

UI UX DESIGN (STREAMLIT)

 RUNNING... Stop Deploy

 Predict

 About

What is AyurLeafAI ?

Ayurvedic Plant Species Identification involves the meticulous recognition of various plants used in Ayurvedic medicine based on their unique botanical characteristics. This knowledge is essential for ensuring the safety and effectiveness of herbal remedies. Once a plant is accurately identified, its leaves, among other parts, are often utilized for their medicinal properties.

For instance, in Ayurveda, the identification of Neem leaves (*Azadirachta indica*) is crucial. Neem leaves are recognized by their pinnate structure with small, serrated leaflets. These leaves are renowned for their powerful antimicrobial and anti-inflammatory properties. They are commonly used in Ayurvedic remedies to treat skin conditions like acne and eczema, as well as to promote overall detoxification and immune system support. Additionally, Neem leaves are used in oral hygiene practices for their antibacterial effects, making them a versatile and highly valued herb in Ayurvedic medicine.

How it works ?

AyurLeafAI, using machine learning, employs a data-driven approach to identify and analyze the unique characteristics of Ayurvedic leaves. It begins by collecting a dataset of leaf images and their corresponding Ayurvedic properties. Machine learning algorithms are then trained on this data to recognize patterns, such as color, shape, and texture, which are indicative of medicinal qualities. When a user submits a leaf image, the system processes it through these algorithms, comparing it to the learned patterns. It then predicts the potential medicinal properties, helping users identify the therapeutic benefits of the leaf based on Ayurvedic principles, promoting natural and holistic healthcare choices.



UI UX DESIGN (STREAMLIT)



Fig : System Architecture of AyurLeafAI

Sample plant images

Alpinia Galanga (Rasna)

Sample 1



Sample 2



Sample 3



Sample 4



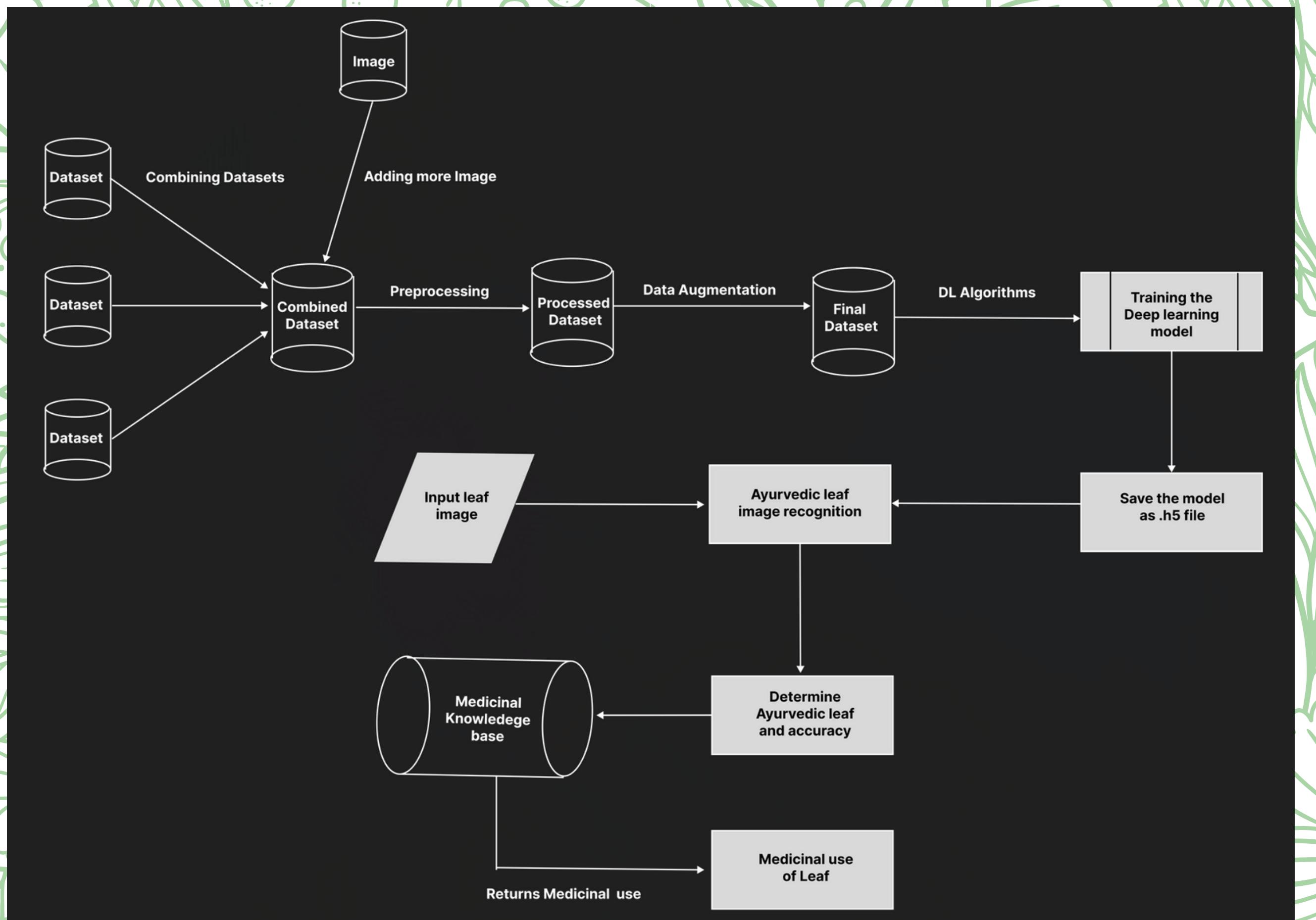
Sample 5



Amaranthus Green

Sample 5

SYSTEM ARCHITECTURE



TEAM MEMBER DETAILS

- 1 Team Leader - Krishay Santosh Nair (Rajiv Gandhi Institute of Technology)**
- 2 Group Member - Om Santosh Bhambale (Rajiv Gandhi Institute of Technology)**
- 3 Group Member - Shantanu Tilak Gondane(Rajiv Gandhi Institute of Technology)**
- 4 Group Member - Kartik Jignesh Mistry (Rajiv Gandhi Institute of Technology)**



THANK
YOU!

