ACROPOLIS INSTITUTE OF TECHNOLOGY AND RESEARCH

**Department of CSE (DS)**

# Synopsis

On

***Fashion Lens***

## Introduction

* 1. Overview

The growing demand for online shopping has increased the need for efficient product categorization, especially in the clothing industry. Manual tagging of products is time-consuming and prone to errors, making automated classification essential. This project develops an E-commerce Clothing Classifier Model using Keras, leveraging deep learning to classify clothing images into predefined categories. Convolutional Neural Networks (CNNs) enhance searchability, inventory management, and recommendations for e-commerce platforms.

* 1. Purpose

This project aims to provide an automated solution for classifying clothing items accurately, reducing manual effort, improving tagging precision, and enhancing customer experience through personalized recommendations.

The key purposes of this project include:

* Efficiency in Inventory Management: Automating the classification of clothing items streamlines inventory management for e-commerce platforms, ensuring quick and accurate product tagging.
* Improved Search and Filtering: Well-classified clothing products enhance search relevance, allowing customers to find desired items more efficiently.
* Enhanced Recommendation Systems: The model enables personalized product recommendations by accurately categorizing products based on their features and similarities.
* Scalability for Large Datasets: The deep learning model can process and classify thousands of clothing images efficiently, making it suitable for large-scale e-commerce businesses.
* Reduction in Human Error: By eliminating manual tagging, the system ensures consistent product classification, reducing errors and inconsistencies across different listings.
* Support for Visual Search & AR Applications: The model provides a foundation for visual search tools and augmented reality-based try-on applications, enhancing the customer shopping experience.

## Literature Survey

* 1. Existing Problem

E-commerce platforms typically rely on manual tagging, keyword-based searches, or traditional machine learning techniques for product categorization. These methods have several limitations:

* Human Error & Subjectivity: Manual categorization is prone to errors and inconsistencies.
* Scalability Issues: As product catalogs grow, maintaining accurate tags manually becomes inefficient.
* Inconsistent Descriptions: Different sellers may use varied terminologies, leading to difficulties in standardization.
* Limited Accuracy in Existing Models: Traditional machine learning approaches often struggle with complex visual patterns, leading to misclassifications.
  1. Proposed Solution

The proposed solution is a CNN-based deep learning model trained on a dataset of labeled clothing images. It will:

* Automate Classification: The model learns clothing features and assigns accurate labels, reducing dependency on manual tagging.
* Improve Accuracy: Unlike keyword-based methods, CNNs can analyze intricate design patterns and classify items based on visual content.
* Enhance User Experience: Efficient classification improves search relevance and recommendation systems.
* Ensure Scalability: The model can process thousands of images efficiently, making it suitable for large-scale e-commerce platforms.

## Theoretical Analysis

* 1. Block Diagram
  2. Hardware/Software Designing

Software Requirements:

* Python (programming language)
* TensorFlow/Keras (deep learning framework)
* OpenCV (image processing)
* NumPy, Pandas, Matplotlib (data analysis & visualization)
* Jupyter Notebook/Google Colab (development environment)

Hardware Requirements:

* GPU-enabled system (for efficient model training)
* 8GB RAM (minimum)
* Adequate storage for dataset processing

## Applications

* E-commerce Platforms – Automates product categorization, reducing manual workload and improving search functionality by providing accurate recommendations.
* Retail Inventory Management – Helps businesses maintain structured and searchable inventories, streamlining operations.
* Fashion Analytics – Provides valuable insights into customer preferences, enabling retailers to tailor marketing strategies and optimize stock management.
* Augmented Reality (AR) Virtual Try-Ons – Supports AR applications where users can visualize clothing items in real-time before making a purchase.
* Automated Visual Search – Enhances shopping experiences by allowing users to upload images and find similar clothing items through image-based search engines.
* Fraud Detection in E-commerce – Helps detect duplicate listings or counterfeit products by comparing images to existing catalogs.

## REFERENCES

* https://keras.io
* https://www.tensorflow.org/tutorials
* https://www.kaggle.com

# Guided By: Group Members:

Prof. Deepak Singh Chouhan Deepak Gupta (0827CD11020) Devraj Dangi (0827CD11022) Himanshu Sopra (0827CD11028) Ishita Pareta (0827CD11030)