# Machine Learning Project Documentation

## 1.Introduction

• Project Title: Pattern sense:Classifying Fabric Patterns Using Deep Learning

• **Team Leader :** M Anjali Bhushan

**Team member :** Bhaskaruni Yojana Mani

**Team member :** Balusu Vignesh

**Team member :** Andugula Chandu

| **Step** | **Assigned To** | **Notes** |
| --- | --- | --- |
| 1. Importing the libraries | Andugula Chandu | Basic setup and dependency management. |
| 2. Configure ImageDataGenerator | Andugula Chandu | Preprocessing pipeline setup. |
| 3. Apply ImageDataGenerator | Andugula Chandu and  M Anjali Bhushan | Data flow preparation for training, validation, test. |
| 4. Model building | Bhaskaruni Yojana Mani | Building and compiling the deep learning model. |
| 5. Evaluating the model | Balusu Vignesh | Shared to ensure robustness and review. |
| 6. Application building | Balusu Vignesh | Deploying and integrating UI or application layer. |

• Objective: Automate the classification of fabric patterns to assist textile industries in quality control and production planning.

## 2. Problem Statement

Manual classification of fabric patterns is time-consuming and error-prone; automating it improves efficiency and consistency.

## 3.Related Work

Mention existing methods or papers that tried similar approaches. Discuss their limitations and why your approach is different or improved.

## 4.Dataset Details

Describe the source of your dataset. Mention data size, types of fabric patterns included, and any preprocessing steps performed.

## 5.Methodology

• Architecture: Describe the model architecture (e.g., CNN, ResNet, etc.).

• Data Preprocessing: Steps like resizing, augmentation, normalization.

• Training Process: Details about epochs, batch size, loss function, optimizer.

• Evaluation Metrics: Accuracy, precision, recall, F1-score, confusion matrix.

## 6.Experimental Results

Include graphs, tables, and confusion matrix. Provide example classification results (correct and misclassified images).

## 7.Advantages & Disadvantages

Advantages:

• Fast and automated classification.

• Reduces human error.

• Supports large-scale production.

Disadvantages:

• Accuracy limited by dataset quality.

• Difficulties with rare or traditional patterns.

• High computational requirements.

## 8.Conclusion

Summarize the achievements and key findings from your project.

## 9. Future Scope

• Expand dataset to include more traditional and diverse patterns.

• Improve model explainability (e.g., Grad-CAM visualization).

• Deploy on edge devices for real-time classification.

• Integrate with factory automation systems.