



ECOSCAN

Plant Disease Detection System

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& Retrospective

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Used

05.

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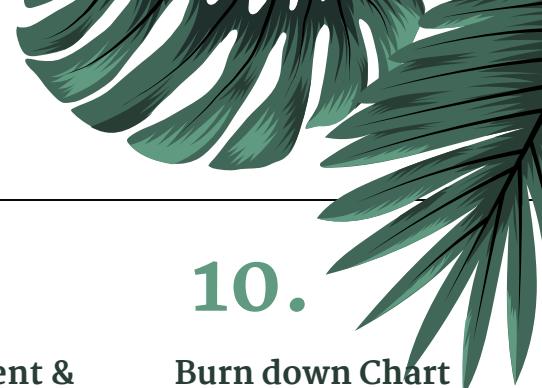
User Stories &
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09.

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Our Team



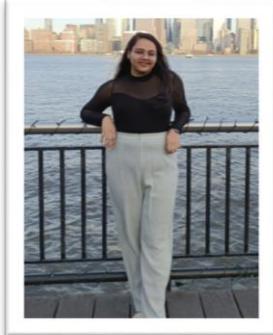
Rudra Chobe
Scrum Master



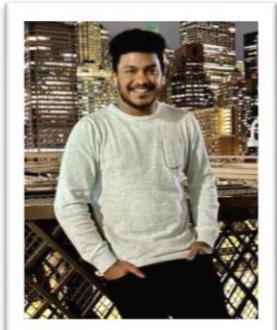
Omkar Gurav
Developer



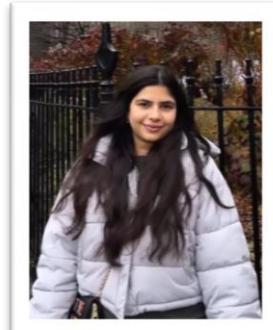
Shriya Haral
Developer



Ritika Chougala
Developer



Lokeshwar Anchuri
Developer



Niyati Ghagada
Developer



Uma Maheswari Addala
Developer / Tester



Mukesh Suddala
Developer/Quality Assurance

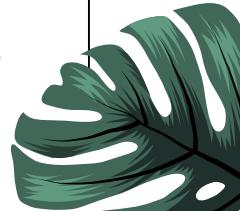


IMPROVEMENTS MADE FROM PROFESSOR'S FEEDBACK

- Added acceptance criteria and user stories in the same slides
- Added Project Description as per the template
- Made changes to test cases
- Added Team velocity chart
- Included demo in the Presentation



This indicates the changes made





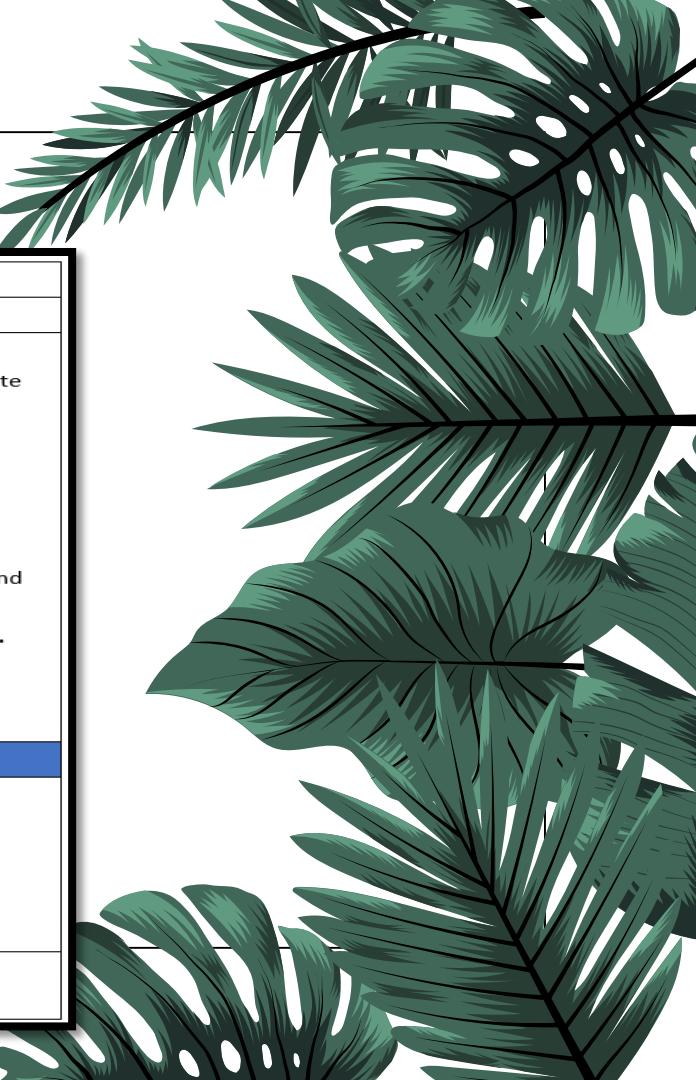
PROBLEM WHICH WE ARE ADDRESSING





Project Description

Project Name:	Eco Scan
Team:	Algo-Avengers
Project Description:	<p>"Eco Scan" is a pioneering project leveraging Convolutional Neural Networks (CNN) and image processing techniques for rapid and accurate plant disease detection.</p> <p>For farmers</p> <p>Who uploads an images</p> <p>the Eco Scan</p> <p>is a deep neural Network model application</p> <p>that provides rapid and accurate plant disease detection in real time and free of cost</p> <p>rather than subscribing to highly paid applications with less accuracies.</p> <p>Our application will help the user with CNN algorithms to analyze and identify potential diseases swiftly.</p>
Project Description	
Benefit Outcomes:	Aims to: optimize crop health monitoring, minimize losses promote sustainable farming practices.
GitHub Link:	https://github.com/htmw/2024S-AlgoAvengers.git



Problem Statement

Furthermore, the economic impact of plant diseases on farmers and the agriculture industry is substantial, with losses stemming from reduced yields, increased use of pesticides, and the potential spread of diseases to neighboring crops. In the race of climate change and global trade, the dynamics of plant diseases are evolving, necessitating a more adaptive and technology-driven approach to diagnosis and management. The development of efficient and scalable plant disease detection solutions that leverage advancements in artificial intelligence, machine learning, and image processing is paramount. By addressing these challenges, **we can empower farmers with timely information, minimize crop losses, promote sustainable farming practices, and contribute to the overall resilience of the agricultural sector in the face of emerging plant health threats**

Problem Statement

The agriculture sector plays a crucial role in sustaining global food security, and plant diseases pose a significant threat to crop yield and quality. Identifying and managing these diseases in a timely and accurate manner is essential for ensuring food production. However, the current methods of plant disease detection often rely on visual inspection by experts, leading to delays in diagnosis and sometimes inaccurate assessments. Additionally, the increasing complexity and variability of plant diseases make it challenging for traditional methods to keep pace with emerging threats. There is a pressing need for advanced and automated plant disease detection systems that can provide rapid, reliable, and precise identification of diseases, enabling farmers to take proactive measures to protect their crops and enhance overall agricultural productivity.



TEAM AGREEMENT

Team Agreement

Participation and Work Division

- All the team members are expected to attend the meeting promptly and involve in discussions. Absence of team member will affect teams' performance and efficiency.
- If team member is not able to attend the meeting, he/she should let the team know earlier.
- The entire project should be divided into equal parts and equal responsibilities should be given to all team members.
- Each team member should complete their respective work before the deadline. If they are unable to complete the work on time, that hinders the performance of entire team. If in case any team member is facing issue at any point, they can share it with other team members so they can help each other and get the work completed before deadline.

Communication

- The team will communicate through WhatsApp Group and for weekly meetings Teams will be used.
- Jira software will be used to track the assigned tasks.
- Task management, bugs, sprint planning and meetings minutes will be tracked in Jira.
- Google docs will be used to share the final deliverable where all team members will be able to edit the document.

Meetings

- All team members will meet virtually on Teams everyday. All the team members must be present, as attendance is mandatory unless there is an emergency.
- The team member is responsible for sending meeting details and conducting the meeting.
- A meeting track or meeting minutes reports would be listed after every meeting to keep track of the project and its progress.
- Every team member is expected to come up with ideas, participate in the discussions and give update on their progress for their part of the work.

Team Members	Email Id's
Rudra Chobe	rc81960n@pace.edu
Omkar Gurav	og52887n@pace.edu
Shriya Haral	sh94716n@pace.edu
Ritika Chougala	rc93170n@pace.edu
Lokeshwar Anchuri	la58264n@pace.edu
Niyati Ghagada	ng59819n@pace.edu
Uma Maheswari Aishwarya Addala	ua26809n@pace.edu
Mukesh Suddala	ms67865n@pace.edu



PERSONAS



PERSONAS

Ava, the progressive farmer is deep-rooted in the rhythm of the seasons, guiding her farm through cycles of growth and harvest. Yet, she's no stranger to the harsh realities of plant disease and its impact on yield and sustainability. Faced with the complexities of organic farming, she's seeking innovative solutions to protect her crops without resorting to chemical interventions.

Interests

- Aside from her passion for sustainable farming, Ava is interested in the latest agricultural technologies that can help optimize organic farming practices.

Frustration

- The unpredictability of plant diseases and the limited effectiveness of conventional organic methods in rapid detection and management are her main obstacles.

Goals

- Ava is determined to integrate cutting-edge technology into her farming practices to boost productivity while adhering to organic principles.



Name: Ava

Age: 28

Location: Ames, Iowa

Occupation: Owner and operator of an organic farm

Income: \$66,000/annually

Family: Married

PERSONAS

Raj is a visionary in his field, constantly coding and testing the limits of artificial intelligence to serve the earth's farmers. He sees the potential in every line of code to revolutionize traditional farming practices. However, he struggles to find real-world test beds for his algorithms, which are necessary to refine and tailor his solutions to the nuanced needs of agriculture.

Interests

- Participating in Hackathons, Coding contests etc.
- Practicing yoga and mindfulness
- Emerging tech in AI.

Frustration

- Access to diverse agricultural data and the hesitancy of the farming community to adopt new technologies are his primary challenges.

Goals

- To develop a robust platform that can adapt to various agricultural contexts and improve farm resilience against diseases.



Name: Raj

Age: 30

Location: New York City, NY

Occupation: AI Software Engineer in Agri-Tech

Income: \$120,000/annually

Family: Single

PERSONAS

Claire is a bridge between the agrarian world and the halls of legislation, tirelessly working to shape policies that promote ecological stewardship and technological innovation in farming. She understands the urgency of sustainable agriculture in the face of climate change but is often met with resistance from policymakers reluctant to prioritize or fund these initiatives.

Interests

- Enjoys reading about global economic trends.
- Organizes educational workshops on sustainability.
- Enjoying weekend family outings

Frustration

- Her challenge is to navigate the complex political and economic landscapes to secure support and funding for agricultural technology initiatives

Goals

- To influence the adoption of sustainable agriculture policies that support and encourage the use of advanced technologies like "Eco Scan."



Name: Claire

Age: 52

Location: Brussels, Belgium

Occupation: Environment Policy Advisor

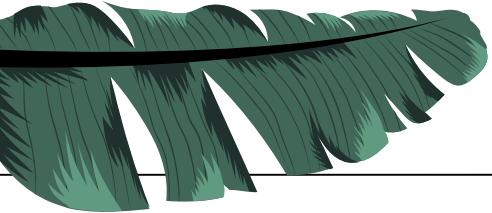
Income: \$70,000/annually

Family: Married

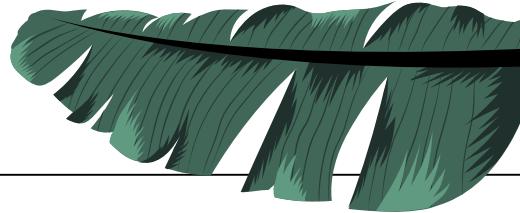


MINIMAL VIABLE PRODUCT





MVP



DISEASE DETECTION PAGE

- A user-friendly interface allowing users to upload images of plant leaves for disease detection, promoting ease of use and accessibility.
- Presentation of detected disease name, stage, description, precautions, and recommended supplements based on the uploaded image.
- An informative section explaining the importance of detecting diseases in plants. This could include preventing crop loss, maintaining agricultural productivity, and ensuring overall plant health.
- Clear and concise steps outlined to prevent plant diseases. This may include practices such as regular inspection, timely treatment, and maintaining optimal growing conditions.
- Know Why is it necessary to detect disease in plant ?
- Check Prevent Plant Disease steps.



