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GlowSmart
Personalized Skincare Recommendation System using AI

A project proposal by
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ABSTRACT

The difficulty in selecting suitable skincare products, owing to various skin types and conditions, is a considerable challenge for consumers. Conventional approaches frequently depend on trial and error, resulting in possible negative effects such as acne exacerbation, hyperpigmentation, or other serious skin disorders. The insufficient comprehension of the effects of environmental factors, dietary practices, and ingredient interactions intensifies these issues. This project presents an AI-driven skincare recommendation system that evaluates skin type and problems, taking into account medical allergies, lifestyle decisions, and product compositions.

Multi-agent systems consist of multiple autonomous agents interacting and collaborating to achieve complex goals. Each agent specializes in distinct tasks and independently contributes its expertise toward a shared objective. In such systems, agents communicate and coordinate their actions, enhancing efficiency, scalability, and adaptability. This decentralized approach allows for simultaneous processing of diverse information streams and problem-solving capabilities. Consequently, multi-agent systems are particularly effective for applications requiring real-time analysis, decision-making, and personalized recommendations, especially in dynamic and complex environments.

Initial testing results indicate strong model performance, with a precision of 0.84, recall of 0.83, and an F1 score of 0.835. The system also achieved an AU-ROC of 0.95 during skin condition classification tasks, highlighting its effectiveness in accurate skincare analysis and its potential to enhance personalized dermatological recommendations.

ACM CCS Subject Descriptors:

- Computing methodologies → Machine learning → Machine learning approaches → Neural networks
- Information systems → Information retrieval → Retrieval tasks and goals → Recommender systems
- Applied computing → Life and medical sciences → Consumer health → Health informatics

Keywords: Skincare recommendations, artificial intelligence (AI), convolutional neural networks (CNN), ingredient analysis, personalised dermatology.