INTELLIGENT MAKEUP AND HAIRSTYLE SUGGESTION THROUGH IMAGE ANALYSIS

[1]Dr. M. Ratna Raju,[2]Donda Yogasree,[3]Godavarthi Siva Kalyan,[4]Godavarthi Hema Krishna Priya

[1]Professor, Dept of Computer Science and Engineering, St. Ann's College of Engineering and Technology, Chirala-523187, India.

[2,3,4]B. Tech Student, Dept of Computer Science and Engineering, St. Ann's College of Engineering and Technology, Chirala-523187, India.

ABSTRACT

Artificial Intelligence and Computer Vision have significantly influenced modern beauty technology by enabling machines to analyze human facial features and provide personalized aesthetic enhancements. This project presents an Intelligent Makeup and Hairstyle Suggestion System that uses image analysis to detect face structure, skin tone, facial features, and hair attributes to recommend suitable makeup styles and hairstyles. The proposed system applies deep learning, face detection models, and image-processing techniques to generate accurate, user-specific beauty recommendations. This system aims to enhance user experience by reducing manual trial-and-error, improving accuracy, and providing real-time visualization.

Keywords: Computer Vision, Deep Learning, Face Detection, Makeup Recommendation, Hairstyle Analysis, Machine Learning.

INTRODUCTION

In today's digital era, personalization has become a crucial aspect of beauty and fashion industries. Choosing a suitable hairstyle or makeup style is often challenging, especially without professional guidance. Traditional transformation methods require expert consultation or manual experimentation, which can be time-consuming and costly. An Intelligent Makeup and Hairstyle Suggestion System analyzes the user's facial features through image processing and suggests the most suitable styles. The system automatically detects facial geometry, skin tone, hair texture, and face symmetry to recommend appropriate makeup shades,

contouring techniques, lipstick tones, and hairstyles that fit face shape categories such as oval, round, heart, square, or diamond. This system benefits users in beauty salons, virtual makeover platforms, cosmetic applications, and fashion industries by delivering personalized, accurate, and efficient beauty enhancement solutions.

LITERATURE SURVEY

Recent advancements in AI and computer vision have enabled facial recognition and beautification technologies. Later, deep learning models such as CNNs improved accuracy in identifying facial structures. Studies on beauty recommendation systems revealed that facial geometry plays a significant role in selecting suitable hairstyles, while skin tone estimation supports personalized makeup shade selection. Research also shows attention-based neural networks achieving enhanced beauty analysis accuracy and real-time virtual try-on systems improving user engagement.

RELATED WORK

With advancements in technology, researchers introduced facial landmark detection techniques to more accurately analyze eyes, lips, nose, and jawline features. Further work was conducted on face shape classification and skin tone identification to support personalized beauty recommendations. Makeup transfer and virtual beautification techniques using deep learning enabled virtual application of cosmetics on facial images. Similarly, hairstyle recommendation systems examined facial geometry to predict suitable hairstyles for different face types. Augmented Reality-based virtual try-on technologies also emerged, allowing users to preview makeup.

EXISTING SYSTEM

In existing beauty enhancement and makeover systems, most applications primarily focus on applying simple filters or predefined makeup effects without understanding individual facial characteristics. Traditional approaches rely on manual selection of hairstyles and makeup by users or professional beauticians, which is time-consuming and subjective. Many current tools only perform basic face

detection and beautification, such as smoothing skin, changing lip color, or adding simple effects, without analyzing face shape or skin tone. Some existing systems provide virtual makeup try-on, but they lack intelligent personalization and do not recommend suitable styles automatically.

PROPOSED SYSTEM

The system captures a facial image and performs face detection followed by facial landmark extraction to analyze key features such as eyes, lips, nose, jawline, and cheeks. It then classifies the user's face shape (oval, round, square, heart, or long) and estimates skin tone using image processing and machine learning techniques. Based on these extracted attributes, the system intelligently recommends suitable makeup styles including foundation shade, eye makeup, lipstick color, and blush tone. Similarly, it suggests appropriate hairstyles tailored to the user's face structure and appearance.

SYSTEM ARCHITECTURE

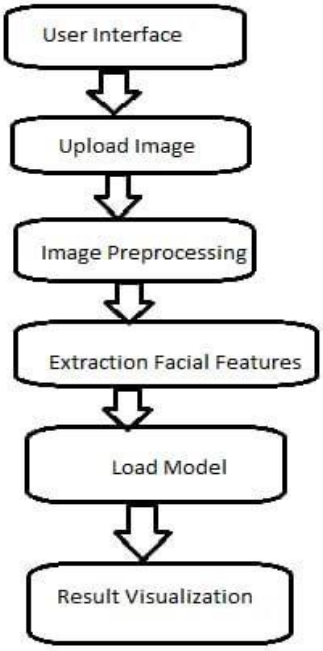

Fig 1: Architecture of Hairstyle and Makeup

METHODOLOGY DESCRIPTION

Image Acquisition

Users upload a selfie or live camera capture.

Preprocessing

Noise removal, image resizing, normalization.

Face & Feature Detection

Using CNN-based models to detect eyes, lips, jawline, forehead, cheeks.

Skin Tone Detection

Histogram-based color detection and RGB/HSV analysis.

Face Shape Analysis

Measured ratios classify face shape (oval, round, square, heart, diamond).

