
Flora MD

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Flora MD is a cutting-edge plant disease detection and solution model utilizing CNN technology. It goes beyond language barriers by offering solutions in all Indian regional languages. With its user-friendly chatbot interface, farmers receive personalized assistance and recommendations in real-time. Additionally, Flora MD keeps farmers informed with the latest agricultural news, ensuring they stay ahead of emerging challenges. Empowering farmers across India, Flora MD is revolutionizing crop management with its accessibility and expertise.

Problem Statement

Developing an accurate and efficient plant disease detection model is crucial for sustainable agriculture. The current challenge lies in creating a system that can reliably identify and classify various plant diseases from images, providing farmers with timely information for proactive disease management. Factors such as diverse environmental conditions, image quality variations, and the need for real-time diagnosis pose significant hurdles in achieving a robust and practical solution. The goal is to design a model that can address these challenges, offering farmers a reliable tool to monitor and combat plant diseases effectively.

PROPOSED OBJECTIVES

1. Enhance Disease Detection Accuracy: Develop advanced algorithms and integrate state-of-the-art image recognition technology to improve the accuracy of plant disease detection within the app. By leveraging machine learning techniques and continuously updating the database with new disease patterns, the app will provide more reliable diagnoses, aiding farmers in prompt and precise treatment.

2. Personalized Assistance and Recommendations: Enhance the chatbot functionality to provide tailored assistance and recommendations based on individual user queries and specific plant health issues. By analyzing user inputs and historical data, the chatbot will offer personalized solutions, guiding farmers through treatment options and preventive measures suitable for their crops and geographic regions.

3. Comprehensive Agricultural News Integration: Expand the news page integration to provide a comprehensive source of agricultural news, research updates, and market trends relevant to farmers. By curating content from reputable sources and employing natural language processing algorithms, the app will deliver timely and relevant information, enabling farmers to stay informed about emerging threats, innovative techniques, and industry developments impacting their crop management practices.

ABSTRACT

This project introduces an innovative approach to plant disease detection and solution, leveraging Convolutional Neural Networks (CNNs) for accurate identification of plant diseases. Users can upload their own images for analysis, facilitating easy and accessible disease detection. The primary objective is to provide timely and precise identification of plant diseases, enabling proactive intervention and improved crop health. The project encompasses various components, including feature extraction, CNN algorithms, and real-time processing techniques tailored to efficiently detect early signs of plant diseases.

To address the challenge of data labeling, the project employs a human-driven approach, ensuring high-quality labeled data for robust model training and accuracy. Extensive experiments are conducted using uploaded images to evaluate the project's efficacy, demonstrating its superiority over existing plant disease prediction models. It achieves high accuracy while minimizing false positives, indicating its potential for practical deployment in agricultural settings.

This project significantly contributes to the development of a practical and effective plant disease detection and solution system with real-world applications. By enabling users to upload their own images for analysis and leveraging human labeling expertise, the project offers a user-friendly solution for early detection of plant diseases, thereby promoting crop health and agricultural sustainability.

BACKGROUND STUDY

Automatic and reliable leaf disease detection using deep learning techniques The research paper focuses on addressing plant diseases, which lead to significant food production losses, through the early detection of diseases using computer vision and artificial intelligence. The proposed approach employs the Efficient Net architecture based on a convolutional neural network (CNN) to classify tomato diseases. Two segmentation models, U-net and Modified U-net, are utilized for leaf segmentation, and the performance of the models is evaluated for binary, six-class, and ten-class classifications. The study reports high accuracy for disease classification, surpassing existing literature, especially when trained with deeper networks on segmented images.

LIMITATIONS :

1. Dataset Specificity: The paper mentions using 18, 161 plain and segmented tomato leaf images, but it doesn't elaborate on the diversity and representativeness of the dataset. The performance of the models might be influenced by the dataset's specific characteristics and limited diversity

2. Generalization to Other Crops: The focus on tomato leaf images may limit the generalizability of the proposed approach to other crops. The paper could benefit from discussing potential challenges in applying the model to different plant species.

3. Limited Evaluation Metrics: While the paper reports accuracy, Jab, and Dice score for segmentation, it doesn't delve into other evaluation metrics or discuss potential limitations associated with these metrics in capturing the model's overall performance.

4. Computational Resource Requirement: The paper does not provide insights into the computational resources required for training and deploying the deep learning models. Scalability and resource constraints may be significant considerations for practical implementation

5. Real-world Deployment Challenges: The study primarily focuses on model performance metrics, and there is limited discussion on the practical challenges and considerations for deploying the proposed system in real-world agricultural settings.

