

**IDENTIFIKASI KULIT WAJAH BERJERAWAT MENGGUNAKAN
ALGORITMA YOLOv8 DAN VISUALISASI REKOMENDASI
PENGOBATAN PADA WEBSITE**

SKRIPSI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana
Komputer Program Studi Rekayasa Perangkat Lunak



oleh

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UNIVERSITAS PENDIDIKAN INDONESIA
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ABSTRAK

Jerawat adalah penyakit peradangan kulit yang mempengaruhi sekitar 80-85% remaja di seluruh dunia, terutama pada masa pubertas karena perubahan hormonal. Masalah kulit ini tidak hanya mempengaruhi kondisi fisiologis tetapi juga kesehatan mental dan kehidupan sosial individu. Diagnosis dini dan pemantauan yang akurat sangat penting untuk mengontrol dan mengurangi dampak jerawat. Pendekatan yang dapat dilakukan untuk menilai tingkat keparahan jerawat adalah dengan penghitungan lesi jerawat. Namun penghitungan secara manual seringkali memakan waktu dan tidak praktis, sehingga diperlukan pendekatan otomatis untuk meningkatkan akurasi diagnosis untuk mengetahui perawatan yang tepat. Pada penelitian sebelumnya ditemukan bahwa diagnosis jerawat cukup menantang karena jerawat memiliki variasi yang signifikan dalam ukuran, bentuk, dan posisi jerawat yang berdampak pada akurasi algoritma pendeteksian. Penelitian ini mengimplementasikan algoritma YOLOv8 yang mampu mendeteksi jerawat berdasarkan *bounding box* untuk menghitung lesi dan mengkategorikan tingkat keparahan jerawat untuk selanjutnya diintegrasikan ke dalam website rekomendasi pengobatan berdasarkan tingkat keparahannya. Penelitian ini menerapkan YOLOv8 dengan menerapkan teknik augmentasi *flip* dan *rotate* dan mengubah input ukuran ke 640x64. Pelatihan menggunakan rasio 80:20 dengan model *pretrained* YOLOv8m, *optimizer* AdamW, *learning rate* 0.001 dan *batch size* 16. Dengan menggunakan dataset ACNE04, hasil evaluasi model deteksi jerawat YOLOv8 menghasilkan nilai *precision* sebesar 88.4%, *recall* 85.8%, *F1 score* 87% dan *mAP50* sebesar 90%. Implementasi model pada website menghasilkan nilai *precision* sebesar 78.31% dan *recall* sebesar 55.26% dari hasil deteksi jerawat pada 21 partisipan. Hasil ini dipengaruhi oleh resolusi kamera yang baik, pencahayaan yang cukup, dan wajah yang jelas (tanpa *make up*, aksesoris, dan filter wajah).

Kata Kunci: Jerawat, Deteksi Jerawat, Pengobatan Jerawat, YOLOv8, Konfigurasi *Hyperparameter*

**IDENTIFICATION OF FACIAL SKIN ACNE USING YOLOV8
ALGORITHM AND VISUALIZATION OF TREATMENT
RECOMMENDATIONS ON WEBSITE**

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ABSTRACT

Acne is an inflammatory skin disease that affects about 80–85% of adolescents worldwide, especially during puberty due to hormonal changes. This skin problem affects not only the physiological condition but also the mental health and social life of individuals. Early diagnosis and accurate monitoring are essential to control and reduce the impact of acne. An approach that can be taken to assess the severity of acne is by counting acne lesions. However, manual counting is often time-consuming and cumbersome, so an automated approach is needed to improve the accuracy of diagnosis and determine the appropriate treatment. In previous research, it was found that acne diagnosis is quite challenging because acne has significant variations in size, shape, and position which impacts the accuracy of the detection algorithm. This research implements the YOLOv8 algorithm to detect acne based on the bounding box to calculate the lesion and categorize the severity of acne to be integrated into the treatment recommendation website based on its severity. This research applies YOLOv8 by applying flip and rotate augmentation techniques and changing the input size to 640x640. The training uses a ratio of 80:20 with a pre-trained model YOLOv8m, AdamW optimizer, learning rate 0.001, and batch size 16. Using the ACNE04 dataset, the evaluation results of the YOLOv8 acne detection model produced a precision value of 88.4%, recall of 85.8%, F1 score of 87%, and mAP50 of 90%. Implementation of the model on the website resulted in a precision value of 78.31% and a recall of 55.26% from the results of acne detection on 21 participants. These results are influenced by good camera resolution, sufficient lighting, and a clear face (without makeup, accessories, and facial filters).

Keywords: *Acne, Acne Detection, Acne Treatment, YOLOv8, Hyperparameter Configuration*

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