RESULTS AND DISCUSSION

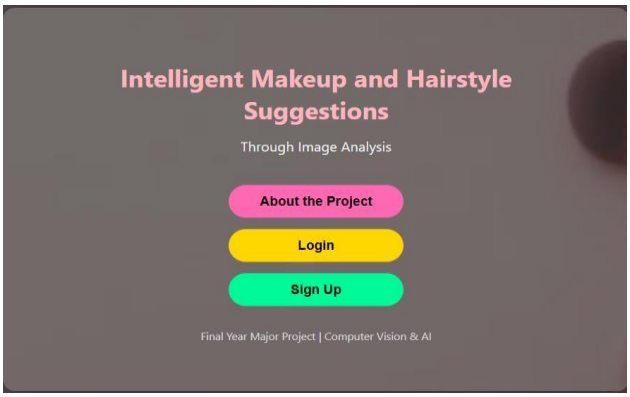

Fig 2: webpage

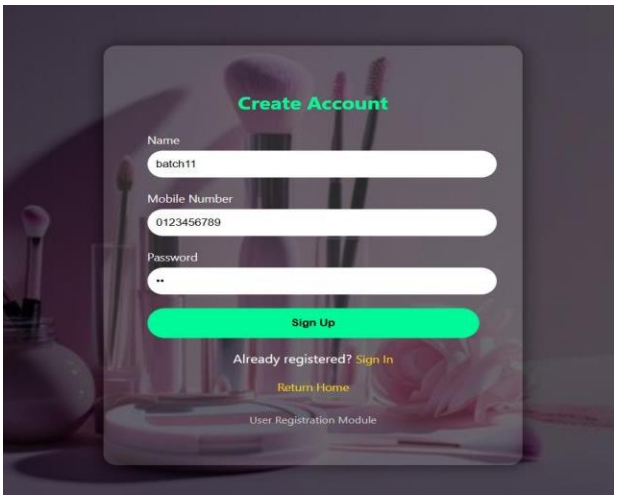

Fig 3: SignUp Page

This Figure shows that signup of the project of user account.

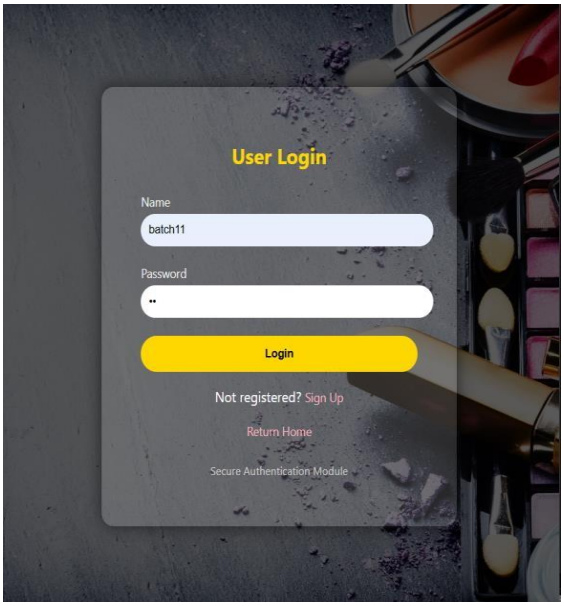

Fig 4: Login Page

The user can log in using username and password. Only authenticated users are allowed to access the system.

Fig 5: Upload images Page

The user uploads their face image on this page. The system processes the uploaded image for analysis**.**

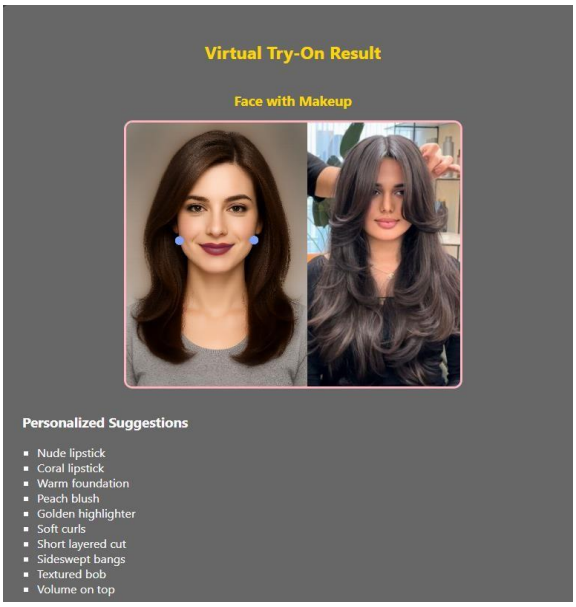

Fig.6 Result Page

This page displays the suggested makeup and hairstyle based on the user's face analysis. It shows final recommendations clearly to the user.

CONCLUSION

The Intelligent Makeup and Hairstyle Suggestion System successfully integrates Artificial Intelligence, Computer Vision, and Deep Learning to deliver personalized beauty recommendations based on facial analysis. Overall, the project contributes to modern beauty technology by enabling intelligent, automated, and personalized aesthetic enhancement.

FUTURE SCOPE

Cloud-based deployment can be introduced to support large-scale processing, remote access, and faster performance. The system can also be extended to support gender-based, age-based, and culture-specific styling recommendations to provide more inclusive results.

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