LITERATURE REVIEW

Title	Author	Year	Results	Limitations
PLANT DISEASE DETECTION USING DEEP LEARNING	SAIF KATPER	2020	The introduction highlights the crucial role of plants in the economy, climate change mitigation, and human survival. It emphasizes the global effort, including initiatives in Pakistan, to increase tree planting and address climate-related challenges. The economic and environmental importance of plants in food production and healthcare is also acknowledged. The paper discusses the impact of plant diseases on global food production and introduces the need for automated systems to detect and diagnose plant diseases efficiently.	1. Spreadable Nature of Diseases: The paper mentions that some plant diseases are of a spreadable nature, emphasizing the urgency of timely identification. However, it doesn't delve into specific challenges associated with controlling the spread of diseases or how the proposed system addresses this issue. 2. Reliance on Visual Symptoms: The identification of plant diseases is primarily based on visual symptoms observed by experts. The limitations of relying solely on visual inspection, such as subjectivity and potential misdiagnosis, are not thoroughly discussed.
PLANT DISEASE DETECTION USING MACHINE LEARNING.	RAMESH S.	2018	The paper addresses the significant threat of crop diseases to food security and the challenges in their rapid identification due to the lack of necessary infrastructure in many regions. It focuses on leaf based image classification using Random Forest as a method to distinguish between healthy and diseased leaves. The proposed approach involves phases such as dataset creation, feature extraction using Histogram of an Oriented Gradient (HOG), training the classifier, and classification. The study highlights the utilization of machine learning, specifically Random Forest, on publicly available large datasets for effective and scalable plant disease detection.	1. Infrastructure Dependency: The paper mentions the difficulty in rapid disease identification due to the absence of necessary infrastructure. However, it does not discuss potential limitations or challenges in implementing the proposed method in regions with limited technological resources or infrastructure. 2. Limited Feature Extraction Discussion: While the paper utilizes Histogram of an Oriented Gradient (HOG) for feature extraction, it lacks a detailed discussion on the choice of this technique and potential limitations associated with it. A more comprehensive analysis of feature extraction methods could enhance the paper's credibility.

RASHIK RAHMAN · UPDATED 3 YEARS AGO

112 | New Notebook | Download (1 GB)

Plant disease recognition dataset

Plant disease dataset

Data Card | Code (26) | Discussion (1) | Suggestions (0)

About Dataset

This dataset contains three labels, "Healthy", "Powdery", "Rust" referring to plant conditions. There is a total of 1530 images divided into train, test, and validation sets.

Usability ⓘ
7.50

License
CC0: Public Domain

```
* * * * * Number of files in each folder * * * * *

Train/Healthy: 458

Train/Powdery: 430

Train/Rust: 434

  Total: 1322
--------------------------------------------------------------------------------
```

97 PERCENT ACCURACY

https://www.kaggle.com/datasets/rashikrahmanpritom/plant-disease-recognition-dataset/data

In the realm of plant disease detection, efficient data collection is pivotal for the success of the project. Leveraging platforms like Kaggle facilitates access to diverse datasets, encompassing images of both healthy and diseased plants. These datasets serve as the foundation for training machine learning models to recognize patterns indicative of various plant diseases. The wealth of information available on Kaggle allows researchers and developers to create robust algorithms capable of accurately identifying and diagnosing plant ailments. By tapping into Kaggle's extensive collection, we ensure a comprehensive and diverse dataset, empowering our model to generalize well and deliver effective results in real-world scenarios. This collaborative and accessible approach to data collection enhances the overall efficacy of plant disease detection systems.

Screen shot from Plant-Disease-Detection-using-CNN.ipynb

Validating Performance

```
# Loading best weights
model.load_weights('best_model.h5')
```

