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Skin Disease Detection Using Ensemble Learning

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Abstract: *Skin diseases affect millions of people worldwide, making early detection and accurate diagnosis crucial for effective treatment. However, the process of diagnosing skin conditions often requiresspecialized dermatological expertise, which can be time-consuming and expensive. To address this challenge, we have developed a web-based Skin Disease Detection System using cutting-edge machine learning and ensemble techniques. Our system leverages the* ***HAM10000 dataset****, consisting of 10,000 dermoscopic images representing seven common skin lesion types. We employ an ensemble learning approach, integrating* ***ResNet50, EfficientNetB0, and DenseNet121*** *as base models and combining their predictions using a* ***logistic regression meta-model****. This architecture enhances the accuracy and robustness of the predictions. The backend of our application is built with* ***Flask****, responsible for model processing, authentication, and handling APIrequests. The* ***React*** *frontend provides an intuitive user interface where users can upload skin lesion images and receive real-time predictions along with confidence scores. The system also incorporates* ***authentication and token verification*** *for secure user access, ensuring data privacy and integrity. Our project aims to provide an* ***accessible****,* ***reliable****, and* ***cost-effective tool*** *to assist* ***healthcare professionals*** *and* ***individuals*** *in the early detection of skin diseases, potentially improving patient outcomes and reducing the burden on dermatology services*

Keywords: Skin diseases