[HOME](#) / [PLANT DISEASE DETECTION](#)

Plant Disease Detection

Why is it necessary to detect disease in plant ?

Plant diseases affect the growth of their respective species. In addition, some research gaps are identified from which to obtain greater transparency for detecting diseases in plants; even before their symptoms appear clearly, diagnosis is one of the most important aspects of a plant pathologist's training. Without proper identification of the disease and the disease-causing agent, disease control measures can be a waste of time and money and can lead to further plant losses. Proper disease diagnosis is necessary.

Choose File 1.JPG

Simply upload your plant's leaf image and then see the magic of AI.

Submit

Prevent Plant Disease follow below steps:

1. Follow Good Sanitation Practices.
2. Fertilize to Keep Your Plants Healthy.
3. Inspect Plants for Diseases Before You Bring Them Home.
4. Allow the Soil to Warm Before Planting.
5. Ensure a Healthy Vegetable Garden By Rotating Crops.
6. Provide Good Air Circulation
7. Remove Diseased Stems and Foliage

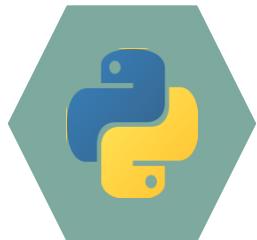
[More info](#)



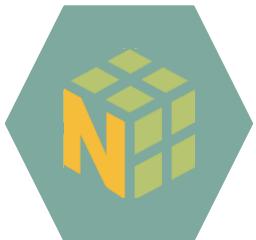
TOOLS AND WHERE THEY ARE USED



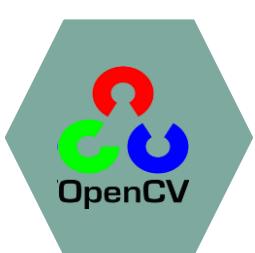
TOOLS AND LANGUAGES



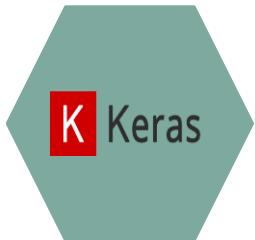
Python



Numpy



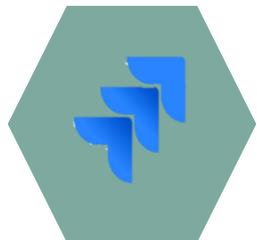
OpenCV



Keras



CSS



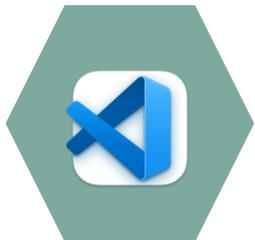
JIRA



TensorFlow



HTML



Visual
Studio



GIT

WHERE ARE THEY USED?



Front End

HTML, CSS: Used for building our website
Visual Studio: For Front end coding

Figma: Used for Designing (Design Interface)



Back End

Keras, Numpy , Tensorflow:
ML Libraries used for model building

Python: Used for programming ML Models

Open CV: For object detection

Django : To connect with Front end



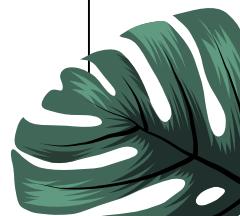
Management

JIRA : Planning and workflow

Teams : Daily meetings

WhatsApp : Daily communications

Git : For Source code management

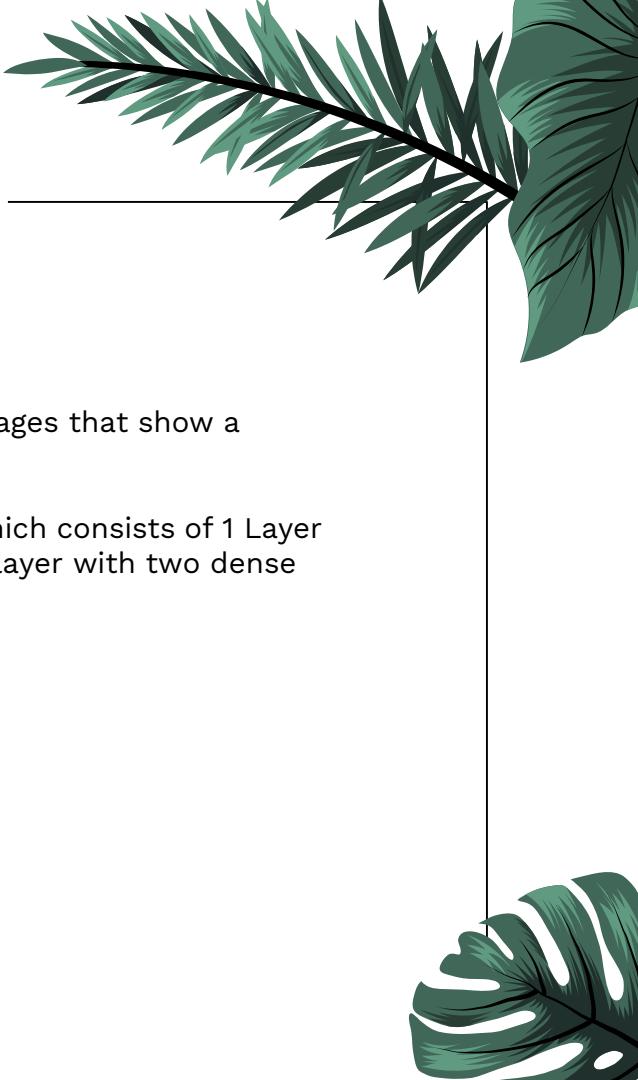


Machine Learning Algorithm



MACHINE LEARNING ALGORITHM

- **Database:** Plant Village which contains **84K RBG images**
 - **Training Data:** 70 %
 - **Testing Data:** 30%
 - **Plant types:** 14
 - **No. of Classes:** 38 (while excluding healthy leaves, 26 types of images that show a particular disease in a particular plant).
- **Model:** **Vision Transformer model**, it is good for image classification which consists of 1 Layer of ViT(Vision transformer) with one flatten layer, 2 batch normalization layer with two dense layer. Total 6 layers.
- **Metrics:** Accuracy and losses
- For backend we are using Django framework to connect with front end.



Dataset

GT -> Cassava__mosaic_disease



GT -> Corn__common_rust



GT -> Cassava__bacterial_blight



GT -> Squash__powdery_mildew



GT -> Squash__powdery_mildew



GT -> Soybean__healthy



GT -> Squash__powdery_mildew



GT -> Soybean__healthy



GT -> Cassava__mosaic_disease



GT -> Squash__powdery_mildew



GT -> Tomato__bacterial_spot



GT -> Cassava__green_mottle



GT -> Cassava__healthy



GT -> Apple__healthy



GT -> Tomato__leaf_curl



GT -> Soybean__healthy



GT -> Potato__early_blight



GT -> Cassava__mosaic_disease



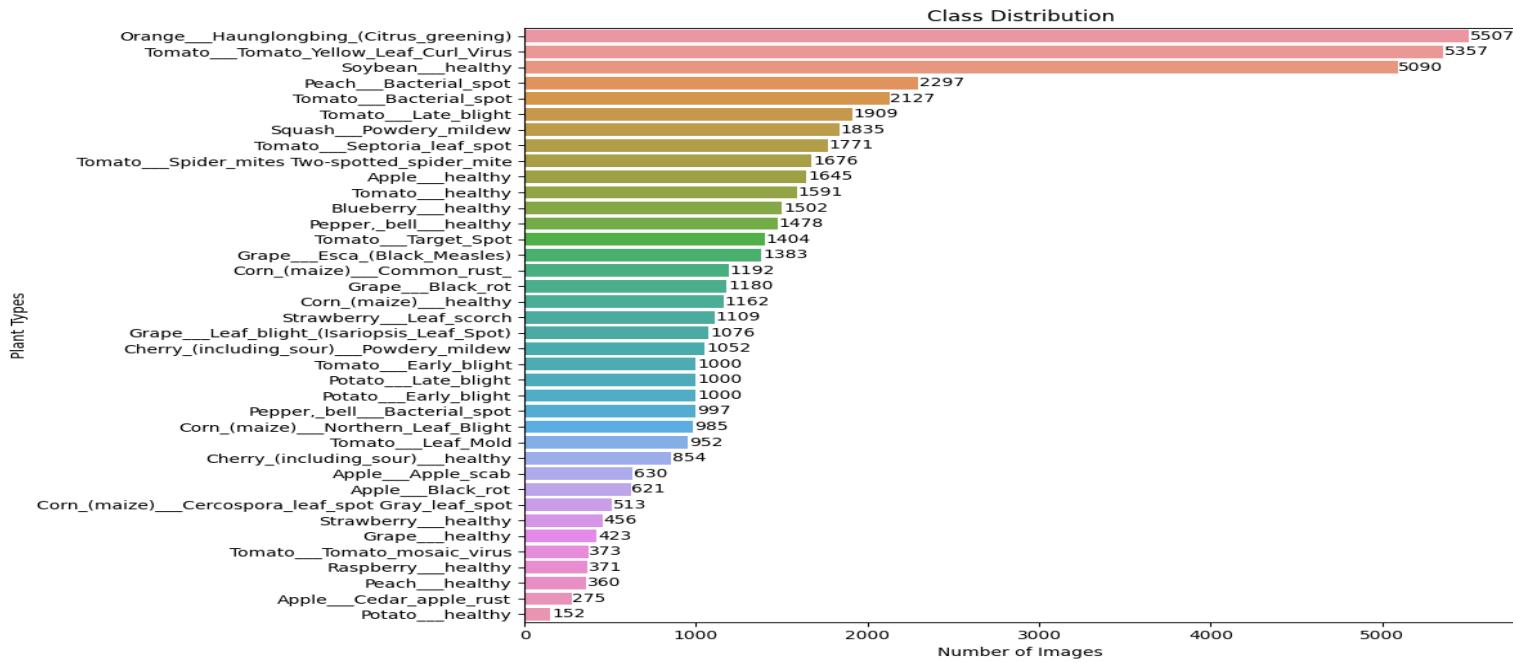
GT -> Tomato__leaf_curl



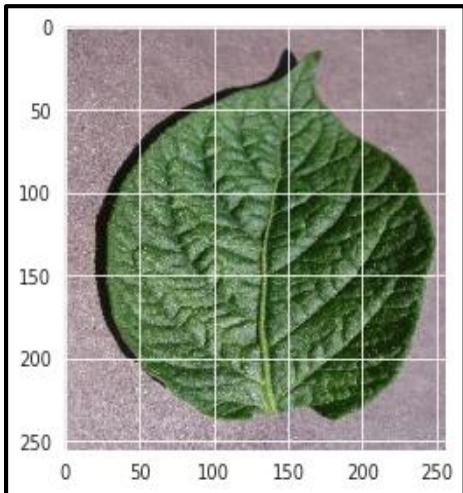
GT -> Tomato__leaf_curl



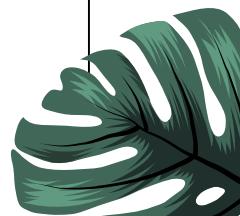
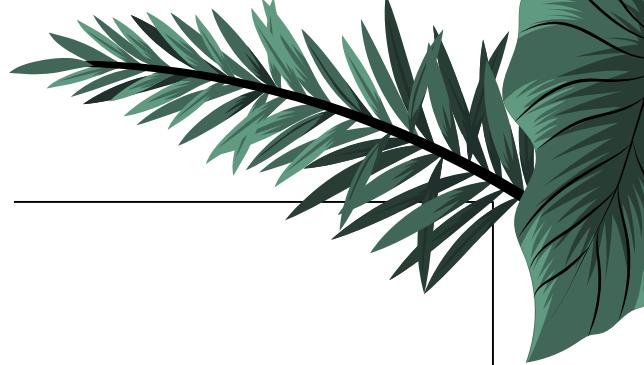
Data Class distribution:



Data Augmentation:



- **Training dataset:** 70% of the images from over 50,000 expertly curated images on healthy and infected leaves of crop plants, available on the PlantVillage platform.
- **Testing dataset:** 30% of the images, also sourced from the PlantVillage platform.
- **Standardization:** Resizing all images to 100x100 pixels to ensure uniformity across the dataset.
- **Transformation:** Gray scaling all images to simplify the data and remove color variation, aiding in the efficiency of machine learning algorithms.



