



**MANIPAL INSTITUTE OF TECHNOLOGY**

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**Synopsis Report**

**On**

**PATTERN RECOGNITION FOR PRINTED  
MATERIAL**

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## Introduction:

- The problem statement involves being able to detect and categorize the printed patterns found on a piece of cloth or paper, based on the pattern set that is available beforehand
- The challenges would involve detecting the points/regions of interest that would help us discern, differentiate and identify the pattern from the ones available in the dataset
- The applications include categorizing and sorting of the printed materials from a collection of a many items. Despite this, it could also be used to categorize animals based on their patterns(example application that isn't implemented here).

## Objectives

- The primary objective is to detect and categorize(by means of naming) the patterns that have been fed to the program, by means of comparison with an on-hand dataset that serves as a reference of all the possibilities
- The patterns are detected using various methods, based on the type of pattern, i.e., patterns with curves, patterns with straight edges, coloured patterns, patterns with discernible points, etc.

## Methodology

- The dataset includes a collection of all the patterns that are known, along with their corresponding name/category. It must be contained in a folder that allows us to add more pattern samples if needed. The samples must have been recorded under ideal conditions(parallel lighting, high resolution, minimum noise, etc.)
- The primary method would be the detection of the important factors that define the shape of the pattern. The first level would include a basic histogram comparison, which would allow us to detect abstract patterns, as well as coloured patterns. Then, it would move on to either curve, edge, or point detection and comparison with the same features extracted from the samples
- The outcome expected identifies the pattern and names it based on the tags in the dataset

## References

-Zhang, J., Yao, P., Wu, H. et al. Automatic color pattern recognition of multispectral printed fabric images. J Intell Manuf (2022). <https://doi.org/10.1007/s10845-022-01947-8>

-Jiaping Li, Wendi Wang, Na Deng, Binjie Xin. A novel digital method for weave pattern recognition based on photometric differential analysis. Measurement, Volume 152 (2020) <https://doi.org/10.1016/j.measurement.2019.107336>

### Details of Group Members

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