

KLASIFIKASI CACAR MONYET MENGGUNAKAN *CONVOLUTIONAL NEURAL NETWORKS* (CNN) ARSITEKTUR *PRUNED RESIDUAL NETWORK-50* (RESNET-50) PADA *FRAMEWORK* FLUTTER

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ABSTRAK

Wabah cacar monyet yang sebelumnya hanya ditemui di Afrika telah menyebar ke benua lainnya termasuk Asia. Timbul kegelisahan dari masyarakat karena penyebaran ini terjadi setelah pandemi COVID-19 dinyatakan berakhir. Cacar monyet memiliki kesamaan gejala dengan penyakit kulit lain seperti cacar sapi, cacar air, dan campak. Berbagai penelitian mengenai model klasifikasi yang menerapkan *Deep Learning* (DL) kemudian dikembangkan untuk membantu tahap deteksi dini wabah tersebut. Penelitian tersebut menghasilkan set data seperti WSI, MSID, MCSI, dan MSLD v2 yang digunakan juga pada penelitian ini. Model *pruned* ResNet-50 dipilih sebagai model utama penelitian karena reputasinya yang cukup baik meskipun hanya dengan 50 layer. Model tersebut berbasis ResNet-50 dengan modifikasi *pruning* metode Global MP dan *quantization* metode QAT. Modifikasi tersebut membuka peluang menerapkan model DL besar pada perangkat ringkas seperti *mobile* android. Nilai akurasi, *precision*, *recall*, dan *f1-score* masing-masing adalah 94.44%, 94.12%, 94.71%, dan 94.16%. Sementara itu, *pruning* dan QAT mengurangi ukuran penyimpanan model menjadi 20.993 MB. Model kemudian diimplementasikan pada perangkat android menggunakan *framework* Flutter dan telah melewati tahap pengujian *blackbox* dengan baik.

Kata Kunci: *Cacar Monyet, Convolutional Neural Networks, Deep Learning, Flutter, Pruning, Quantization, ResNet-50*

MONKEYPOX CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORKS (CNN) PRUNED RESIDUAL NETWORK-50 (RESNET-50) ARCHITECTURE ON FLUTTER FRAMEWORK

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ABSTRACT

The monkeypox outbreak, which was previously only found in Africa, has spread to other continents including Asia. There is concern from the public because this spread occurred after the COVID-19 pandemic was declared over. Monkeypox has similar symptoms to other skin diseases such as cowpox, chickenpox and measles. Various studies on classification models that apply Deep Learning (DL) were then developed to help the early detection stage of the outbreak. These studies produced datasets such as WSI, MSID, MCSI, and MSLD v2 which were also used in this study. The pruned ResNet-50 model was chosen as the main model of the study due to its good reputation even with only 50 layers. The model is based on ResNet-50 with modifications to the Global MP pruning method and the QAT quantization method. The modification opens up opportunities to apply large DL models on compact devices such as mobile android. The accuracy, precision, recall, and f1-score values are 94.44%, 94.12%, 94.71%, and 94.16%, respectively. Meanwhile, pruning and QAT reduced the storage size of the model to 20,993 MB. The model was then implemented on an android device using the Flutter framework and has passed the blackbox testing stage successfully.

Keywords: *Convolutional Neural Networks, Deep Learning, Flutter, Monkeypox, Pruning, Quantization, ResNet-50*