Makeup & Cosmetic Products Recommendation System

This project focuses on developing a makeup and cosmetic product recommendation system that uses computer vision to detect various skin imperfections and recommends suitable products to address them.

by Kasmya Bhatia

The Concept

1 Skin Imperfection Detection

The core idea is to utilize computer vision techniques to analyze a user's skin condition from images identifying common skin issues such as: dark circles, pores, hyperpigmentation/ dark spots, scars, acne, redness, wrinkles/ fine lines, dryness, blackheads, whiteheads, dark lips, hooded eyes.

2 Product Recommendation

Once the skin conditions are identified, an ML-based recommendation system matches the detected imperfections with suitable cosmetic products. For example, if the system detects dark circles under the eyes, it may suggest a high-coverage concealer with brightening properties.

3 Personalized Makeup Recommendations

Personalized makeup recommendations for users who want to highlight or accentuate their natural beauty, beyond just addressing imperfections. This can appeal to users looking for ways to make the most of their unique features and feel more confident in their appearance.

Personalized Makeup Recommendations

Fuller Lips

Recommendations: Lip plumping glosses, lip liners, and volumizing lipsticks.

High Cheekbones

Recommendations: Highlighter, blush, and contouring techniques to accentuate cheekbones.

Sharper Jawline

Recommendations: Contouring techniques to define the jawline and create a more sculpted look.

Personalized Makeup Recommendations (cont.)

Fuller Brows

Recommendations: Brow pencils, brow powders, and brow gels to fill in and shape brows.

Defined Nose/Contoured

Recommendations: Contouring techniques to enhance the nose shape and create a more defined look.

Larger Eyes

Recommendations: Eyeliner, eyeshadow, and false lashes to create the illusion of larger eyes.

Personalized Makeup Recommendations (cont.)

Longer Lashes

Recommendations: Mascara, lash extensions, and lash serums to lengthen and volumize lashes.

Sharper Eyes

Recommendations: Eyeliner, eyeshadow, and contouring techniques to create a more defined eye shape.

Glowing/Dewy Skin

Recommendations: Highlighter, illuminating primers, and dewy foundations to create a radiant complexion.

Personalized Makeup Recommendations (cont.)

More Symmetrical Face

Recommendations: Balancing Contour: Contour to enhance symmetry by slightly adjusting proportions of the face, such as softening the jaw or highlighting the chin. Corrective Makeup: Use concealer and foundation to even out any slight asymmetries in the skin tone or facial features.

System Flow

1

Step 1: Image Upload

The first step of the system involves detecting specific skin conditions from an uploaded image.

2

Step 2: Skin Condition Detection

By utilizing a large dataset of labeled images showing various skin conditions, the system can be trained to accurately classify these imperfections across different skin types, tones, and lighting conditions.

3

Step 3: Product Recommendation

Once the skin conditions are detected, the system moves to the recommendation phase. Here, an ML-based algorithm analyzes the skin issues and matches them with appropriate makeup products. For example:

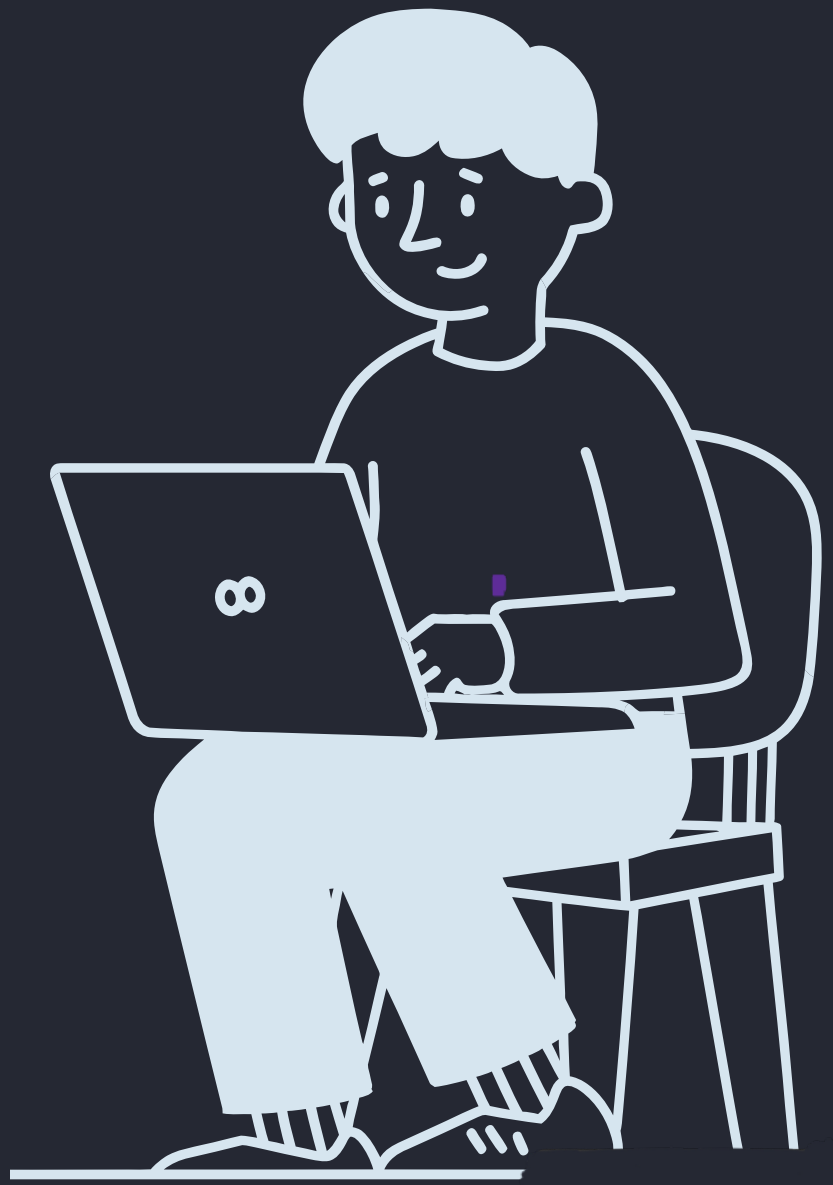
4

Step 4: Recommendation Algorithm

The system uses a recommendation algorithm that matches skin conditions with specific product features. This includes product types (e.g., foundation, concealer), ingredients (e.g., salicylic acid for acne), and user preferences (e.g., budget, preferred brands).

Examples of Existing Models

Model	Link
Haut.ai	https://haut.ai/
Makeupar.com	https://www.makeupar.com/business/products/ai-product-recommendation
SmartSkinAdvisor	https://smartskinadvisor.dermafique.com/analysis/?gad_source=1&gclid=Cj0KCQjwsJO4BhDoARIsADDv4vAk0IoxbR_KM56jzZWqWHBzHq9NcB5t2QpWGpQWeVa0CGy55jy9OPgaAlx8EALw_wcB



Conclusion

This project proposes a comprehensive approach to developing a makeup and cosmetic product recommendation system that leverages computer vision and machine learning. By analyzing skin conditions and user preferences, the system aims to provide personalized recommendations that enhance beauty and confidence. The integration of advanced technologies like computer vision and ML algorithms has the potential to revolutionize the way individuals approach makeup and skincare, offering a tailored and efficient solution for achieving desired beauty outcomes.