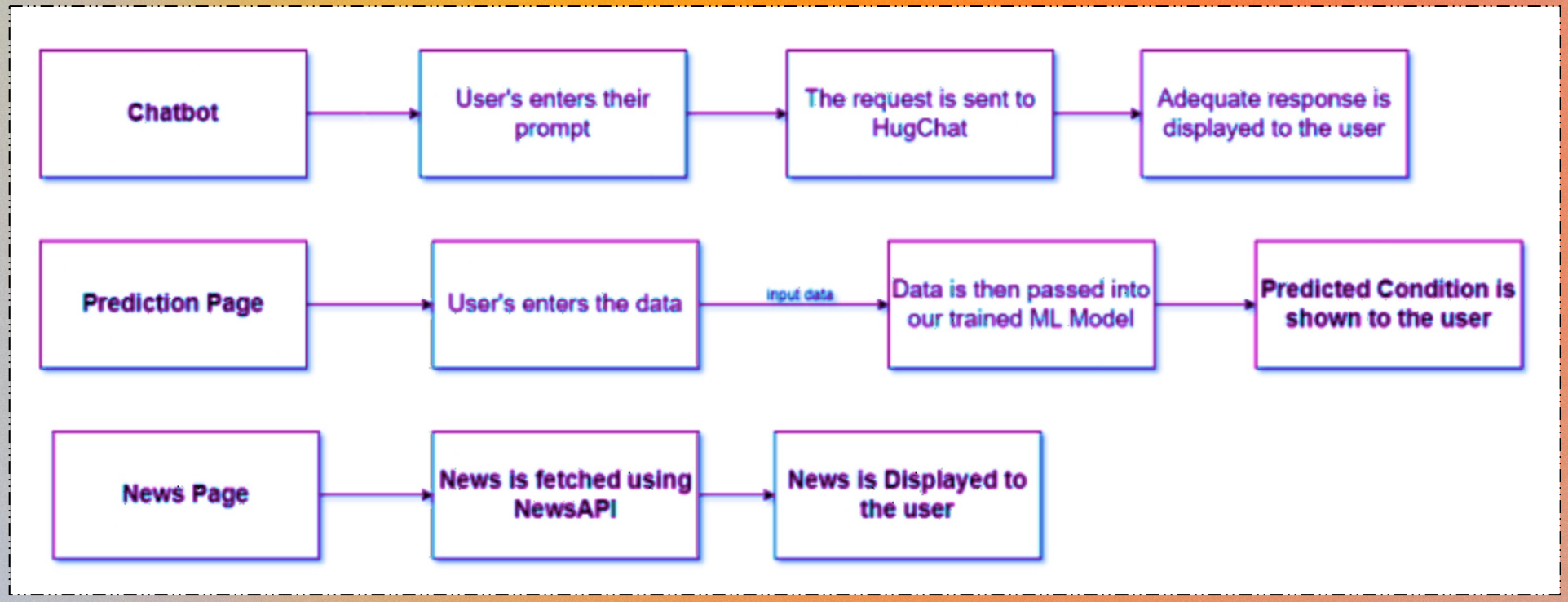
```
preds = model.predict(validation)  # Running model on the validation dataset
val_loss, val_acc = model.evaluate(validation) # Obtaining Loss and Accuracy on
the val dataset

print('\nValidation Loss: ', val_loss)
print('\nValidation Accuracy: ', np.round(val_acc * 100), '%')
```

```
4/4 [==============================] - 4s 230ms/step
4/4 [==============================] - 1s 215ms/step - loss: 0.2908 - accuracy: 0.9667

Validation Loss:  0.29083260893821716

Validation Accuracy:  97.0 %
```

OUR MODEL IS ACCURATE 97 PERCENT OF THE TIME

Jupiter notebook overview working of the CNN model

ARCHITURE FOR WEBAPP



HARDWARE REQUIREMENTS

1. COMPUTER: A MODERN MULTICORE PROCESSOR AND AT LEAST 16GB OF RAM ARE A GOOD STARTING POINT.
2. STORAGE: A FEW GIGABYTES OF STORAGE MIGHT BE NECESSARY, DEPENDING ON THE DATASET.
3. GPU (GRAPHICS PROCESSING UNIT): HAVING ACCESS TO ONE OR MORE GPUS CAN SIGNIFICANTLY SPEED UP MODEL TRAINING.
4. INTERNET CONNECTIVITY: WE'LL REQUIRE A RELIABLE INTERNET CONNECTION TO DOWNLOAD DATASETS, ACCESS RESEARCH PAPERS, AND COLLABORATE WITH OTHERS.

SOFTWARE REQUIREMENTS

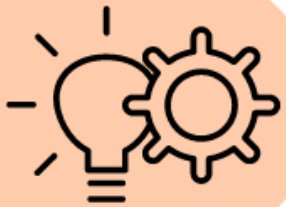
1. Python (>=3.6): The programming language used for development.
2. Streamlit (>=1.0): An open-source Python library for building web applications.
3. numpy (>=1.20.3): A fundamental package for scientific computing with Python.
4. pandas (>=1.3.3): A fast, powerful, flexible, and easy-to-use open-source data analysis and manipulation library built on top of Python.
5. textblob (>=0.15.3): A Python library for processing textual data.
6. toml (>=0.10.2): A library for parsing and manipulating TOML (Tom's Obvious, Minimal Language) configuration files.
7. html (>=1.16): A Python module for working with HTML code.
8. requests (>=2.26.0): A Python library for making HTTP requests.
9. streamlit-lottie (>=0.0.6): A Streamlit component for rendering Lottie animations.
10. streamlit-option-menu (>=1.0.3): A Streamlit component for creating option menus.
11. hugchat (>=0.2.0): A Python library for integrating Hugging Face's ChatGPT model into Streamlit apps.
12. tensorflow (>=2.7.0): An open-source machine learning framework for training and deploying deep learning models.
13. Pillow (>=8.4.0): A Python Imaging Library that adds image processing capabilities to Python interpreter.
14. googletrans (>=4.0.0): A Python library for Google Translate API.

TIMELINE

(March 15th - March 20th)

1. DATA COLLECTION

Gather diverse datasets containing plant images with associated disease labels, ensuring representativeness across different crops and regions.