Model Architecture :

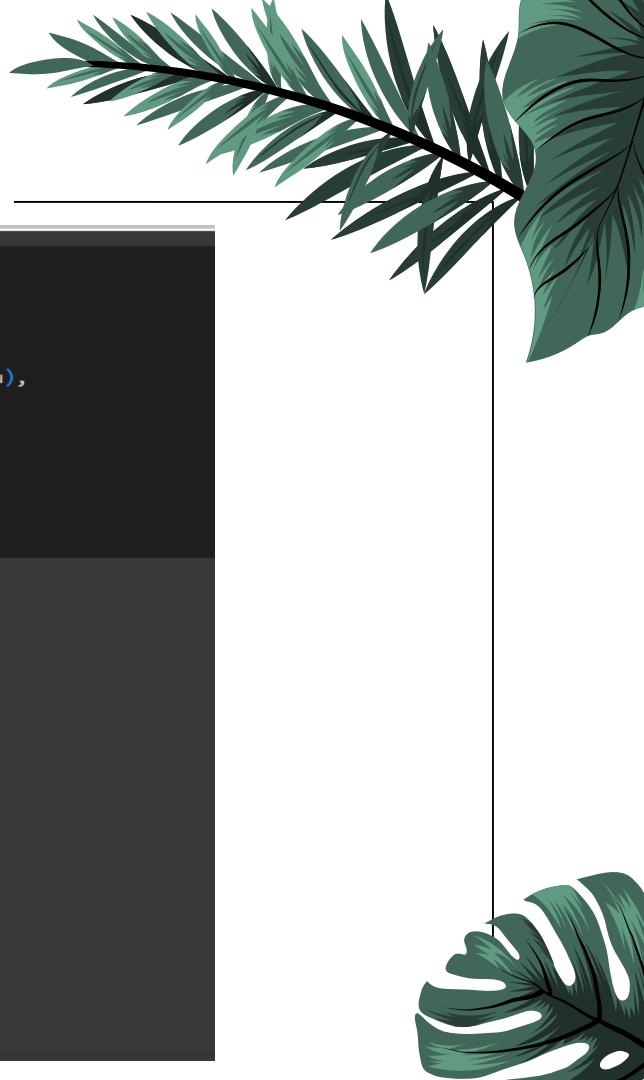
```
▶ model = tf.keras.Sequential([
    vit_model,
    tf.keras.layers.Flatten(),
    tf.keras.layers.BatchNormalization(),
    tf.keras.layers.Dense(50, activation = tfa.activations.gelu),
    tf.keras.layers.BatchNormalization(),
    tf.keras.layers.Dense(38, 'softmax')
],
name = 'vision_transformer')

model.summary()
```

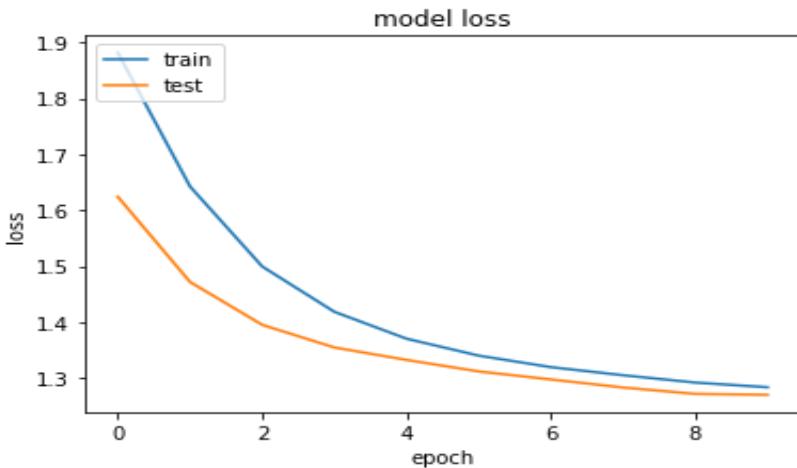
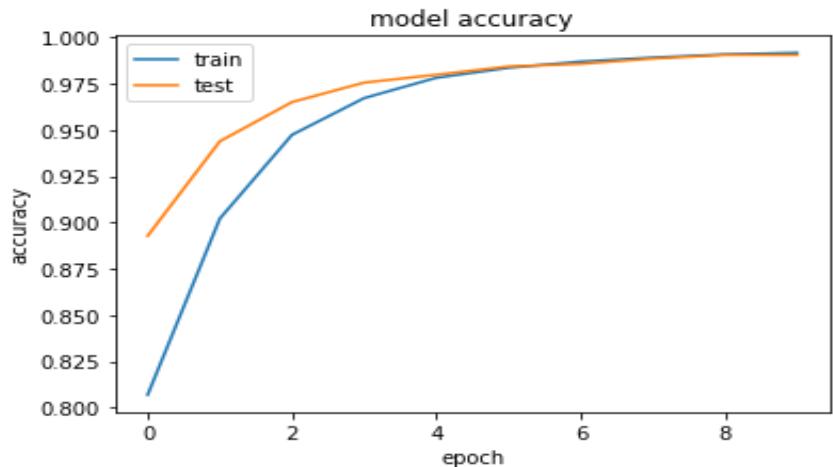
Model: "vision_transformer"

Layer (type)	Output Shape	Param #
vit-b32 (Functional)	(None, 768)	87455232
flatten (Flatten)	(None, 768)	0
batch_normalization (BatchNo	(None, 768)	3072
dense (Dense)	(None, 50)	38450
batch_normalization_1 (Batch	(None, 50)	200
dense_1 (Dense)	(None, 38)	1938

Total params: 87,498,892
Trainable params: 87,497,256
Non-trainable params: 1,636



Model Accuracy and losses graph :

