Technology Stack

Project Name: HematoVision – Blood Cell Classification
Team ID: LTVIP2026TMIDS47037
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1. Frontend Technologies

Technology	Purpose	Details
React.js	User Interface	Build interactive and responsive web pages for uploading blood samples and viewing reports.
HTML5 / CSS3	Structure & Styling	Design the structure and style of web pages.
JavaScript	Interactivity	Handle dynamic elements, validations, and user interactions.
Bootstrap / Tailwind CSS	UI Components	Use ready-made UI components for faster development.

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2. Backend Technologies

Technology	Purpose	Details
Node.js	Server-side Scripting	Run backend services and handle API requests efficiently.
Express.js	Web Framework	Build RESTful APIs for communication between frontend and backend.
Python	AI & ML Model	Develop blood cell classification models using libraries like TensorFlow or PyTorch.
Flask / FastAPI	API for ML	Serve AI model predictions to the frontend via REST APIs.

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3. Database Technologies

Technology	Purpose	Details
MongoDB Atlas	NoSQL Database	Store patient data, uploaded blood sample images, and classification results.
Mongoose	ODM (Object Data Modeling)	Simplify MongoDB queries with schema validation.

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4. Cloud & Hosting

Technology	Purpose	Details
AWS / Heroku	Hosting	Deploy the web application and backend services on the cloud.
AWS S3 / Cloud Storage	Image Storage	Store uploaded blood sample images securely.

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5. AI / Machine Learning Stack

Technology	Purpose	Details
TensorFlow / PyTorch	Model Development	Build deep learning models for blood cell classification.
OpenCV	Image Processing	Preprocess blood smear images for model input.
Scikit-learn	Evaluation & Metrics	Evaluate model performance with classification metrics.

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6. Tools & IDEs

Tool	Purpose
VS Code / PyCharm	Code development and debugging.
Postman	Test REST APIs.
Git / GitHub	Version control and project repository management.
Draw.io / Lucidchart	Create diagrams like DFDs, flowcharts, and UI mockups.