(March 22nd - March 27th)

PREPROCESSING

Clean and preprocess the collected data, including resizing images, normalizing pixel values, and splitting into training and

PREPROCESSING

(March 30th - April 10th)

MODEL DEPLOYMENT

Deploy the trained plant disease detection model on a cloud-based platform or local server, ensuring scalability and accessibility for users.

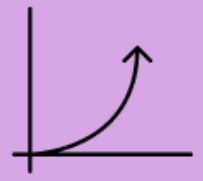
(April 12th - April 20th)

WEB APP DEVELOPMENT

Develop a user-friendly web application interface for uploading images, displaying results, and interacting with additional features like the chatbot and news integration.

(April 22nd - April 28th)

CHATBOT, REGIONAL LANGUAGES AND NEWS INTEGRATION



FORUM PAGE

(April 30th - May 5th)

FORUM PAGE

Create a forum page within the web app for users to discuss plant health issues, share insights, and seek advice from experts and fellow farmers.

(May 7th - May 8th)

WEB APP DEPLOYEMENT

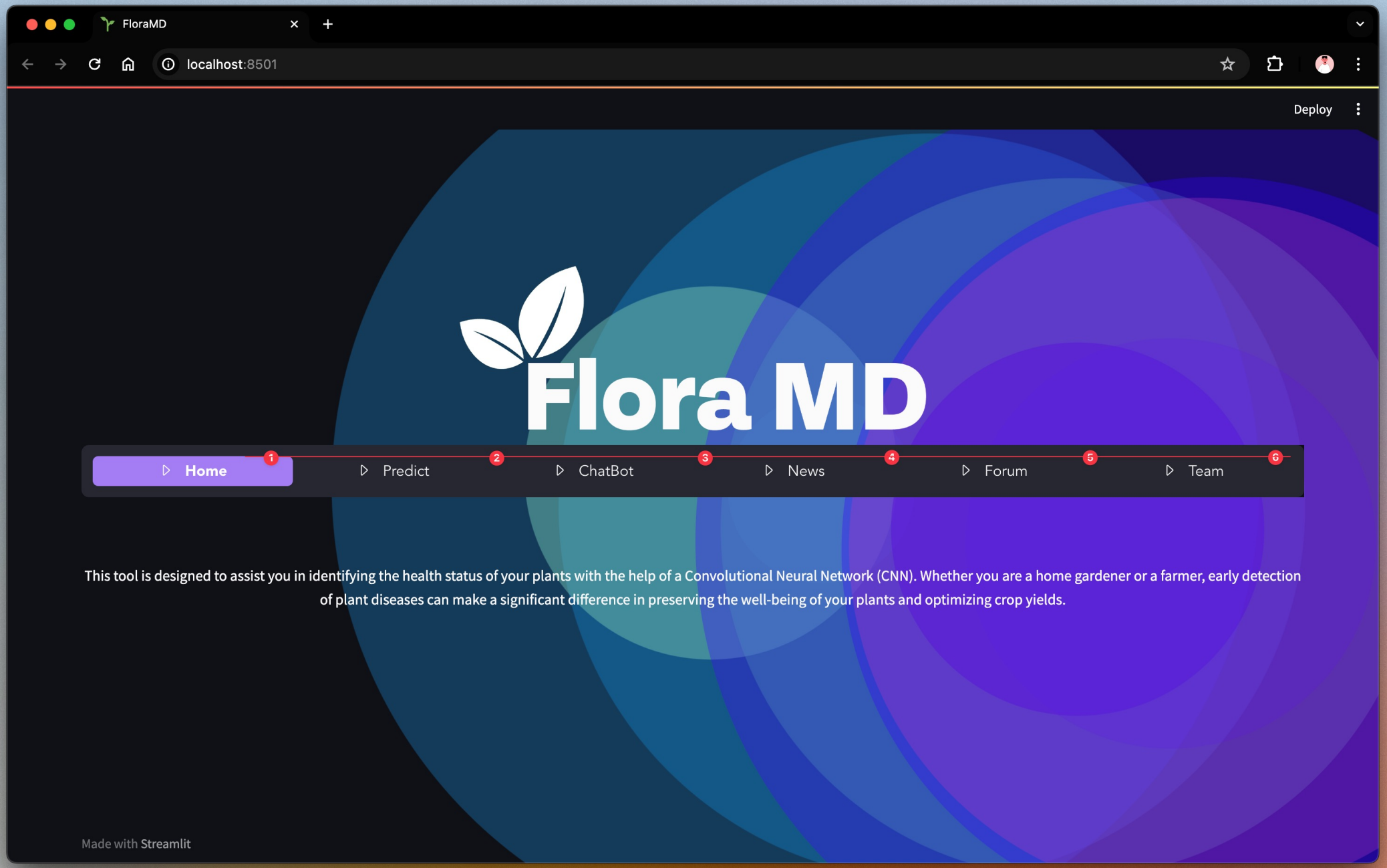
Deploy the completed web application on a secure server, ensuring reliability and availability for users to access from various devices and locations.