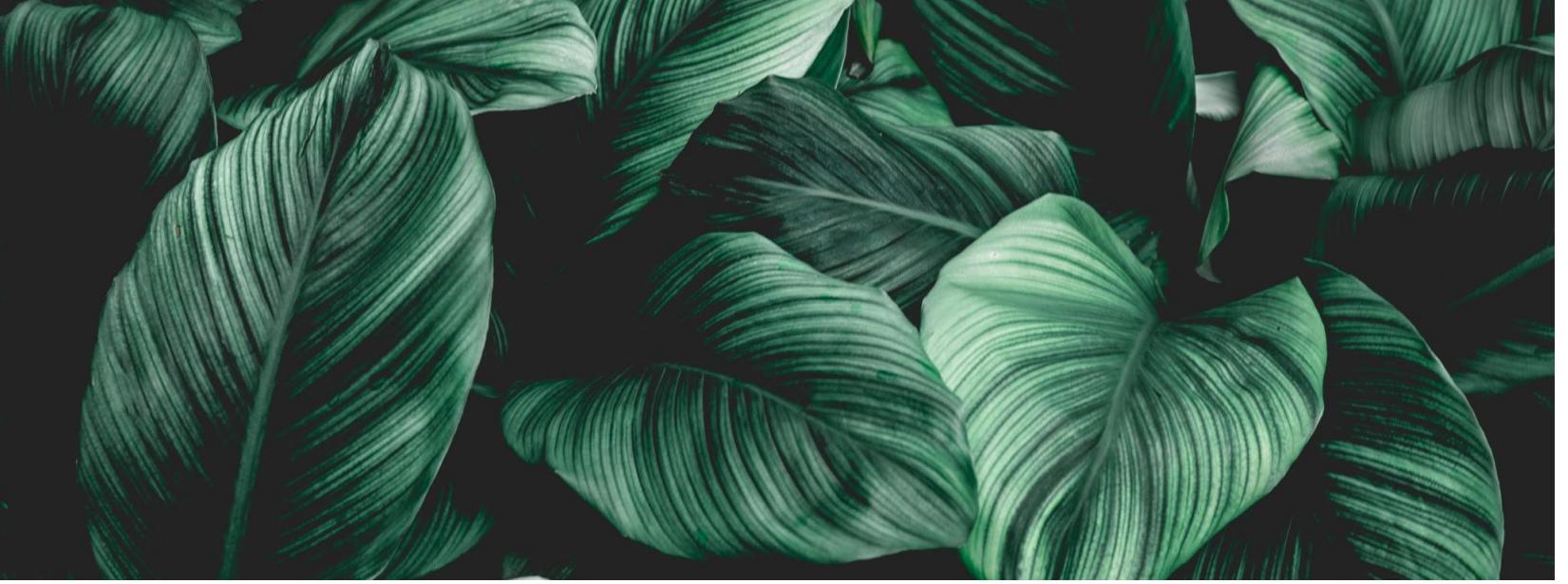


Training accuracy: 98.2%

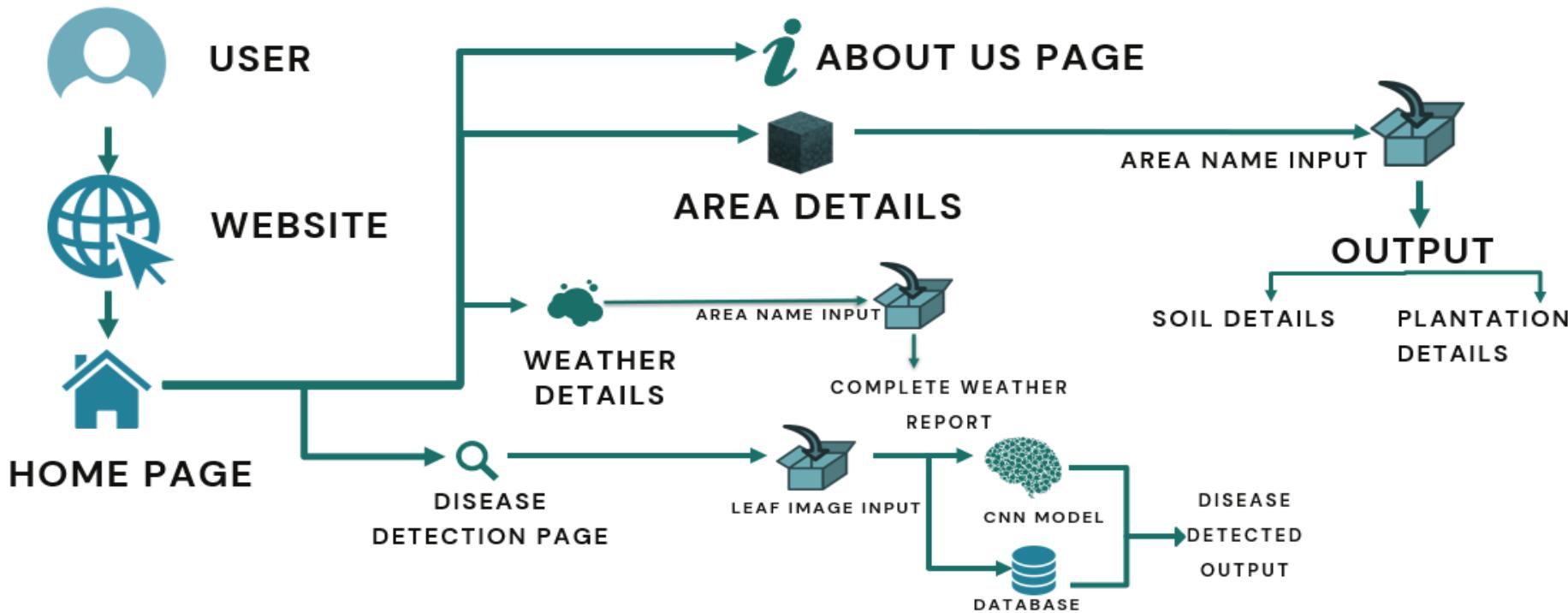
Validation Accuracy: 96.8%



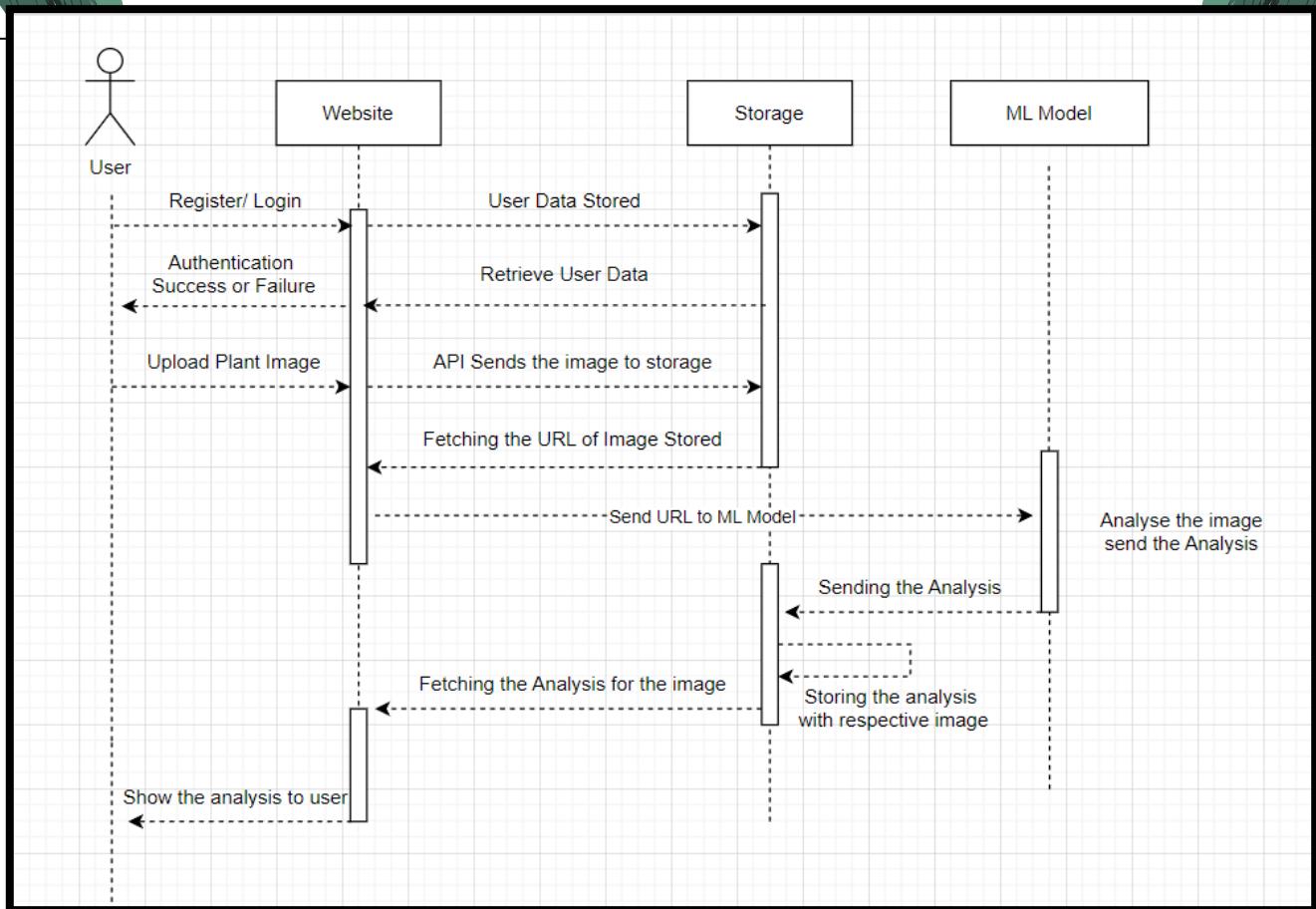
Diagrams



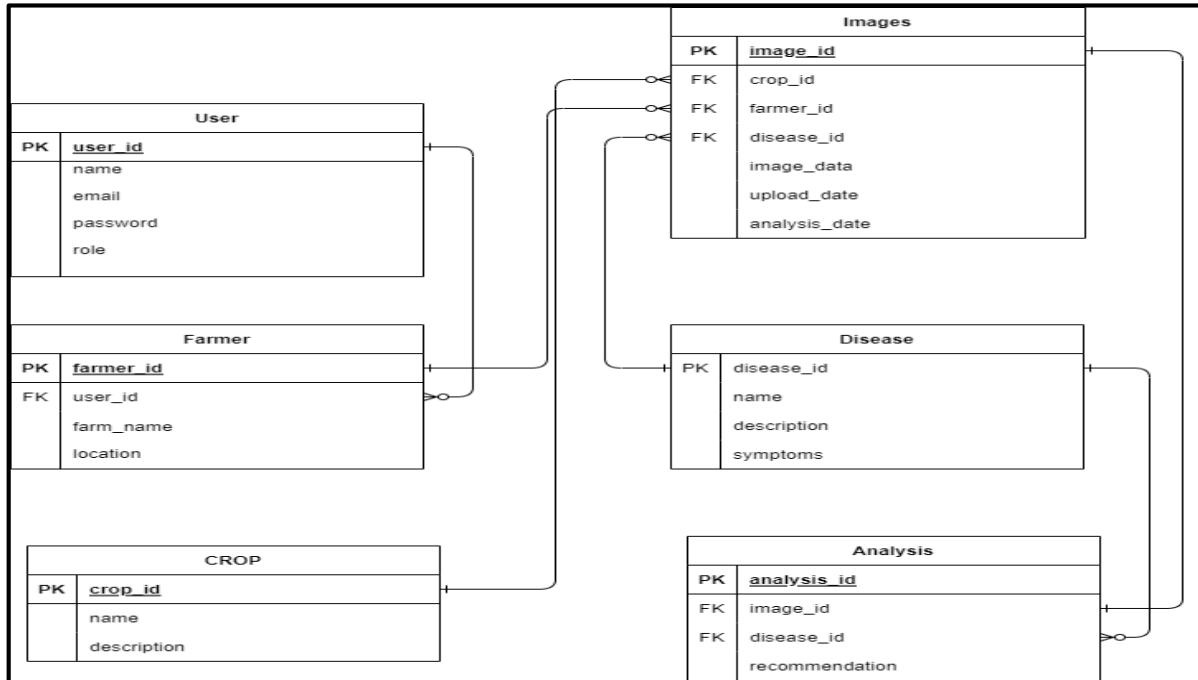
CONCEPTUAL DIAGRAM



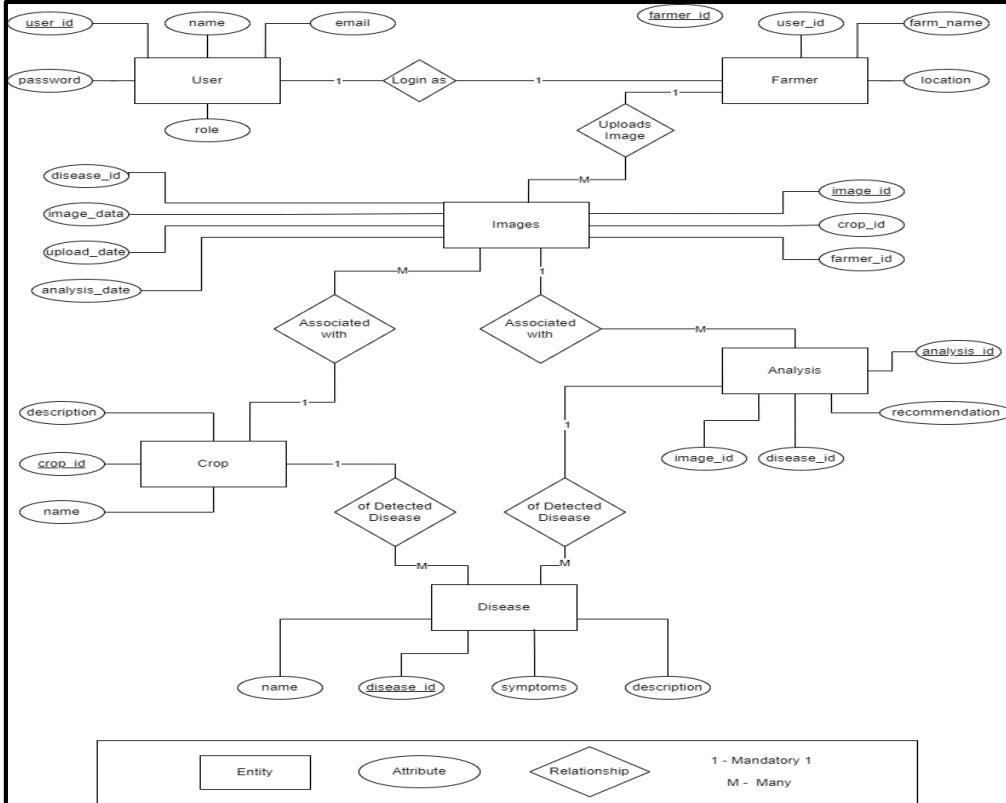
SEQUENCE DIAGRAM



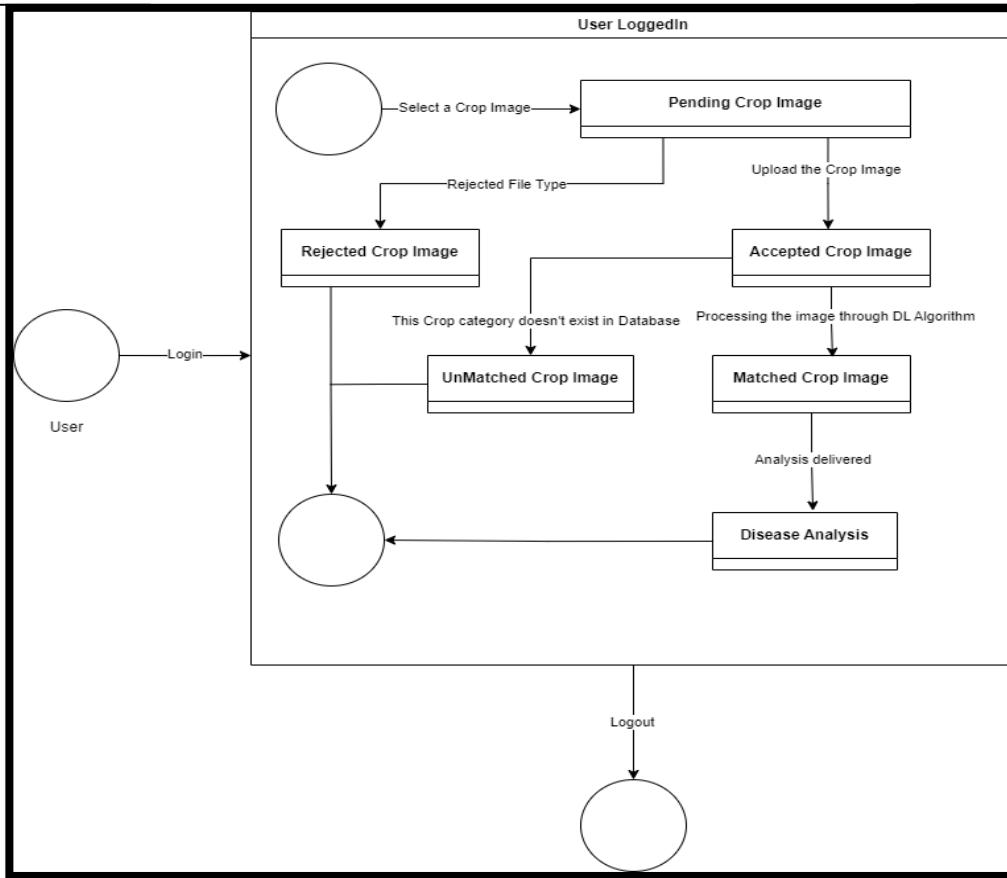
Class Diagram



ER Diagram

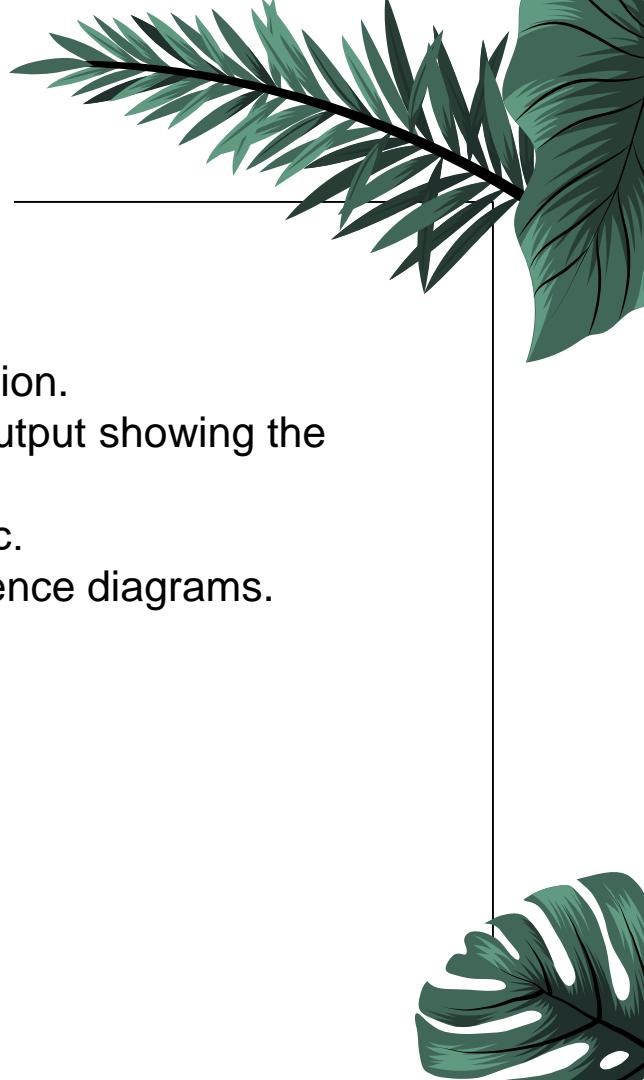


State Diagram



Sprint -2 Recap

- Designed the front end for the MVP.
- Image upload for uploading the plant image for detection.
- Weather forecast page with the select area and the output showing the weather in that area.
- Area page with details about that area's soil, crops etc.
- Diagrams such as architecture, conceptual and sequence diagrams.
- Home page and about us page
- Retrospective
- User Stories/ Acceptance criteria
- Application test cases
- Demo

