

Full Stack Development Project Documentation

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

Date: 15 June 2025

Team ID: LTVIP2025TMID34516

1. Introduction

Team Members:

- Dev A - Frontend & React Integration
- Dev B - Backend (Flask API / Node fallback)
- Dev C - AI/ML Model Development
- Dev D - DevOps & Cloud Deployment

2. Project Overview

Purpose: Automate and standardize fabric pattern classification using a CNN-based deep learning model.

Features:

- Upload fabric images
- Get pattern classification (floral, plaid, striped, etc.)
- Feedback module
- Admin dashboard
- API for integration

3. Architecture

Frontend: React.js app with image upload UI, result display, and feedback form

Backend: Python (Flask FastAPI), or Node.js with Express as fallback

Database: MongoDB (image metadata, classification logs)

4. Setup Instructions

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Prerequisites: Node.js, Python 3.9+, MongoDB, pip, virtualenv

Installation:

```
git clone [repo]
```

```
cd client && npm install
```

```
cd ../server && pip install -r requirements.txt
```

5. Folder Structure

Client:

```
/components, /views, /services, /App.js
```

Server:

```
/routes, /controllers, /model, /ml, /main.py
```

6. Running the Application

Frontend:

```
cd client && npm start
```

Backend:

```
cd server && python main.py
```

7. API Documentation

POST /upload - Upload image

GET /classify - Classify existing uploaded image

POST /feedback - Send user feedback

Example response:

```
{ "pattern": "striped", "confidence": 0.93 }
```

8. Authentication

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JWT-based authentication for users and admins

OAuth (Google) planned for future

9. User Interface

Image upload page

Real-time prediction output

Admin dashboard with metrics

Feedback panel

10. Testing

Pytest (backend)

React Testing Library (frontend)

Postman (API)

11. Screenshots or Demo

Will include images or links to deployed app/demo (optional placeholder)

12. Known Issues

Poor results on low-res or blurred images

Feedback retraining module under development

13. Future Enhancements

Batch classification

Mobile-native app

Visual heatmap overlays

Multilingual UI