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Student Kit

Objective

The objective of our Image Segmentation & Recognition project is to develop an advanced system that enhances personal identification through accurate facial recognition. We aim to provide a user-friendly platform that effectively addresses challenges related to varying race, age, gender, facial coverings, and image quality. Our goal is to empower users by enabling reliable and efficient identification in diverse environments, utilizing cutting-edge algorithms and real-time analysis. Through this project, we seek to promote transparency, security, and accessibility in facial recognition technology, ultimately contributing to its broader application in various sectors.

Requirements Specification (RS)

A Requirements Specification (RS) document for the Image Segmentation & Recognition project outlines the functional and non-functional requirements of the system. These requirements will guide the development process and ensure that the system effectively meets the needs of its users.

Sr No.	Requirement	Essential/Desirable	Description	Remarks
RS1	The system should have a login feature	Essential	A welcome page should appear when the URL is invoked, providing users with login options.	
RS2	The system should include help screens	Essential	Help about the various features of the system should be provided in sufficient detail in a Q&A format.	Relevant help screens are desirable.

RS3	The system should lock the login ID after 3 failed attempts	Desirable	This feature will improve the robustness of the application by preventing unauthorized access.	
RS4	The system should enable easy navigation	Essential	Users should be able to navigate from one screen to another seamlessly for an efficient experience.	
RS5	The system should be extensible for new tasks and users	Essential	This feature will allow the system to adapt to changes and accommodate new features without complication.	
RS6	Users should be able to upload and view images	Essential	Users must be able to upload images for segmentation and recognition, ensuring content is visible	
RS7	The system should be reusable and portable	Essential	The application should function as a web-based or standalone system to ensure versatility in deployment.	

RS8	User interface should differ based on user role	Essential	Screens available for navigation should be different based on whether the user is a buyer or seller, ensuring role-based functionality.	
RS9	The system should have a logout option	Essential	Users should have the ability to log out securely from their accounts.	

Database Fields Specification

User Table

No.	Field Name	Range of valid values for the field	Remarks
1	User id	1 to 10000	Primary key, uniquely identifies each user.
2	User_Name	Up to 15 characters in length	Must not contain special characters except underscores.
3	Email_ID	Up to 30 characters (valid email format)	Must follow standard email rules.
4	Password	Up to 15 characters in length .	Special characters, including underscores, are allowed.
5	Full_Name	Up to 50 characters in length	Up to 50 characters in length
6	Phone_Number	Up to 10 digits	Should be before last date
7	Account_Type	Up to 10 characters in length	Specifies the role (e.g., admin, user).

Image Data Table

No	Field Name	Range of Valid Values for the Field	Remark
1	Image_ID	1 to 10000	Primary key, uniquely identifies each image.
2	User_ID	1 to 10000	Foreign key referencing the User table.
3	Image_Path	Up to 255 characters	Path or URL to the stored image.
4	Date_Uploaded	Date	Date when the image was uploaded.
5	Status	Up to 15 characters in length	Status of the image (e.g., processed, pending).

Recognition Log Table

No	Field Name	Range of Valid Values	Remark
1	Log_ID	1 to 10000	Primary key, uniquely identifies each log entry.
2	User-ID	1 to 10000	Foreign key referencing the User table.
3	Image_ID	1 to 10000	Foreign key referencing the Image Data table.
4	Recognition_Date	Date	Date when the recognition occurred.

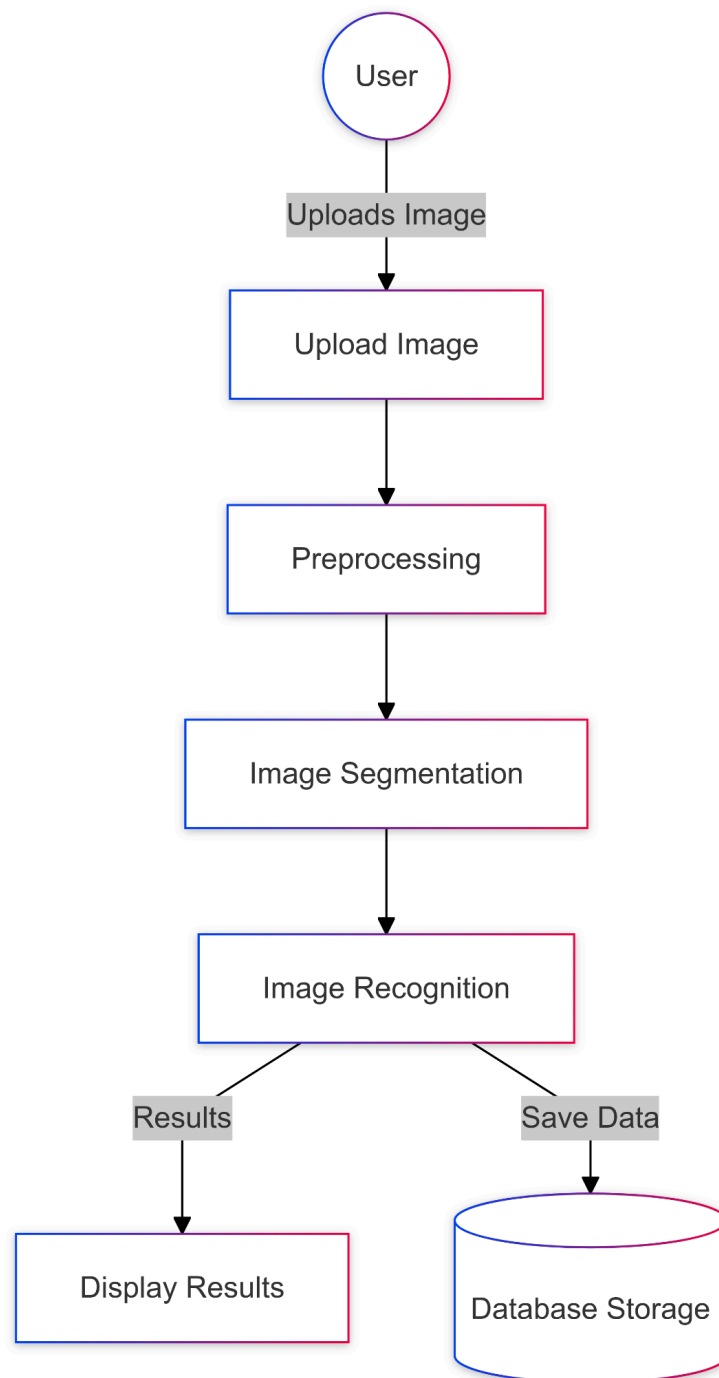
5	Recognition_Status	Up to 15 characters in length	Status of recognition (e.g., successful, failed).
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Performance Metrics Table