(May 8th)

API DEVELOPMENT

Develop an API to facilitate communication between different components of the system, allowing seamless integration with external services and future expansion.

THE WEBAPP


FloraMD
localhost:8501
Deploy
Flora MD
Home
Predict
ChatBot
News
Forum
Team
This tool is designed to assist you in identifying the health status of your plants with the help of a Convolutional Neural Network (CNN). Whether you are a home gardener or a farmer, early detection of plant diseases can make a significant difference in preserving the well-being of your plants and optimizing crop yields.
Made with Streamlit

Flora M

Home 1 | Predict 2 | ChatBot 3 | News

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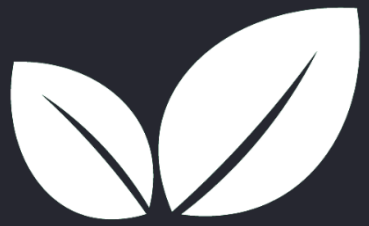
Deploy

Home | Predict | ChatBot | News | Forum | Team



Choose a language

English

- English
- Hindi
- Bengali
- Telugu
- Marathi
- Tamil
- Urdu
- Gujarati

disease in a plant using
Convolutional Neural Network (CNN).

Contact

For inquiries, you can mail us here.

Predict

Plant Disease Detection using CNN

Welcome to the "Plant Disease Detection using CNN" Streamlit web application. This tool is designed to assist you in identifying the health status of your plants with the help of a Convolutional Neural Network (CNN). Whether you are a home gardener or a farmer, early detection of plant diseases can make a significant difference in preserving the well-being of your plants and optimizing crop yields.

How It Works

1. **Upload an Image:** To get started, simply upload an image of your plant. The image should be clear and centered on the plant.
2. **Prediction:** Once you've uploaded an image, click the "Predict" button. Our pre-trained CNN model will analyze the image to determine whether the plant is "Healthy," affected by "Powdery Mildew," or has signs of "Rust."
3. **Confidence Score:** The application will provide you with a confidence score, indicating how sure the model is about its prediction.

Why Use This App?

- **Early Disease Detection:** Detecting plant diseases early can help prevent the spread of diseases and reduce crop losses.
- **Easy to Use:** You don't need to be an expert in plant pathology. This user-friendly tool simplifies the process of disease detection.
- **Quick Results:** In just a few seconds, you'll receive a classification result with a confidence score.

Prediction: Rust

Confidence: 1.0

Disease : Puccinia Conventional Method Solution for Rust in Plants:

1. Fungicides: If rust is creeping into your crops, chemical fungicides can come to the rescue. These specially formulated solutions are like superhero shields against rust pathogens. Apply them as directed o during the growing season.
2. Crop Rotation: Give rust the old switcheroo! By rotating your crops, you break the disease's chain, stopping it in its tracks. Mix up what you plant in the affected area each season to throw off those pesky r
3. Sanitation: A clean field is a happy field! Keep your planting area tidy by clearing out any infected plant debris or weeds. Dispose of these nasties properly to prevent rust from hitching a ride to healthy pla
4. Resistant Varieties: Give rust a run for its money by planting varieties that are tough as nails. Look for plants that have been bred to resist rust diseases. They'll stand strong against rust, reducing the need yields.

Natural Method Solution for Rust in Plants:

1. Neem Oil: Time to call in nature's cavalry! Neem oil is a natural warrior against rust fungi. Mix it up according to the instructions and spray it on your plants to send rust packing.
2. Baking Soda Solution: Raid your kitchen for this natural remedy! Mix baking soda with water to create a solution that rust fungi can't stand. Give your plants a good spray to create an inhospitable environ
3. Milk: Got milk? You're in luck! This kitchen staple doubles as a natural fungicide. Mix it with water and spray it on your plants to keep rust at bay. Repeat every week or so for maximum effect.

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PNG, JPG, JPEG

st-disease (3)...

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an mail us here.

