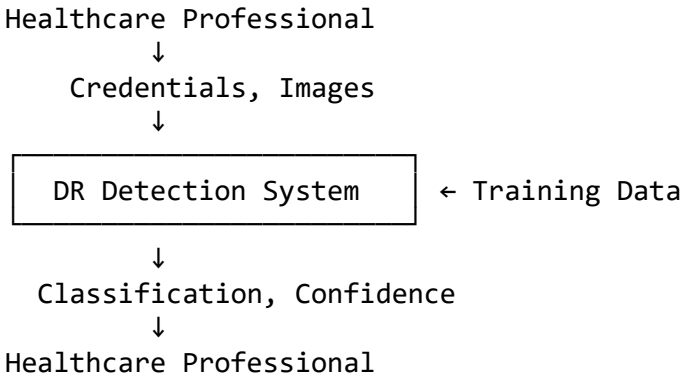
Data Flow Diagrams and User Stories

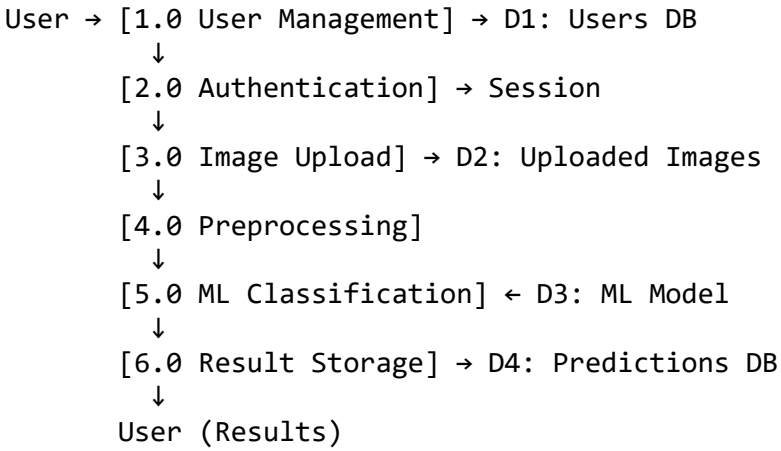
Diabetic Retinopathy Detection System

DATA FLOW DIAGRAMS

Level 0: Context Diagram



Level 1: System Overview



USER STORIES

Epic 1: User Management

US-1.1: User Registration
As a healthcare professional, I want to create an account so that I can access DR detection features.

Acceptance Criteria: - Enter name, email, password - System validates email format and password match - Prevents duplicate email registration - Redirects to login page

Priority: HIGH | **Story Points:** 3

US-1.2: User Login
As a registered user, I want to log into the system so that I can access my dashboard.

Acceptance Criteria: - Enter email and password - System validates credentials - Creates secure session - Redirects to home page

Priority: HIGH | **Story Points:** 3

Epic 2: Image Upload & Processing

US-2.1: Upload Retinal Image
As a healthcare professional, I want to upload a retinal fundus image so that the system can analyze it for DR.

Acceptance Criteria: - Select image file (PNG, JPG, JPEG) - System validates file size (max 16MB) - Image preview shown after upload - Clear error messages for invalid files

Priority: HIGH | **Story Points:** 5

Epic 3: DR Classification

US-3.1: Get DR Prediction
As a healthcare professional, I want to receive automated DR classification so that I can quickly assess patient condition.

Acceptance Criteria: - System processes image within 5 seconds - Result shows one of 5 DR classes - Confidence score displayed as percentage - Result is clearly visible

Priority: CRITICAL | **Story Points:** 8

US-3.2: View Confidence Score
As a healthcare professional, I want to see the confidence level so that I can assess result reliability.

Acceptance Criteria: - Confidence shown as percentage (0-100%) - Visual indicator for confidence levels - All class probabilities available

Priority: HIGH | **Story Points:** 3

Epic 4: Results Management

US-4.1: View Prediction Results
As a healthcare professional, I want to see prediction results clearly so that I can document and act on them.

Acceptance Criteria: - Shows DR classification and confidence - Displays uploaded image for reference - Includes timestamp and user name - Option to predict another image

Priority: HIGH | **Story Points:** 3

US-4.2: Store Prediction History
As a healthcare professional, I want my predictions saved so that I can track patient screening history.

Acceptance Criteria: - Each prediction stored in database - Includes user, result, confidence, timestamp - Data retrievable for future reference

Priority: MEDIUM | **Story Points:** 3

Epic 5: System Usability

US-5.1: Responsive Interface
As a user on any device, I want the interface to work on my device so that I can access the system anywhere.

Acceptance Criteria: - Adapts to desktop, tablet, mobile - Touch-friendly on mobile - Readable text on all screens - Works on major browsers

Priority: MEDIUM | **Story Points:** 5

US-5.2: Fast System Response
As a healthcare professional, I want the system to respond quickly so that I can efficiently process patients.

Acceptance Criteria: - Page loads in under 3 seconds - Prediction completes in under 5 seconds - Loading indicators shown - Smooth user experience

Priority: HIGH | **Story Points:** 3

USER JOURNEY MAP

First-Time User Performing DR Screening

Phase 1: Discovery → Visits website → 😐 Curious
Phase 2: Registration → Creates account → 😊 Interested
Phase 3: Login → Enters credentials → 😊 Hopeful
Phase 4: Upload → Selects image → 😐 Focused
Phase 5: Processing → Waits for results → 😟 Anxious
Phase 6: Results → Reviews prediction → 😊 Satisfied
Phase 7: Action → Documents result → 😊 Confident

USE CASE SCENARIOS

Scenario 1: Routine Screening

Actor: General Practitioner
Goal: Screen diabetic patient for DR

Flow: 1. Doctor logs into system 2. Uploads patient's retinal image 3. System processes and classifies 4. Doctor reviews result and confidence 5. Doctor documents in patient file 6. Determines next steps

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Scenario 2: Mass Screening Program

Actor: Public Health Nurse
Goal: Screen multiple patients in community clinic

Flow: 1. Nurse logs in 2. For each patient: - Uploads image - Records result - Notes patient ID - Clicks "Predict Another" 3. Compiles results 4. Identifies patients needing follow-up