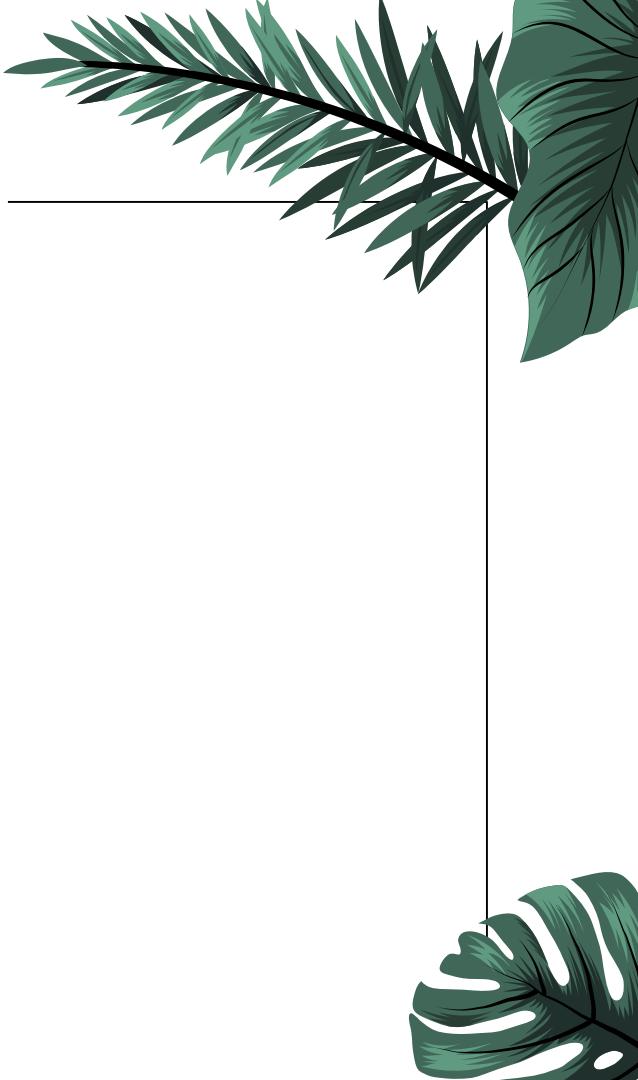


PRODUCT BACKLOG



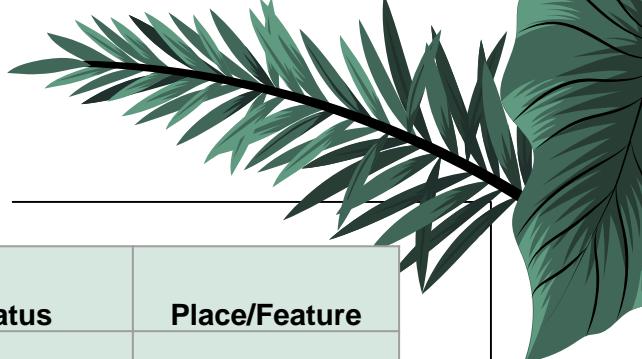
Project Backlog

- Database
- CSS Formatting
- Login Page Authentication
- Backend connection
- API Connection
- Weather Information / webpage
- Weather information / API
- Retrieval efficiency from Database
- Model Accuracy
- Deliverable 3
- Wiki page update





All the Users Stories or Tasks (Technical Stories)



Estimation	ID	User Story	Status	Place/Feature
3	PD-01	I want to upload an image of a plant leaf to detect diseases.	Done	Disease Detection
3	PD-02	I want to receive detailed information about the detected plant disease.	Done	Disease Detection
4	PD-03	I want to view prescriptions and suggested supplements for the detected disease.	Done	Disease Detection
6	PD-04	I want to know the various cures and preventive measures for the detected disease.	Done	Disease Detection
5	PD-05	I want to see the stages of the detected disease for better understanding.	Done	Disease Detection
9	PD-06	I want to verify if the image is right	Done	User Interface
10	PD-07	Send prompt to user if the image is not in correct format	Done	User Interface

Estimation	ID	User Story	Status	Place/Feature
6	PD-08	I want to know if this crop is available in database	Done	Database
6	PD-09	I want information about suitable crops and growth conditions for my area.	To be done	Agriculture Details
5	PD-10	I want to see the latest news related to agriculture and farming practices.	To be done	Agriculture News
4	PD-11	I want to receive notifications or updates about my uploaded plant reports.	To be done	Notification System
5	PD-12	I want to explore and learn about new farming technologies and practices.	To be done	Agriculture Information
2	PD-13	I want to create account on the website so that I can keep my account private and login using email/phone and password	To be done	Login and Authentication
2	PD-14	I want to login to the website to store my information.	To be done	Login
3	PD-15	I want to logout so that my information and reports are secure.	To be done	Logout

User Stories / Acceptance Criteria



User ID	Scenario	Summary	Criteria	Feature
1	A user wants to upload an leaf image	I want to upload an image of a plant leaf to detect diseases. when I go to the EcoScan website, I should be able to find an upload button. When I click on it and choose an image, the app should save the picture so that it can be processed.	EcoScan website will store the image for processing	Disease Detection
2	A user wants to know the detailed information	I want to receive detailed information about the detected plant disease. Given I am a, user when I upload the image I should be able to get detailed information about the disease detected	EcoScan website will store the information about the disease.	Disease Detection
3	A user wants to view prescriptions and supplements.	I want to view prescriptions and suggested supplements for the detected disease. I want to view the prescriptions and supplements suggested for the disease being detected.	EcoScan website will store the information about the disease.	Disease Detection

User ID	Scenario	Summary	Criteria	Feature
4	I want to know the various cures and preventive measures for the detected disease.			
	A user wants to know preventive measures.	Given that I am a user, I want to know the steps to be taken to cure and prevent detected disease.	EcoScan website will provide diagnosis for the disease.	Disease Detection
5	I want to see the stages of the detected disease for better understanding.			
	A user wants to look at the disease stages being detected.	I want to about all the stages detected for the particular disease.	EcoScan website will provide diagnosis for the disease.	Disease Detection
6	A user want to check if image uploaded is in right format.			
	A user wants to check weather condition.	I want to know if the image being uploaded is in right format	EcoScan website will check the image and its formatUser Interface	User Interface

User ID	Scenario	Summary	Criteria	Feature
7		Send prompt to user if the image is not in correct format		
7	A user wants know if the image uploaded is correct or not.	Given that I am a user, I want to receive the prompt/notification knowing if the image format is correct or no.	EcoScan website will check the image and its format	User Interface
8		A user want to know about image of the crop selected is available in the dataset.		
8	A user wants to check crop type exist or not.	I want to know if the crop I have selected is available in the dataset.	EcoScan website will check if particular crop is present in datasetAgriculture Information	Image Checking in Database
9		I want information about suitable crops and growth conditions for my area.		
9	A user wants to know about growth conditions for his area	I want to know which crop will be suitable for my area and how its growth will be.	EcoScan website will give information on crop suitability.	Agriculture Information

User ID	Scenario	Summary	Criteria	Feature
10		I want to see the latest news related to agriculture and farming practices.		
	A user wants latest news related to agriculture.	I want to know about the latest news that are related to agriculture and farming.	EcoScan website will provide latest news based on agriculture.	
11		I want to receive notifications or updates about my uploaded plant reports.		
	A user wants to receive notification about his plants.	Given that I am user, I want to get notified about the reports of my plant being uploaded.	EcoScan website will send notifications related to uploads.	Notification System
12		I want to explore and learn about new farming technologies and practices.		
	A user want to explore and learn about farming.	I want to know and explore about new farming techniques and practices.	EcoScan website gives information on farming techniques.	Agriculture Information

User ID	Scenario	Summary	Criteria	Feature
13	I want to create an account on the website so that I can keep my account private and login using email/phone and password			
	A user wants to create an account and login using his details.	I want to create an account and keep my account private with my login credentials.	EcoScan website will be able to create login credentials.	Home Page
14	I want to login to the website to store any information.			
	A user wants to login to the website to store the information.	I want to login to the website using my login details to store any information.	EcoScan website will log you in and store the information given.	Log In
15	I want to logout so that my information and reports are secure.			
	A user want to logout and secure the information.	I want to logout from my account to secure my information.	EcoScan website will log you out by securing your information.	Log Out

Sprint 3 BACKLOG



Sprint 3 Backlog

Estimation	ID	User Story	Status
9	PD-06	I want to check the current weather conditions in my area.	To be done
10	PD-07	I want to view detailed weather reports and forecasts for agriculture planning.	To be done
6	PD-08	I want to check soil type and recommended plantations for my geographical area.	To be done
6	PD-09	I want information about suitable crops and growth conditions for my area.	To be done
5	PD-10	I want to see the latest news related to agriculture and farming practices.	To be done
4	PD-11	I want to receive notifications or updates about my uploaded plant reports.	To be done
5	PD-12	I want to explore and learn about new farming technologies and practices.	To be done