VIT®
HOPAL
www.vitbhopal.ac.in

Prediction: Rust

Confidence: 1.0

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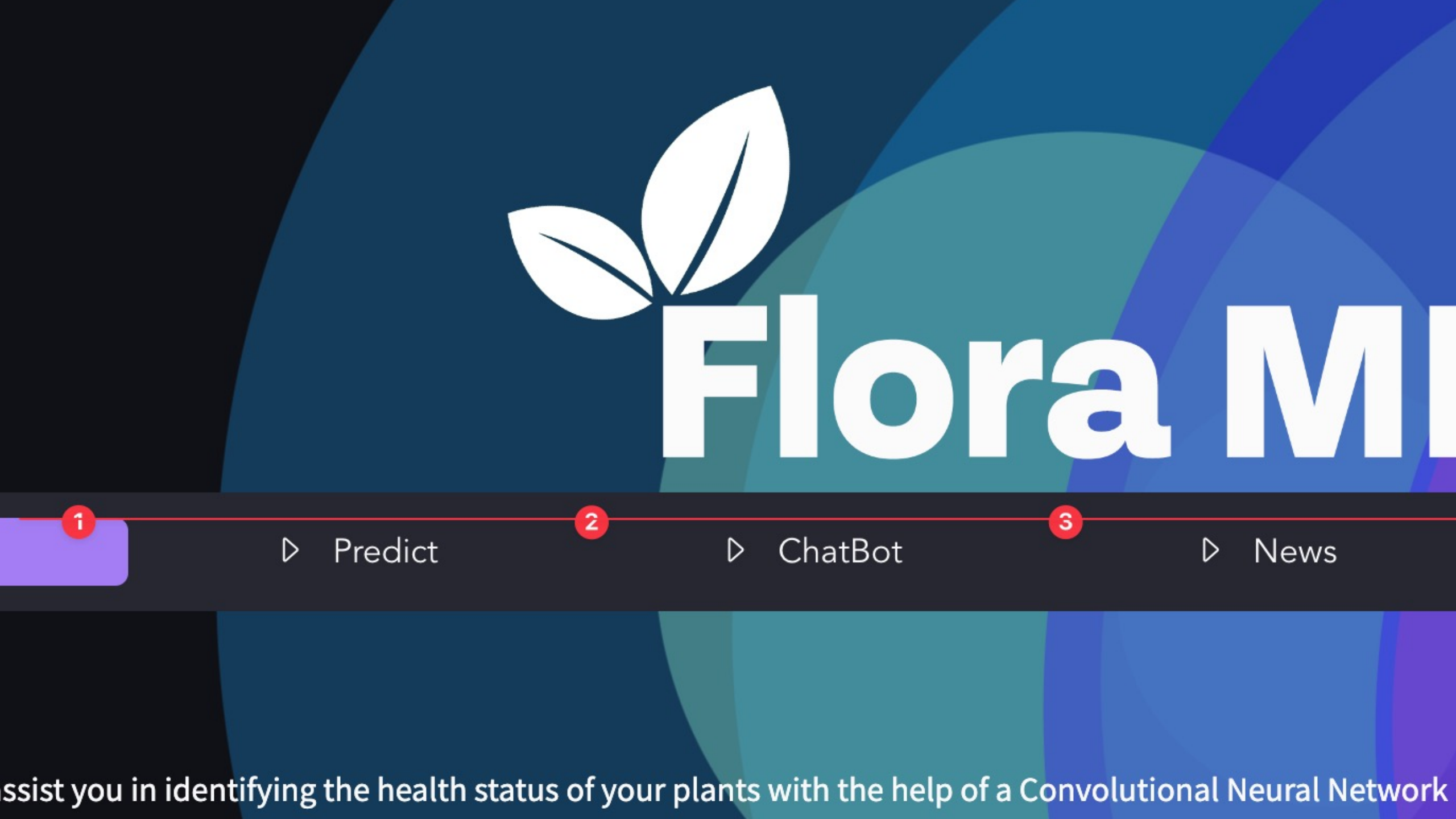
4. Copper-Based Fungicides: Mother Nature's copper shield! These organic-approved fungicides disrupt rust fungi, keeping them from spreading. Follow the instructions on the label to apply them safely and
5. Companion Planting: Rust won't stand a chance against this tag team! Plant garlic, onions, or marigolds alongside your susceptible crops to repel rust fungi. It's like having a natural bodyguard for your pla

- Conventional Fungicides:
  - Neem Oil from IFFCO Bazar
  - Copper Based Fungicides from IFFCO Bazar
  - Ziram fungicide
  - Captan fungicide
  - Tebuconazole fungicide
- Natural Fungicides:
  - Neem Oil from IFFCO Bazar
  - Baking soda


Flora MI
1
Predict
2
ChatBot
3
News
ssist you in identifying the health status of your plants with the help of a Convolutional Neural Network

Hi! How may I help you?

my plant has mildew what should i do

Mildew is a common fungal disease that affects many types of plants, causing a white, powdery coating on leaves and stems. Here are some conventional treatments to get rid of mildew:

1. Fungicidal Sprays: Conventional fungicides, such as sulfur, neem oil, or potassium bicarbonate, can be sprayed on affected plants to kill the mildew and prevent its spread. Be sure to follow the instructions on the product label and wear protective gear when handling fungicides.
2. Remove Infected Plant Parts: Prune and discard heavily infected leaves and stems to reduce the spread of the disease. Sterilize your pruning tools between cuts to avoid transmitting the fungus to healthy parts of the plant.
3. Improve Air Circulation: Mildew thrives in humid environments with poor air circulation. Prune nearby plants to increase airflow and reduce humidity around the affected plant.
4. Avoid Overhead Watering: Water the base of the plant rather than the leaves to prevent creating humid conditions that favor mildew growth. Water early in the day so that any moisture on the leaves has time to dry before evening.

