DETEKSI PENYAKIT KULIT MENULAR BERDASARKAN CITRA LESI KULIT MENGGUNAKAN ALGORITMA *VISION TRANSFORMER* BERBASIS WEBSITE

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ABSTRAK

Diagnosis penyakit kulit menular akibat virus seperti cacar monyet, cacar air, campak, cacar sapi, dan HFMD umumnya dilakukan melalui metode PCR yang memerlukan waktu lama dan fasilitas laboratorium yang memadai. Gejala awal yang serupa antar penyakit sering menyulitkan diagnosis dini, keterbatasan tenaga kesehatan serta alat diagnostik semakin memperburuk situasi, terutama di wilayah terpencil. Penelitian ini bertujuan untuk mengembangkan model deteksi otomatis berbasis algoritma *Vision Transformer* (ViT) guna mengklasifikasikan jenis penyakit kulit menular dari citra lesi kulit, serta mengintegrasikannya ke dalam sistem berbasis web. Model dilatih menggunakan arsitektur ViT-B/16 dan ViT-L/16 dengan optimizer AdamW dan RAdam. Hasil menunjukkan bahwa ViT-B/16 dengan RAdam melampaui ViT-L/16 dengan AdamW, menekankan pentingnya pemilihan optimizer. Hasil terbaik diperoleh ViT-L/16 dengan RAdam, mencapai *validation loss* 0,2729, serta akurasi 93,83%, *precision* 96,81%, *recall* 92,45%, dan *f1-score* 94,06% pada data uji. Model diintegrasikan ke dalam *website* untuk membantu pengguna melakukan deteksi yang diberikan secara *real time*.

Kata Kunci: Penyakit Kulit Menular, *Vision Transformer*, Klasifikasi Citra, *Real Time*

VIRAL SKIN DISEASE DETECTION BASED ON SKIN LESION IMAGES USING VISION TRANSFORMER ALGORITHM VIA WEB-BASED APPLICATION

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ABSTRACT

The diagnosis of viral skin diseases such as monkeypox, chickenpox, measles, cowpox, and HFMD typically relies on PCR methods that are time-consuming and require advanced laboratory facilities. Similar early symptoms across these diseases often complicate early diagnosis, while shortages of medical personnel and diagnostic tools worsens the situation, particularly in remote areas. This study aims to develop an automated detection model based on Vision Transformer (ViT) algorithm to classify viral skin diseases from skin lesion images and integrate it into a web-based system. The models were trained using ViT-B/16 and ViT-L/16 architectures with AdamW and RAdam optimizers. Results show that ViT-B/16 with RAdam outperformed ViT-L/16 with AdamW, highlighting the critical role of optimizer selection. The best performance was achieved by ViT-L/16 with RAdam, showing a validation loss of 0.2729, along with 93.83% accuracy, 96.81% precision, 92.45% recall, and 94.06% f1-score on test data. The model was integrated into a website to enable real-time detection for users.

Keywords**:** *Viral Skin Diseases, Vision Transformer, Image Classification, Real Time*