No	Field Name	Range of Valid Values for the Field	Remark
1	Metric_ID	1 to 10000	Primary key, uniquely identifies each metric.
2	Image_ID	1 to 10000	Foreign key referencing the Image Data table.
3	Accuracy	0.0 to 100.0	Percentage accuracy of recognition.
4	Processing_Time	Up to 10 seconds	Time taken for the recognition process.
5	Date_Recorded	Date	Date when the metrics were recorded.

High Level/Detailed Design (HLD/DD)

Overview of the system



Design Components

The system features various screens tailored to the specific roles of users within the organization.

Buyer/Consumer:

- **User Registration and Login:**
 - Interface for new users to register and existing users to log in.
- **Dashboard**
 - Overview of user activities, recent transactions, and relevant updates
- **Search and Filters**
 - Tools for users to search for products and apply filters based on criteria such as type, price, or availability.
- **Product Listings**
 - Display of available products with details like images, descriptions, and pricing
- **Transaction History**
 - Record of past purchases and interactions for user reference.
- **Support and Help Center**
 - Access to FAQs, support articles, and contact information for assistance.
- **Feedback and Ratings**
 - Ability for users to leave reviews and ratings for products and services.

Organization User:

- **Organization User Registration and Login:**
 - Interface for account creation and secure login, with password recovery options.
- **Organization Dashboard:**
 - Central overview of activities, key metrics, and quick links to functionalities.
- **User Management:**
 - Tools for managing organization users, including roles, additions, edits, and deactivations.
- **Analytics and Reports:**
 - Visual dashboards showcasing performance metrics with customizable reporting filters.
- **System Settings:**
 - Configuration options for security settings, notifications, and product listing parameters.
- **Support and Feedback Management:**
 - Interface to manage support inquiries, analyze feedback, and track resolution status.

Test-Plan (TP)

The test plan (TP) for the Image Segmentation & Recognition System outlines a comprehensive strategy to ensure the platform's functionality, performance, and security. It includes various testing stages such as unit testing, integration testing, and user acceptance testing. The plan specifies test cases, success criteria, and assigned teams for each phase. Critical aspects covered include user registration and authentication, image uploading and processing, segmentation accuracy, facial recognition, performance testing under varying loads, and security testing to identify vulnerabilities. Usability and accessibility testing focus on delivering an intuitive experience for users. Ultimately, the test plan aims to validate that the system operates reliably, securely, and efficiently while meeting business requirements and adhering to industry standards.

Important Note: Test cases cover all aspects of the system as stated in the Requirements Specification (RS) document.

Se No.	Test Case Title	Description	Expected Result	Requirement in RS Table	Results
1	Successful User Registration	Attempt to register a new user with valid details	Registration should be successful	RS1	Passed
2	Unsuccessful User Registration due to Invalid Email	Attempt to register with an invalid email format.	Registration should fail with an error message.	RS2	Passed
3	Successful User Login	Log in using valid credentials.	Login should be successful and redirect to the dashboard.	RS3	Passed

4	Unsuccessful Login due to Wrong Password	Log in using an incorrect password.	Login should fail with an error 'Invalid Password'.	RS4	Passed
5	Unsuccessful Login due to Invalid User ID	Log in using an invalid user ID.	Login should fail with an error 'Invalid User ID'.	RS5	Passed
6	Successful Image Upload	Upload a valid image for processing.	Image should upload successfully and provide feedback.	RS6	Passed
7	Image Segmentation Accuracy	Test segmentation on various images to assess accuracy.	Segmentation should match expected outcomes.	RS7	Passed
8	Facial Recognition Accuracy	Test recognition on known faces in images.	Recognition should return correct identities.	RS8	Passed
9	System Performance under Load	Conduct load testing with multiple users and image uploads.	System should maintain performance without crashes.	RS9	Passed

10	Security Testing	Test for vulnerabilities such as SQL injection and XSS	No vulnerabilities should be found.	RS10	Passed
11	User Feedback and Rating System	Test functionality of providing feedback and ratings.	Feedback should be recorded successfully.	RS11	Passed