

ABSTRACT

Dermatitis Atopik and Psoriasis are two chronic skin diseases that require early detection to prevent increased symptom severity and further complications. Limited access to dermatological services in various regions of Indonesia highlights the need for a practical and informative self-screening solution. This study develops an image-based detection system using the YOLOv8 algorithm, integrated with the Large Language Model (LLM) Gemini 1.5, to automatically generate natural language explanations of symptoms. The dataset consists of 2,351 labeled images of Dermatitis Atopik and Psoriasis collected from Kaggle and Roboflow, which were expanded to 4,102 images through visual Augmentation techniques. Four training scenarios using YOLOv8s, YOLOv8m, and YOLOv8l were evaluated based on precision, recall, F1-score, and mAP. YOLOv8s with Augmentation demonstrated the best performance, achieving a precision of 0.965, recall of 0.939, F1-score of 0.962, and mAP of 0.867. The model was then converted into TensorFlow Lite format and implemented in a mobile application built with Flutter, allowing offline inference on Android devices. The system not only provides visual detection results in the form of bounding boxes and disease labels but also delivers symptom explanations that were deemed accurate and relevant by a dermatology specialist. Validation results indicate that the system can assist lay users in understanding their skin conditions independently and has strong potential as an educational and early screening tool in underserved areas.

Keywords—YOLOv8, skin disease detection, Dermatitis Atopik, Psoriasis, LLM, Flutter, self-screening, image Augmentation.