

IMPLEMENTASI YOLOv8 DALAM DETEKSI DINI GEJALA ANEMIA PADA REMAJA PEREMPUAN BERBASIS ANDROID

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ABSTRAK

Anemia merupakan masalah kesehatan yang rentan dialami remaja putri, namun pemeriksaan klinis invasif seringkali menimbulkan rasa takut dan kurang praktis. Penelitian ini mengembangkan aplikasi Android "Palepal" sebagai alat deteksi dini anemia secara noninvasif. Aplikasi menganalisis citra telapak tangan, konjungtiva mata, dan kuku menggunakan arsitektur *Convolutional Neural Network* (CNN) berbasis YOLOv8. Algoritma *Perceptual Hashing* (pHash) diterapkan pada tahap prapemrosesan guna mencegah kebocoran data. Keputusan diagnosis akhir dihitung menggunakan algoritma *Weighted Decision Fusion* (konjungtiva 60%, telapak tangan 20%, kuku 20%) guna menekan angka *false positive*. Sistem dilengkapi *Image Quality Assessment* (IQA) dan metode *Sequential Model Loading* untuk mencegah kebocoran memori perangkat. Hasil evaluasi menunjukkan akurasi model telapak tangan mencapai 94,92%, disusul konjungtiva 78,80%, dan kuku 72,15%. Pengujian fungsionalitas (*black box*) mencatat tingkat keberhasilan 78,57%, sedangkan *User Acceptance Test* (UAT) oleh siswi SMP dan pakar medis memperoleh skor 86,11% (Sangat Layak). Kesimpulannya, Palepal efektif menjadi alternatif *screening* awal yang praktis guna meningkatkan kesadaran remaja terhadap indikasi anemia.

Kata Kunci: Anemia, Noninvasif, Deteksi Dini, YOLOv8, Aplikasi Android

IMPLEMENTATION OF YOLOV8 FOR ANDROID-BASED EARLY DETECTION OF ANEMIA SYMPTOMS IN ADOLESCENT GIRLS

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ABSTRACT

Anemia is a prevalent health issue among adolescent girls, yet invasive clinical examinations are often feared and impractical. This study develops "Palepal", an Android application for non-invasive early anemia detection. The application analyzes images of the palm, eye conjunctiva, and fingernails using a YOLOv8-based Convolutional Neural Network (CNN). The Perceptual Hashing (pHash) algorithm is applied during preprocessing to prevent data leakage. Final diagnostic decisions utilize a Weighted Decision Fusion algorithm (conjunctiva 60%, palm 20%, fingernails 20%) to minimize false positives. The system integrates Image Quality Assessment (IQA) and Sequential Model Loading to prevent mobile device memory leaks. Evaluation results demonstrate the palm model achieved the highest accuracy at 94.92%, followed by the conjunctiva (78.80%) and fingernails (72.15%). Functionality testing (black-box) recorded a 78.57% success rate, while the User Acceptance Test (UAT) involving students and medical experts scored 86.11% (Highly Feasible). In conclusion, Palepal is an effective and practical early screening alternative to enhance adolescents' awareness of anemia indications.

Keywords: *Anemia, Non-invasive, Early Detection, YOLOv8, Android Application*