Test Cases

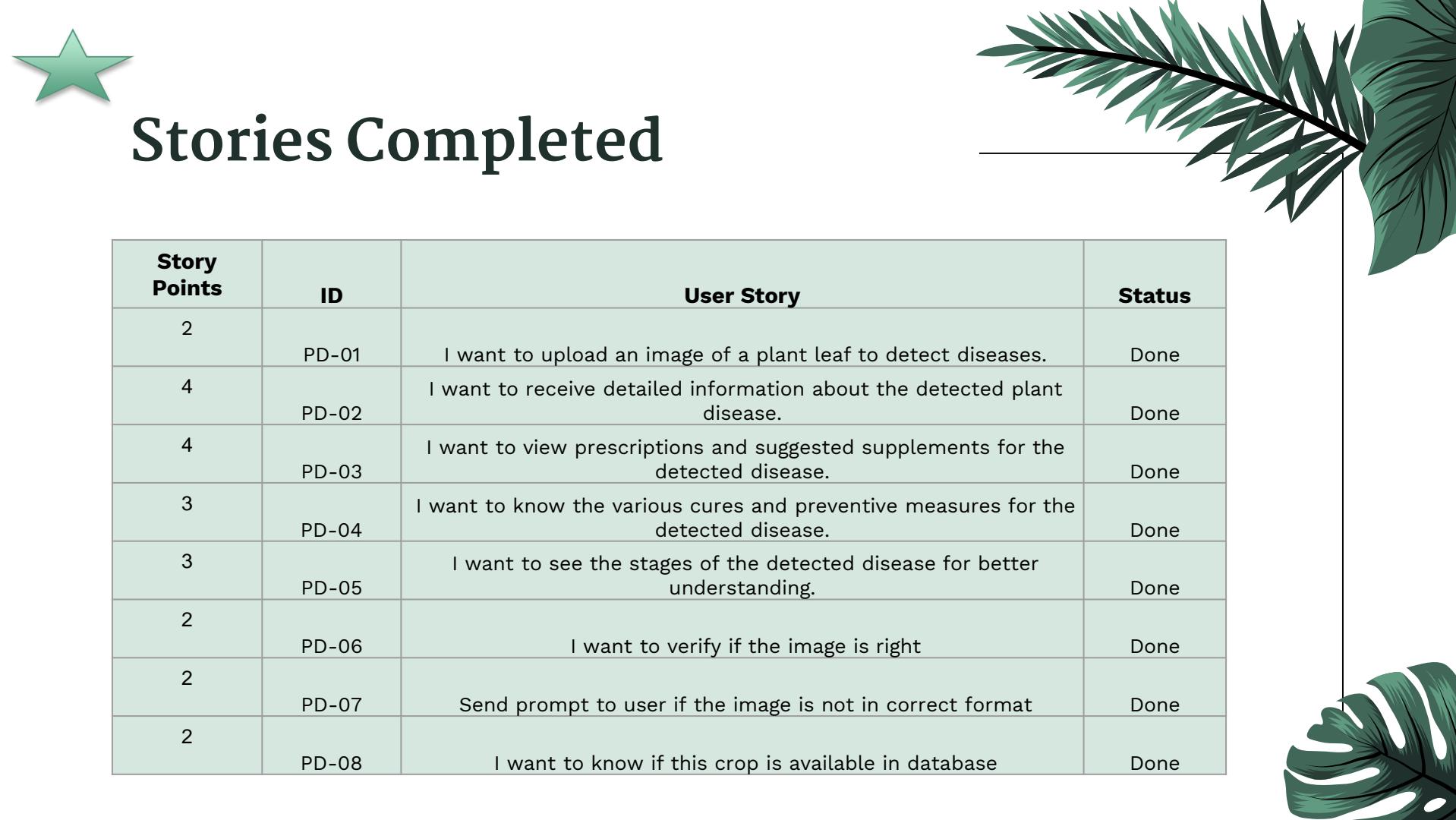


Functionality to Test	Test Case Scenarios	Expected Results	Actual Results	Pass/Fail
Image Upload Functionality	User uploads a valid image of a plant leaf.	The system should identify the disease, display prevention supplements, stage, and details.	The system correctly identifies the disease, displays relevant information, and provides details.	Pass
	User uploads an invalid image format.	The system should prompt an error message indicating the unsupported format.	The system correctly handles the invalid format and prompts the user with an appropriate message.	Pass
	User uploads an image that is not a plant leaf.	The system should prompt an error message indicating that the uploaded image is not valid.	The system correctly identifies the invalid content and provides a relevant error message.	Pass
Area Report Functionality	User requests a report for a specific area.	The system should display information on diseases, soil type, and plantation details for the area.	User is unable to request a report for an invalid or non-existent area.	Fail
	User requests a report for an invalid or non-existent area.	The system should prompt an error message indicating that the area is not found.	The system didn't prompt an error message indicating that the area is not found.	Fail
Soil Type and Plantation Details	User selects an area to view soil type and plantation details.	The system should display accurate information about the soil type and plantation in that area.	The system didn't display accurate information about the soil type and plantation in that area.	Fail
	User selects an area with no available data.	The system should inform the user that no data is available for the selected area.	The system didn't inform the user that no data is available for the selected area.	Fail

Functionality to Test	Test Case Scenarios	Expected Results	Actual Results	Pass/Fail
User Interface and Navigation	User navigates through the website without uploading an image.	The system should provide a user-friendly interface with clear navigation options.	The system didn't provide a user-friendly interface with clear navigation options.	Fail
	User attempts to access restricted areas without proper authentication.	The system should prompt the user to log in before accessing restricted areas.	The system didn't prompt the user to log in before accessing restricted areas.	Fail
Prevention Supplements Information	User views prevention supplements for a specific disease.	The system should display accurate information on prevention supplements for the disease.	The system displayed accurate information on prevention supplements for the disease.	Pass
	User views prevention supplements for a disease with no available data.	The system should inform the user that no data is available for prevention supplements.	The system informed the user that no data is available for prevention supplements.	Pass
Disease Stage Information	User checks the stage of a detected disease.	The system should show the current stage of the detected disease.	The system accurately displays the current stage of the detected disease.	Pass
	User checks the stage of a healthy plant (no disease detected).	The system should indicate that the plant is healthy and not in any disease stage.	The system correctly identifies and communicates that the plant is healthy with no disease stage.	Pass
Area Report with Historical Data	User requests a historical report for a specific area.	The system should provide historical data on diseases, soil type, and plantation details.	The system didn't provide historical data on diseases, soil type, and plantation details.	Fail
	User requests a historical report for an area with no historical data.	The system should inform the user that no historical data is available for the area.	The system didn't inform the user that no historical data is available for the area.	Fail



Functionality to Test	Test Case Scenarios	Expected Results	Actual Results	Pass/Fail
User Profile and Preferences	User updates their profile information.	The system should reflect the updated user profile information.	The system couldn't reflect the updated user profile information.	Fail
	User sets preferences for notification alerts.	The system should send notification alerts based on the user's preferences.	The system couldn't send notification alerts based on the user's preferences.	Fail
Feedback and Support	User submits feedback through the website.	The system should receive the feedback and store it for analysis.	The system couldn't receive the feedback and store it for analysis.	Fail
	User accesses the support section for assistance.	The system should provide relevant support information and contact details.	The system couldn't provide relevant support information and contact details.	Fail



Stories Completed

Story Points	ID	User Story	Status
2	PD-01	I want to upload an image of a plant leaf to detect diseases.	Done
4	PD-02	I want to receive detailed information about the detected plant disease.	Done
4	PD-03	I want to view prescriptions and suggested supplements for the detected disease.	Done
3	PD-04	I want to know the various cures and preventive measures for the detected disease.	Done
3	PD-05	I want to see the stages of the detected disease for better understanding.	Done
2	PD-06	I want to verify if the image is right	Done
2	PD-07	Send prompt to user if the image is not in correct format	Done
2	PD-08	I want to know if this crop is available in database	Done



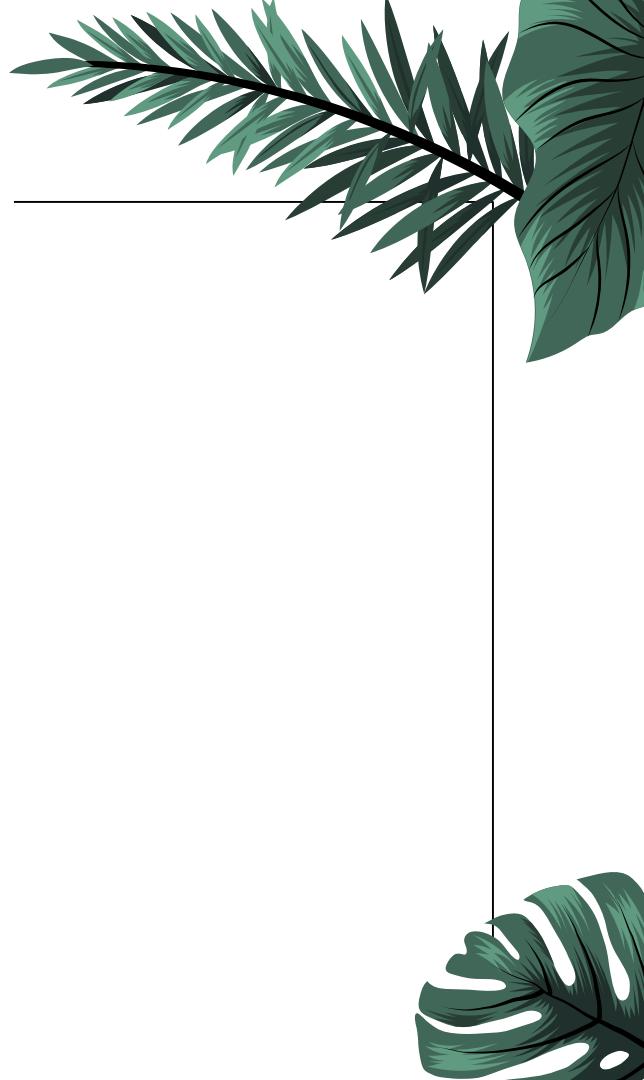
Métrices





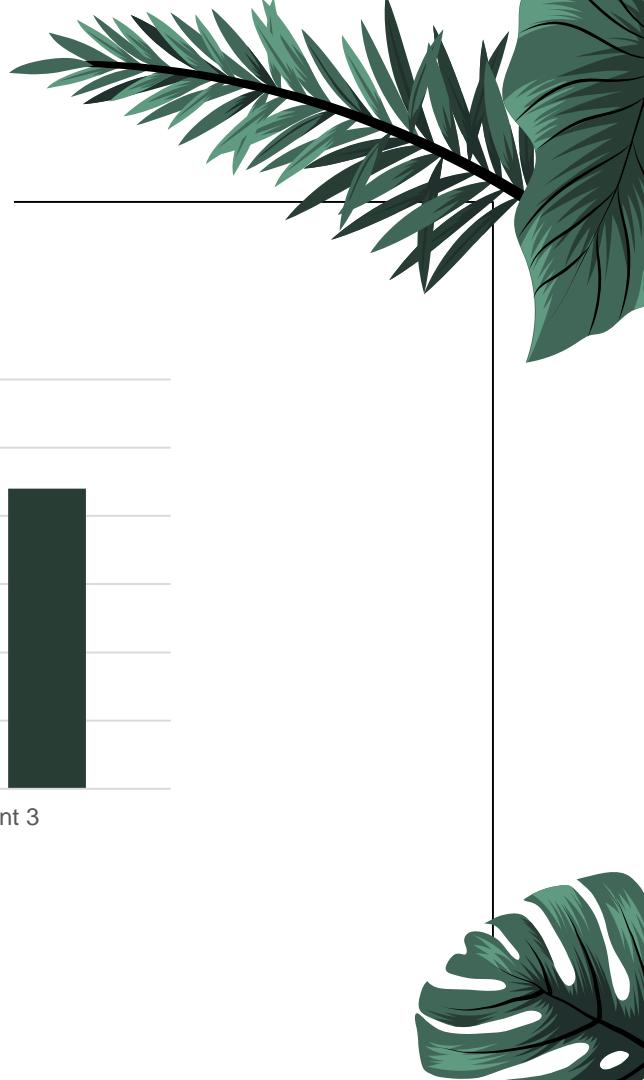
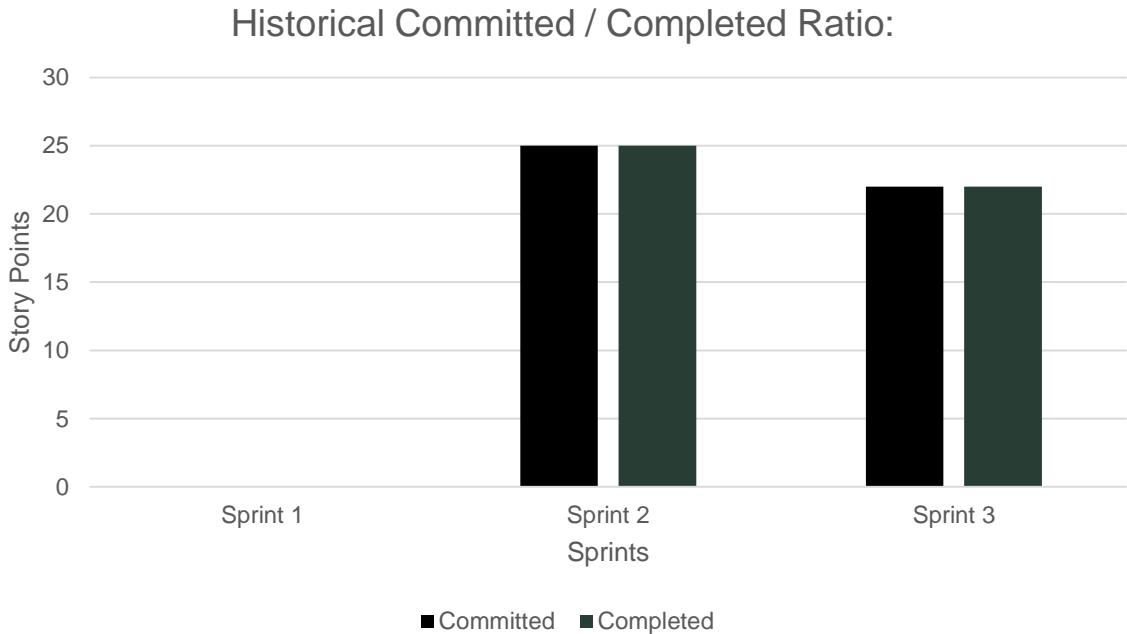
Team Velocity – this sprint