Here are some natural and organic alternatives to consider:

1. Baking Soda Spray: Mix one teaspoon of baking soda, one teaspoon of horticultural oil or mild liquid soap, and one gallon of water. Spray this solution on the leaves and stems to create an alkaline environment that is unfavorable for mildew growth.

Your message

Flora MD

ChatBot 3 News 4 Forum 5

ur plants with the help of a Convolutional Neural Network (CNN). Whether you are a home gardener or a
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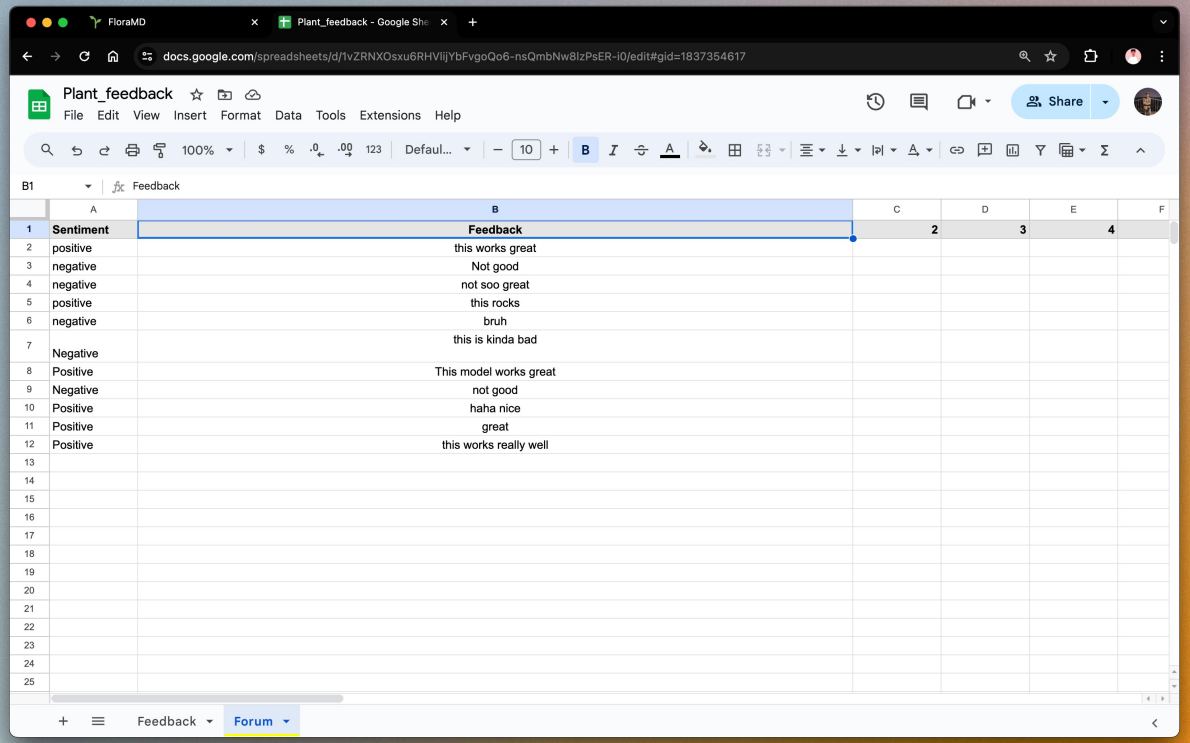
Plant Disease Classifier with Azure AI Custom Vision and Blazor

This concise article explores the innovative integration of Azure AI Custom Vision service with a Blazor web application to create a sophisticated Plant Diseases Classifier model. The article highlights the seamless fusion of cutting-edge AI technology with m…

Link : https://www.c-sharpcorner.com/article/plant-disease-classifier-with-azure-ai-cus...

