Skincare Recommender System - Project Proposal

Project Proposal

The primary goal of this project is to build an end-to-end Skincare Recommender System that uses deep learning techniques to detect facial skin types and skin issues (like acne, scars, redness, etc.) from an uploaded face image and recommends appropriate skincare products.

Problem Statement:
Skincare is highly personalized. A product that works well for oily skin may worsen the condition for someone with dry or sensitive skin. Many users struggle to identify their skin type and choose appropriate products. This project aims to bridge that gap using AI.

Approach Overview:
1. Image Input: User uploads a selfie or facial image via a web interface.
2. Skin Analysis Model: A deep learning model detects skin type (e.g., oily, dry, normal, etc.) and identifies visible skin issues.
3. Recommendation Model: Based on the detected skin type and issues, relevant skincare products are recommended using product datasets.
4. Web Interface: A user-friendly interface shows detection results and tailored recommendations.

Data Selection

Datasets Used:

1. Skin Type Detection & Skin Issue Identification:
- Oily, Dry, Normal Skin Types Dataset (Kaggle)
- Face Scar Dataset (Kaggle)
- Skin Defects - Acne, Redness, Bags (Kaggle)
- Skin Disease Classification (Kaggle)

2. Product Recommendation:
- Skincare Recommender System Dataset (GitHub)

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- Amazon Skincare Products Dataset (Kaggle)

Justification:

These datasets are well-suited as they collectively provide:

- Rich image data with labels for both skin types and skin conditions.
- Comprehensive product listings suitable for training a recommendation engine.

Data Description

Dataset	Type	Size	Attributes	Format	Challenges
Oily/Dry/Normal Skin Types	Image	~2,500 images	Skin type labels	JPG/PNG	Low-resolution, class imbalance
Face Scar Dataset	Image	~800 images	Scar regions	JPG	Limited variation
Acne/Redness Dataset	Image	~1,000 images	Acne, redness, under-eye bags	JPG	Annotation quality
Skin Disease Dataset	Image	~6,000 images	Disease class labels	JPG	Complex labeling
Skincare Recommender (GitHub)	Tabular	~300 products	Skin type, concerns, product name	CSV	Small size
Amazon Skincare Products	Tabular	~2,000 products	Product info, ingredients, tags	CSV	Data cleaning needed

Preprocessing Steps:

- Images: Resize, normalize, and augment underrepresented classes. Annotate if necessary.
- Tabular: Clean descriptions, map product suitability, and encode categorical fields.