22 Story Points



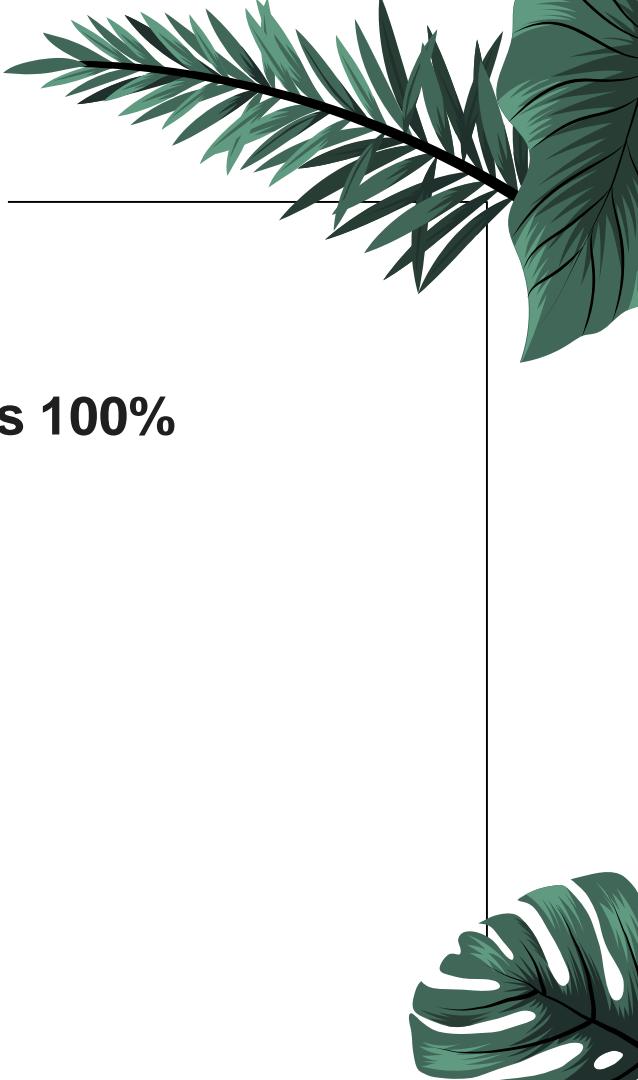


Team's Historical Average

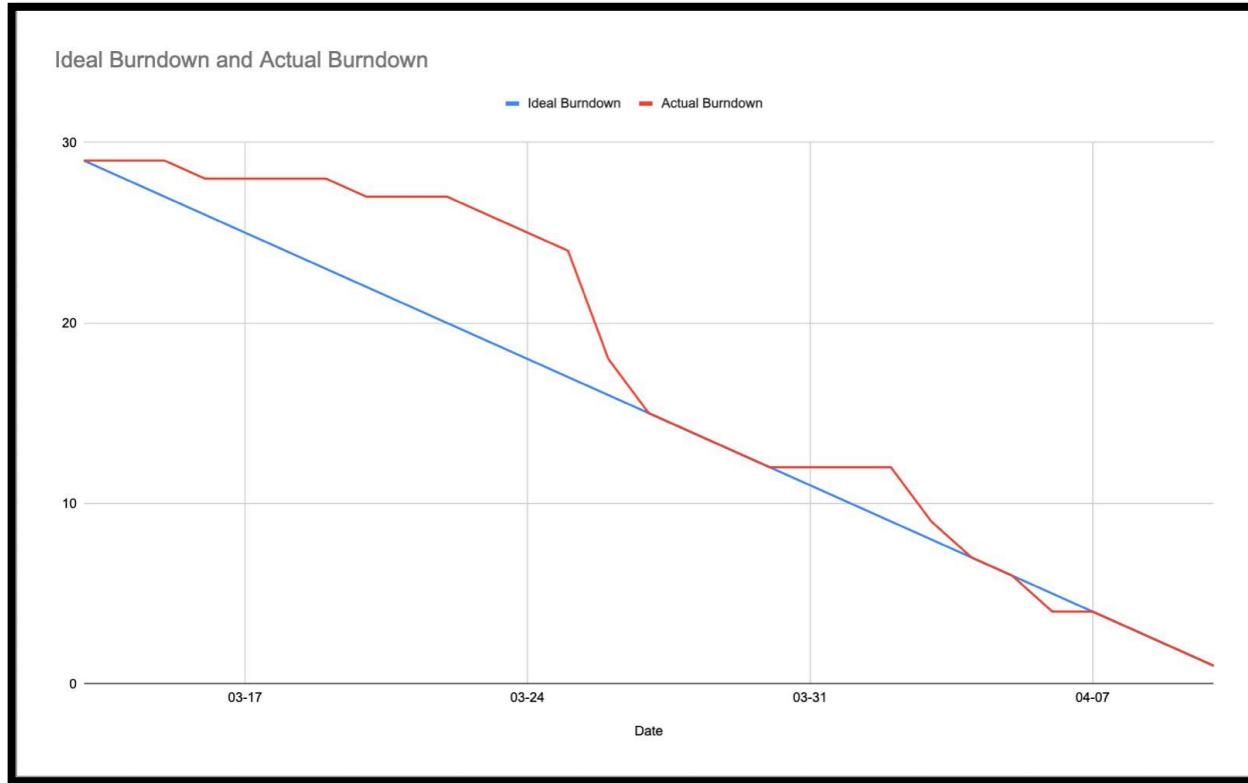


Completed Ratio

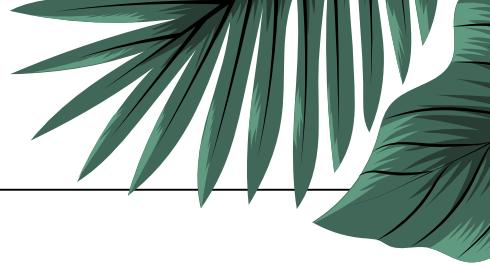
completed/committed ratio = 22/22, which is 100%



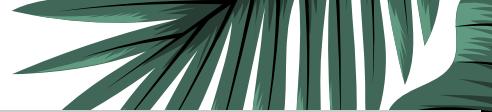
Burn down chart – Sprint 3



RETROSPECTIVE



IDEA BOARD



Sprint-3 EcoScan Retrospective

What went well +

Drafting the technical Paper as per IEEE Format	achieving the desired results and learning while collaborating	updating tasks on jira
+ 5	+ 5	+ 4
task allocation and effective communication	ML models with good accuracy and less losses	helping each other and completing task on time
+ 3	+ 3	+ 3
Learning from previous retros and other teams	Sprint 3 story points mostly covered	All test cases completed for Sprint 3
+ 3	+ 2	+ 2
Learning and Adapting to new skills	Team Collaboration	team coordinated well
+ 2	+ 1	+ 1
Decision on what Algorithm to be used	were clear about the things that were supposed to be completed	Resolving the issues while developing the ML model
+ 1	+ 1	+ 1
Good communication among all	Completing the task on time	setting achievable deadlines helped
+ 0	+ 0	+ 0
being vocal and helping each other when stuck at a point	able to complete almost all the tasks assigned in sprint 3	Asking for help whenever stuck in the ML part
+ 0	+ 0	+ 0
sprint 4 goals and tasks are clear	great communication between team for getting results for MVP	
+ 0	+ 0	

What can be improved +

updating tasks on git	team members joining the meetings strictly on time unless any emergency	working on other features after completing MVP to learn more
+ 3	+ 2	+ 2
work and personal time balancing	Better understanding of integration	Prioritizing the important tasks first
+ 2	+ 1	+ 1
More Data for training(if time permits)	understanding and making the adjustments by everyone's time and achieving the completion of tasks	Exploring different plant leaves for disease detection
+ 0	+ 0	+ 0
Adding Features that initially time did not permit	working on backend connectivity	improving the connectivity
+ 0	+ 0	+ 0

Action Items +

backend and database connectivity	Making sprint 4 agendas clear and adding better stories	User Authentication
+ 4	+ 4	+ 3

Sprint-3 EcoScan Retrospective

What went well +

Drafting the technical Paper as per IEEE Format + 5	achieving the desired results and learning while collaborating + 5	updating tasks on jira + 4
--	---	-------------------------------

task allocation and effective communication + 3	ML models with good accuracy and less losses + 3	helping each other and completing task on time + 3
--	---	---

Learning from previous retros and other teams + 3	Sprint 3 story points mostly covered + 2	All test cases completed for Sprint 3 + 2
--	---	--

Learning and Adapting to new skills + 2	Team Collaboration + 1	team coordinated well + 1
--	---------------------------	------------------------------

Decision on what Algorithm to be used + 1	were clear about the things that were supposed to be completed + 1	Resolving the issues while developing the ML model + 1
--	---	---

Good communication among all + 0	Completing the task on time + 0	setting achievable deadlines helped + 0
-------------------------------------	------------------------------------	--

being vocal and helping each other when stuck at a point + 0	able to complete almost all the tasks assigned in sprint 3 + 0	Asking for help whenever stuck in the ML part + 0
---	---	--

sprint 4 goals and tasks are clear + 0	great communication between team for getting results for MVP + 0	
---	---	--

What can be improved +

updating tasks on git + 3	team members joining the meetings strictly on time unless any emergency + 2	working on other features after completing MVP to learn more + 2
------------------------------	--	---

work and personal time balancing + 2	Better understanding of integration + 1	Prioritizing the important tasks first + 1
---	--	---

More Data for training(if time permits) + 0	understanding and making the adjustments by everyone's time and achieving the completion of tasks + 0	Adding Features that initially time did not permit + 0
--	--	---

Exploring different plant leaves for disease detection + 0	working on backend connectivity + 0	improving the connectivity + 0
---	--	-----------------------------------

Action Items +

backend and database connectivity + 4	Making sprint 4 agendas clear and adding better stories + 4	User Authentication + 3
--	--	----------------------------



What went well?

- Drafting of the technical paper as per IEEE format.
- Achieving the desired results and learning with collaboration.
- Updating the tasks on JIRA.
- Task allocation and effective communication.
- ML models with good accuracy and less losses.



What can be improved?

- Updating the tasks on Git.
- Team members joining the meetings strictly on time unless any
- Emergency.
- Working on other features after completing the MVP to learn more.
- Work and personal time balancing.



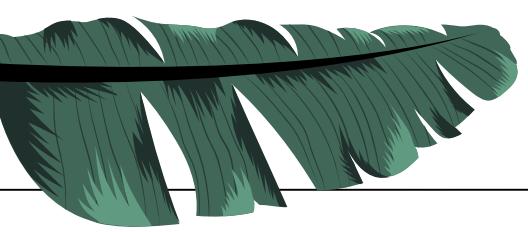
Action Items?

- Backend and database connectivity.
- Making sprint -4 agenda clear and adding better stories
- User authentication.



CODE SNIPPET

Training code



```
test.py 9+ | train.ipynb X  
train.ipynb > INPUT_SHAPE = (224,224)  
+ Code + Markdown | Run All | Clear All Outputs | Outline ...  
Select Kernel
```

Click here to ask Blackbox to help you code faster

```
data_gen_train = ImageDataGenerator(rescale = 1/255.0,featurewise_center=False, # set input mean to 0 over the dataset  
samplewise_center=False, # set each sample mean to 0  
featurewise_std_normalization=False, # divide inputs by std of the dataset  
samplewise_std_normalization=False, # divide each input by its std  
zca_whitening=False, # apply ZCA whitening  
rotation_range = 30, # randomly rotate images in the range (degrees, 0 to 180)  
zoom_range = 0.2, # Randomly zoom image  
width_shift_range=0.1, # randomly shift images horizontally (fraction of total width)  
height_shift_range=0.1, # randomly shift images vertically (fraction of total height)  
horizontal_flip = True, # randomly flip images  
vertical_flip=False,  
validation_split=0.3)  
data_gen_test = ImageDataGenerator(rescale = 1/255.0)
```

Python



```
Click here to ask Blackbox to help you code faster  
x_train = data_gen_train.flow_from_directory(train_path,  
                                              batch_size=BATCH_SIZE,  
                                              class_mode='categorical',  
                                              target_size=INPUT_SHAPE,subset='training')  
  
x_test = data_gen_train.flow_from_directory(train_path,  
                                              batch_size=BATCH_SIZE,  
                                              class_mode='categorical',  
                                              target_size=INPUT_SHAPE,subset='validation')
```

Python

... Found 38029 images belonging to 38 classes.
Found 16276 images belonging to 38 classes.

