Smart Internz Project Documentation

# 📌 Project Details

Project Title: Classifying Fabric Patterns using Deep Learning

Program: Artificial Intelligence and Machine Learning

Team ID: LTVIP2025TMID37334

Team Size: 5 Members

# 👥 Team Members

Team Leader: Vatti Pavitra

Team Member: Yagati Vinod Kumar

Team Member: Yajjala Rajasekhar

Team Member: Masa Arjun

Team Member: Mantha Mani Krishna Rahul

# 📌 Project Overview

The project focuses on the classification of various fabric patterns using deep learning techniques. It aims to automate the identification process of fabric types based on their patterns, which is especially useful for textile industries. The system leverages Convolutional Neural Networks (CNNs) to achieve high accuracy in recognizing patterns.

# 🔧 Technologies Used

- Python

- TensorFlow / Keras

- OpenCV / PIL for image preprocessing

- Deep Learning (CNNs)

- Google Colab / Jupyter Notebook

# 🎯 Features

- Automated image classification for fabric patterns

- Image preprocessing and augmentation

- Model training and evaluation with accuracy metrics

- Real-time prediction from user-uploaded fabric images

# 🚀 Workflow

1. Collect and label dataset of fabric pattern images

2. Preprocess the images (resize, normalize, augment)

3. Build and train a CNN model on the dataset

4. Evaluate model performance and accuracy

5. Deploy the model for real-time image classification

# 📋 Requirements

- Python 3.8+

- TensorFlow or Keras

- Jupyter Notebook / Google Colab

- Labeled image dataset of fabric patterns

# ▶️ How to Run

1. Load the dataset and import libraries

2. Preprocess the dataset and split into train/test sets

3. Define and compile the CNN model

4. Train and evaluate the model

5. Use the trained model to classify new images

# 🏁 Conclusion

The fabric pattern classification system provides an efficient way to automate and enhance quality control in the textile industry. It reduces manual inspection and improves the speed and accuracy of pattern recognition using deep learning.