Project Design Phase-II

Solution Requirements (Functional & Non-functional)

Date: 29 June 2025

Team ID: LTVIP2025TMID46346

Project Name: HematoVision Blood Cell Classification using Transfer Learning

Maximum Marks: 4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration & Authentication	Registration through Form
		Registration through Gmail
		Registration through LinkedIn
FR-2	User Account Verification	Confirmation via Email
		Confirmation via OTP
FR-3	Blood Cell Image Upload & Management	Single image upload
		Batch image upload
		Image format validation (JPEG, PNG)
		Image quality assessment
FR-4	Blood Cell Classification Engine	Pre-trained model integration (ResNet, VGG, etc.)
		Transfer learning implementation
		Multi-class classification (WBC, RBC, Platelets)
		Confidence score display
FR-5	Results Management & Visualization	Classification results display
		Probability distribution charts
		Export results (PDF, CSV)
		Historical results tracking
FR-6	Model Performance Analytics	Accuracy metrics display
		Confusion matrix visualization
		Model comparison features
FR-7	User Dashboard & Profile Management	Personal dashboard
		Upload history
		Profile settings
		Usage statistics

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Intuitive user interface with minimal learning curve. Support for medical professionals and researchers. Responsive design for desktop and mobile devices.
NFR-2	Security	Secure user authentication and authorization. HIPAA-compliant data handling for medical images. Encrypted data transmission (HTTPS). Secure file storage with access controls.
NFR-3	Reliability	System uptime of 99.5% or higher. Robust error handling and recovery mechanisms. Data backup and disaster recovery procedures.
NFR-4	Performance	Image classification response time < 5 seconds for single images. Support for batch processing of up to 100 images. Model inference time < 2 seconds per image.
NFR-5	Availability	24/7 system availab