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An AI-Based Hair care Recommendation System

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ABSTRACT

This project shows an AI-based hair care recommendation system that gives personalised home remedies based on how your hair is doing. The system takes in information from users about their hair type, scalp condition, hair problems (like dryness, hair fall, and dandruff), and lifestyle factors. The system looks at the data and suggests natural remedies that use things like aloe Vera, coconut oil, neem, and curd. It does this by using machine learning or rule-based logic. The goal is to encourage hair care products that are safe, don't contain chemicals, and are affordable. This system helps people keep their hair healthy by using home remedies that are easy to find. Hair problems such as hair fall, dandruff, dryness, and scalp infections are very common due to pollution, stress, and improper lifestyle. Many people use chemical-based products which may cause side effects. This project, KeshCare, is an AI-based system that provides personalized hair care solutions using natural home remedies. The system analyses user inputs like hair type, scalp condition, and problems, and suggests safe and effective remedies using natural ingredients. The goal is to promote healthy hair care in an affordable and eco-friendly way.

1. INTRODUCTION

Healthy hair is important when it comes to ensuring overall personal well-being and good looks. The cases of common hair conditions like hair fall, dandruff, dryness, and infections of the scalp have risen over the last few years due to reasons like environmental pollution, unhealthy lifestyle habits, stressful environments, and improper hair care techniques. Traditional methods have focused on the use of chemical-infused products that offer temporary relief while leaving harmful side effects like scalp irritations and hair damage and making users dependent on such artificial compounds.

As people are more aware about sustainability and living a natural life, they are gradually shifting towards using natural and herbal solutions in hair care processes. Ingredients like aloe vera, coconut oil, neem, and curd are examples of herbal compounds that have been in use for ages because of the effectiveness of these compounds without having side effects on the user. But choosing from different solutions for different types of hair, scalp conditions, and other hair problems depends on the particular individual's requirements. With technological advances in fields of Artificial Intelligence (AI) and Machine Learning (ML), intelligent recommendation systems have emerged as powerful platforms that can give personalized recommendations based on user input.

2. Literature Review

Many researchers have worked on improving hair care systems by using different methods and technologies.

Hair Fall Forecasting Using AI Framework (2025)
AI model: Temporal Fusion Transformer; application: forecasting hair fall trends; application area: prediction of hair condition.

Machine Learning Hair and Skin Analysis (2024)
AI algorithms: machine learning; analysis: hair condition and skin condition; provides more personalized analysis.

AI-Based Hair Loss Prediction System (2024)
Predicts hair loss using AI techniques; data inputs include genetic data and health data; provides early detection of hair-related issues.

Deep Learning for Measuring Hair Density (2022)
AI model: deep neural networks; analysis: measurement of hair density based on scalp images.

AI-Based Hairstyle Recommendation System (2019)
Hair style recommendation using AI; techniques include face recognition and deep learning.

TABLE 1: COMPARATIVE STUDY OF AI-BASED HAIRCARE SYSTEMS

Research / Year	AI method / Input	Gap relative to KeshCare
AI Framework for Hair Fall Forecasting (2025)	Temporal Fusion Transformer	Focuses on prediction, not natural remedy recommendation.
Machine Learning Hair & Skin Analysis (2024)	Machine learning; hair/skin data	Does not focus on home-remedy treatment.
AI Based Hair Loss Prediction (2024)	AI + genetic/health data	Prediction rather than personalized remedy selection.
Deep Learning Hair Density (2022)	Deep neural networks + scalp images	Image-based measurement; no remedy personalization.
AI Hairstyle Recommendation (2019)	Face recognition + deep learning	Concern is style selection, not hair/scalp health.
Proposed KeshCare	User profile + hair/scalp condition + lifestyle; rules/ML	Future ML and mobile implementation remain to be developed.

3. Research Gap

No Personalized Treatment Using Natural Remedies: The majority of research studies concentrate more on prediction (of hair loss, density, etc.) than on personalized advice on hair remedy treatments. Only a few systems offer personal natural hair remedy treatment recommendations depending on hair conditions. Limited Application: AI models in most cases are still only for experimental purposes and not applied widely enough in practice. Absence of Combined Data Analysis: Most currently used systems rely on single-type input data (images or questionnaires).

4. Methodology

The system starts by gathering basic information from the user, including hair type, scalp condition, hair problems, and daily habits. Once the information is collected, the next step is data cleaning and organization into a format suitable for processing. The system analyses the data to identify the main hair issues such as hair fall, dryness, dandruff, or scalp infections. It applies predefined rules or machine learning to select remedies that fit the detected condition. It generates recommendations by selecting and ranking suitable remedies and personalizing frequency and ingredient combinations. The final result provides remedy details, ingredients, application method, and warnings. After the user tries the remedies, feedback is collected so future recommendations can be improved

5. Hardware and Software Requirements

A. Hardware Requirements

Smartphone or camera setup: used to capture pictures of hair and scalp. Laptop: used for software development, processing and image analysis. Server or cloud storage: used to store user data and potentially large training dataset.

B. Software Requirements

Python: for AI and machine learning model development.

Machine Learning Libraries: TensorFlow or Scikit-learn for hair analysis.

HTML, CSS, JavaScript: to build the web application interface.

Database (MySQL / Mongo DB): to store user data and product information.

OpenCV: for image processing and hair detection.

C. Development Tools

Frontend Tools: HTML, CSS, JavaScript, or React.
Backend Tools: Python or Node.js for data processing and interaction with the database.
Database: MySQL or Mongo DB.
Machine Learning Libraries: TensorFlow or Scikit-learn.
Data Processing Tools: Pandas and NumPy.
API Integration: REST APIs for frontend/backend and external services.
Development Environment: VS Code or PyCharm.
Version Control: Git and GitHub.

6. System Implementation Status

- Created a user interface.
- Basic input form made to get information about hair.
- Data Collection Module completed for hair type, scalp condition, and problems.
- Natural remedies knowledge base created with aloe vera, neem, coconut oil, etc.
- Recommendation Engine set up using rule-based logic.
- Personalization module is in progress to improve accuracy based on user needs.
- Feedback system is still in progress to improve recommendations over time.
- Future work includes a machine learning model, mobile applications, and advanced user profiles.

7. How the System Works

The system starts with collecting information about the type of hair, scalp condition, hair problem experienced by the user, and lifestyle. This information is pre-processed into a format the system can comprehend. The system then analyzes the data to determine the main concern such as dryness, hair fall, or dandruff. Using predefined guidelines or machine learning algorithms, it finds appropriate herbal treatments for the identified problem. The recommendation is personalized according to user preferences.

Results

- The system successfully provides personalized hair care suggestions.
- Remedies are natural, safe, and easy to use.
- Helps users reduce hair problems without chemicals.
- Simple and user-friendly interface.

Conclusion

Kesh Care is an effective AI-based hair care system that provides personalized recommendations using natural remedies. It is cost-effective, safe, and easy to use. This system can help users maintain healthy hair without relying on harmful chemical products. Future improvements can include mobile app development and advanced AI models.

Future Scope

- AI provides personalized hair care solutions based on hair type and scalp condition.
- Helps in early detection of hair problems like hair fall and dandruff.
- Use of smart devices like AI hairbrushes and scalp scanners.
- Enables virtual hairstyle and hair colour trials using AI + AR.
- Suggests natural and Ayurvedic remedies based on individual needs.
- Helps companies in developing better and safer hair care products.
- Can predict future hair loss and suggest preventive measures.
- Provides 24/7 guidance through AI chatbots and assistants.
- Makes hair care more efficient, accurate, and time-saving.

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