

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date: 15 June 2025

Team ID: LTVIP2025TMID34516

Project Name: Pattern Scene - Classifying Fabric Patterns Using Deep Learning

Maximum Marks: 4 Marks

Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Upload images, view predictions	HTML, CSS, JavaScript, React.js
2	Application Logic-1	Pattern classification pipeline	Python (Flask / FastAPI)
3	Application Logic-2	Preprocessing (resize, normalize)	OpenCV, NumPy
4	Application Logic-3	Logging & feedback handling	Python Logging, SQLite
5	Database	Store user data, image metadata	MongoDB
6	Cloud Database	Image classification logs & audit	Firebase Firestore / AWS DynamoDB
7	File Storage	Store uploaded images	AWS S3 / Google Cloud Storage
8	External API-1	Fabric pattern taxonomy from fashion datasets	Fashionpedia API
9	External API-2	AI model monitoring service	Hugging Face API
10	Machine Learning Model	Fabric pattern classifier (CNN-based)	TensorFlow / PyTorch
11	Infrastructure	Cloud deployment environment	AWS EC2 / Google Cloud Run / Kubernetes

Table-2: Application Characteristics

S.No	Characteristic	Description	Technology
1	Open-Source Frameworks	Used for model, backend, and UI	TensorFlow, PyTorch, React.js
2	Security Implementations	Authentication, HTTPS, file validation	JWT, OAuth 2.0, HTTPS, SHA-256
3	Scalable Architecture	Microservices for model, upload, storage, prediction	Docker, Kubernetes, REST APIs

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4	Availability	Cloud-hosted, load balancing	AWS Load Balancer / Google Cloud LB
5	Performance	Optimized model inference, caching, CDN for assets	Redis, Cloudflare CDN