Author : Cristopher Coronado, *2024-04-17*



	A	B	C	D	E	F
1	**Sentiment**	**Feedback**	**2**	**3**	**4**	
2	positive	this works great				
3	negative	Not good				
4	negative	not soo great				
5	positive	this rocks				
6	negative	bruh				
7	Negative	this is kinda bad				
8	Positive	This model works great				
9	Negative	not good				
10	Positive	haha nice				
11	Positive	great				
12	Positive	this works really well				
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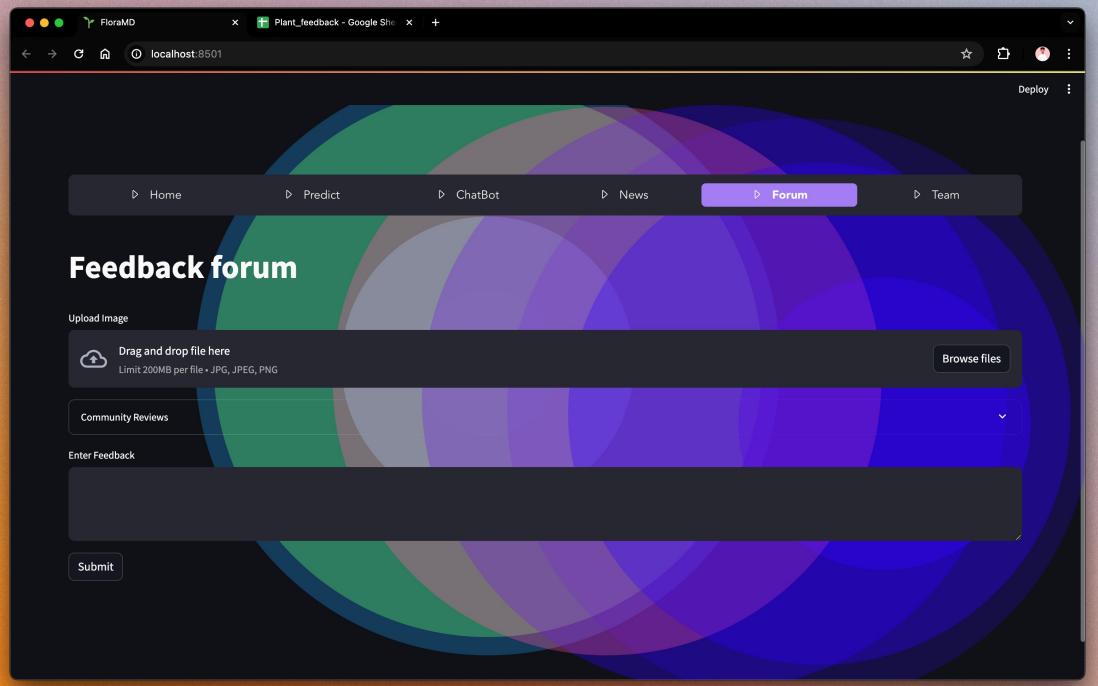

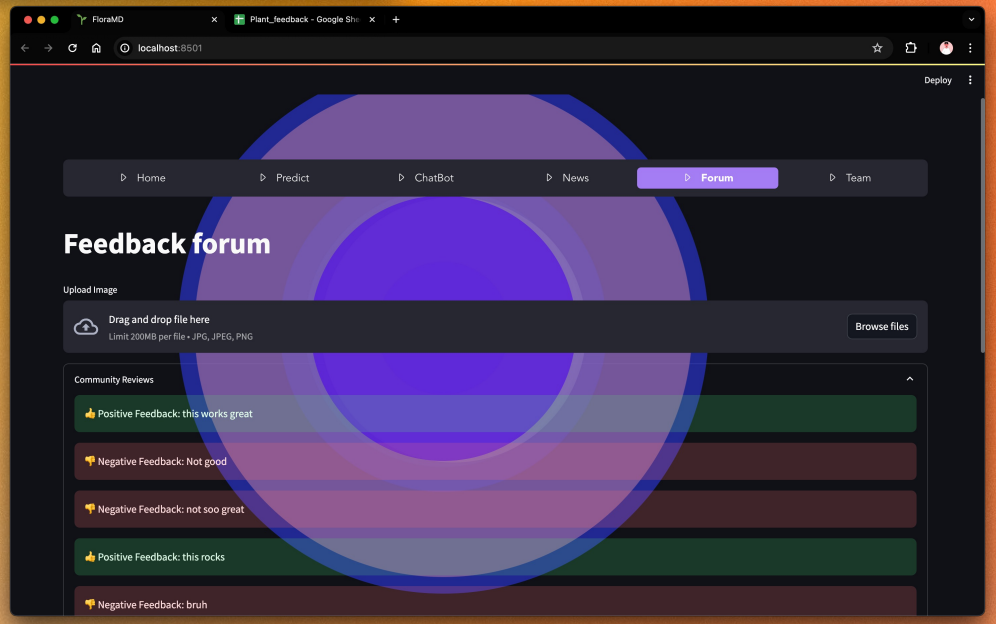

Meet our dedicated team members

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Ravneet Kaur 22BAI10246

MODEL TESTING

Vansh Dudeja 22BAI10257

DATA TRAINING AND TESTING

Mitali Rawat 22BAI10429

FEATURE EXTRACTION

Yamini Masand 22BAI10426

DATA PREPROCESSING

CODE PREVIEW

GITHUB REPO :	https://github.com/siddharth-mohril/Flora-MD
DEPLOYED WEBAPP:	https://plant-disease-detection-pkue.onrender.com
OUR API LINK:	https://arpy8-plant-detection-api.hf.space/docs


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THANKYOU