Testing code

```
test.py 9+ X | train.ipynb  
test.py ...  
64  
65  
66 def load_image(img_path, show=False):  
67     img = cv2.imread(img_path)  
68     img = cv2.resize(img,(224,224))  
69     img = img.reshape(1,224,224,3)  
70     return img  
71  
72  
73 def predict(image_path):  
74     i = load_img(image_path, target_size=(224,224))  
75     i = img_to_array(i)  
76     i = i.reshape(1, 224,224,3)  
77  
78     out = model.predict(i)[0]  
79     pred = out.argmax()  
80     pr = out[pred]*100  
81     title = disease_info['disease_name'][pred]  
82     if pred==75:  
83         title+= " (Stage III)"  
84     elif pred<75 and pred>50:  
85         title+= " (Stage II)"  
86     elif pred<=50:  
87         title+= " (Stage I)"  
88     description =disease_info['description'][pred]  
89     symptoms = disease_info['symptoms'][pred]  
90     prevent = disease_info['precautions'][pred]  
91     image_url = disease_info['image url'][pred]  
92     supplement_name = supplement_info['supplement name'][pred]  
93     supplement_image_url = supplement_info['supplement image'][pred]  
94     supplement_buy_link = supplement_info['buy link'][pred]  
95     return title,description,symptoms,prevent,supplement_name  
96  
97 print(predict("leaf.jpg"))
```



PLAN FOR SPRINT 4



PLAN FOR SPRINT 4

■	▼ Deliverable 4(Sprint 4) 9 Apr – 2 May (9 issues)	0	0	0	Complete sprint	...
Deliverable 4 (Sprint 4), Wikipage-4, Updated Techpaper, Peer-to-Peer 4, User Manual, and Deployment Document						
	CPC-21 Database			TO DO	▼	
	CPC-26 css formatting			TO DO	▼	
	CPC-22 Login Page authentication / firebase			TO DO	▼	
	CPC-20 Backend connection			TO DO	▼	
	CPC-29 Api connection			TO DO	▼	
	CPC-30 Weather info feature / webpage			TO DO	▼	
	CPC-31 Weather info feature / api			TO DO	▼	
	CPC-32 Retrieval efficiency from db			TO DO	▼	
	CPC-33 model accuracy			TO DO	▼	

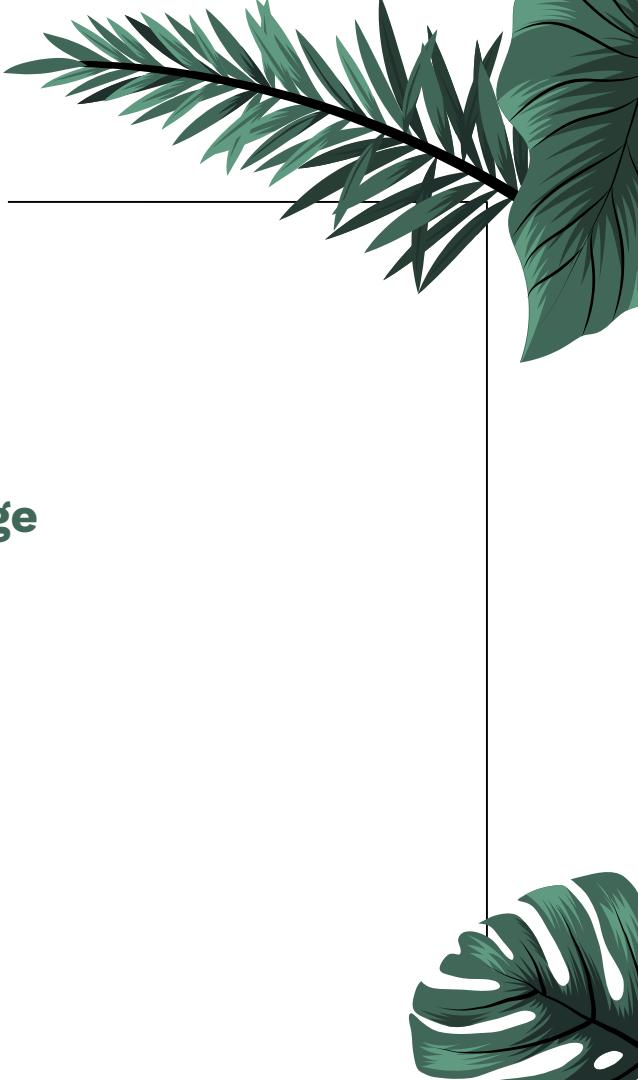
PROJECT DEMO





Show live demo

Live Demo is available on our Wiki Page





App screenshots



APPLICATION SCREENSHOT

H O M E P A G E

- A welcoming header that introduces the user to the application, setting a positive and inviting tone.
- A section featuring the latest news related to agriculture, keeping users informed about relevant updates and developments.
- Various buttons strategically placed to redirect users to different pages within the application, providing easy access to specific features or sections.
- Conveniently placed links or buttons that swiftly redirect users to the application's social media platforms.
- A dedicated section showcasing statistics related to the application.

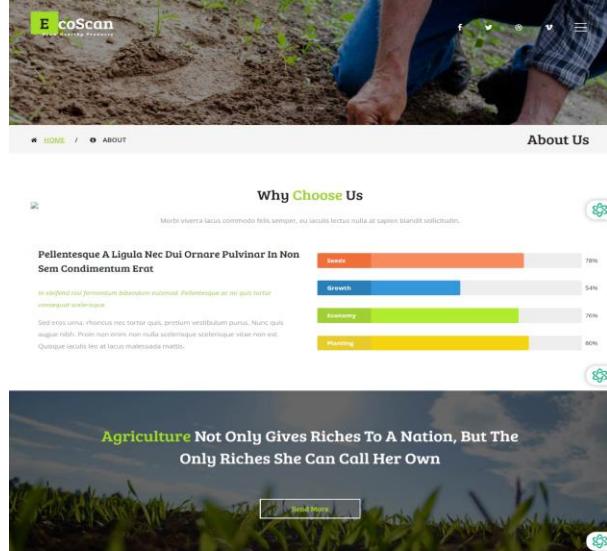


H O M E P A G E

APPLICATION SCREENSHOT

ABOUT US PAGE

- A friendly and inviting introduction at the top of the page, creating a positive tone and making users feel welcomed upon entering the application.
- Clearly labeled tabs, such as 'Home,' 'Area Details,' 'About Us,' etc., facilitating easy navigation and ensuring users can quickly access specific sections of the application.
- A dedicated portion of the page explaining the reasons for users to choose the application. This section likely highlights the unique features, benefits, or values that set the application apart.
- Information about the application's team, providing users with insights into the individuals behind the scenes. This personal touch can enhance trust and connection.

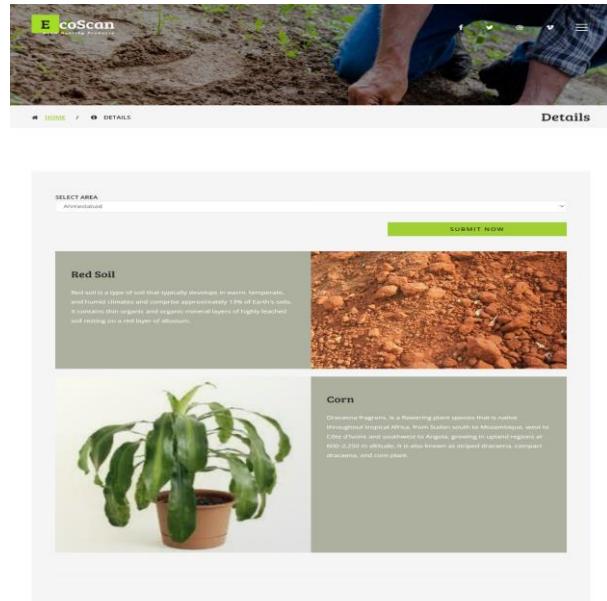


A B O U T U S

APPLICATION SCREENSHOT

AREA DETAILS

- User-friendly interface allowing users to select their desired area, enhancing customization and providing relevant information based on geographical preferences.
- Detailed information on the soil types in the selected area, aiding users in understanding the soil composition and its suitability for different types of plantations.
- A section suggesting suitable plantations for the chosen area, helping users make informed decisions about what crops or plants thrive in the specific soil conditions of their selected region.



A r e a D e t a i l s

APPLICATION SCREENSHOT

WEATHER FORECAST PAGE

- An interactive feature allowing users to choose a specific area for which they want to check the weather forecast, providing localized and relevant information.
- A visually appealing and user-friendly layout that facilitates easy comprehension of weather data, enhancing the overall user experience.
- The ability to refresh or update the weather information in real-time, keeping users informed with the latest and most accurate forecasts.
- Design considerations to ensure the weather forecast page is accessible and user-friendly across various devices, including desktops, tablets, and cell phones.



Weather Forecasting

A screenshot of a weather forecast details page. At the top, there is a search bar labeled "SELECT AREA" with "Ahmedabad" typed in, and a "SUBMIT NOW" button. Below this, the city name "Ahmedabad" is displayed in bold. To its right, a series of weather statistics are listed:

- Maximum Temperature : 26.020000000004
- Temperature : 26
- Minimum Temperature : 26.020000000004
- Humidity : 22
- Pressure : 1013
- Weather Report : smoke

The background of this section is a light gray color.

Weather Details

Technical Paper

Leaf Disease Detection System Using Convolutional Neural Networks and Image Processing

Omkar Gurav¹, Rudra Chobe², Shriya Harai³, Ritika Chougala⁴, Lokeshwar Anchuri⁵, Niyati Ghagada⁶, Uma Maheshwari Addala⁷, Mukesh Sudha⁸

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Seidenberg School of Computer Science and Information Technology,

Pace University – New York.

Abstract— Plant diseases pose a significant threat to crop health and yield, necessitating timely and accurate detection methods. Traditional manual inspection by experts can be time-consuming and error prone. This paper presents Eco Scan, an innovative leaf disease detection system leveraging convolutional neural networks (CNNs) and image processing techniques. Eco Scan aims to provide farmers with a user-friendly interface for uploading crop images and receiving real-time disease analysis. By integrating advanced technology into agriculture, the system seeks to optimize crop health monitoring, minimize losses, and promote sustainable farming practices. The paper outlines the system architecture, key features, and performance evaluation. Eco Scan demonstrates promising results in accurately identifying various plant diseases, offering the potential to revolutionize disease management in agriculture.

Keywords— *Food additives, preservatives, optical character recognition, image processing, food packaging*

of plant leaves and receiving real-time disease analysis. By leveraging state-of-the-art technology,

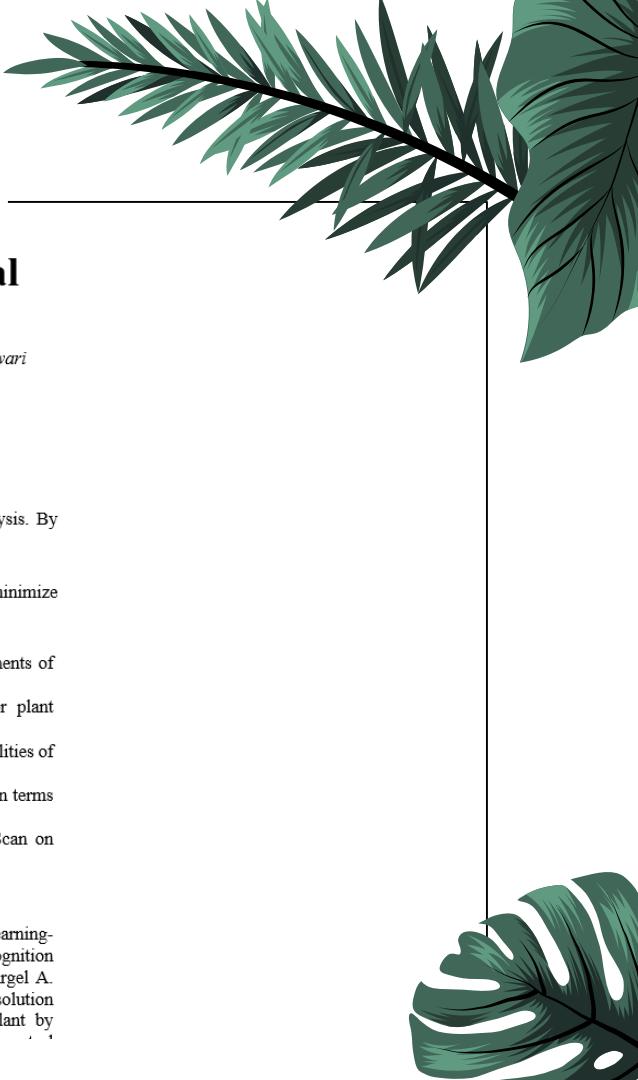
the system seeks to optimize crop health monitoring, minimize losses, and promote sustainable farming practices.

The main objectives of this paper are as follows:

1. To present the architecture and key components of the Eco Scan system.
2. To discuss the CNN model employed for plant disease detection and its training process.
3. To showcase the user interface and functionalities of the Eco Scan web application.
4. To evaluate the performance of the system in terms of accuracy and efficiency.
5. To highlight the potential impact of Eco Scan on agriculture and its prospects.

II. LITERATURE STUDY

1. Automated Image Capturing System for Deep Learning-based Tomato Plant Leaf Disease Detection and Recognition [1] Author: Robert G. de Luna, Elmer P. Dadios, Argel A. Bandala [1]. This research aims to elaborate a novel solution to quickly diagnose disease wellness in tomato plant by



Wiki Page Link

<https://github.com/htmw/2024S-AlgoAvengers>



THANK YOU

