ABSTRAK

PENERAPAN ALGORITMA *SUPPORT VECTOR MACHINE, EXTREME GRADIENT BOOSTING,* DAN *CATEGORICAL BOOSTING* DALAM KLASIFIKASI *STUNTING* DI KABUPATEN LAMPUNG BARAT

Oleh

DETA SARI ASLINA

Stunting merupakan salah satu permasalahan gizi kronis pada balita yang masih menjadi perhatian dalam kesehatan masyarakat. Penelitian ini bertujuan untuk mengklasifikasikan status stunting pada balita di Kabupaten Lampung Barat menggunakan pendekatan machine learning serta membandingkan kinerja algoritma *Support Vector Machine* (SVM), *Extreme Gradient Boosting* (XGBoost), dan *Categorical Boosting* (CatBoost). Penelitian ini menggunakan data sekunder berupa data antropometri balita usia 0–60 bulan yang diperoleh dari Dinas Kesehatan Kabupaten Lampung Barat periode Juni 2024–Juni 2025. Status *stunting* diklasifikasikan ke dalam empat kelas berdasarkan indikator tinggi badan menurut usia (TB/U). Data diproses melalui tahap pembersihan, normalisasi, serta penyeimbangan kelas menggunakan *Synthetic Minority Over-sampling Technique* (SMOTE). Model dibangun dengan proses tuning *hyperparameter* dan dievaluasi menggunakan *confusion matrix* dengan metrik akurasi, precision, recall, F1-score, serta waktu komputasi. Hasil penelitian menunjukkan bahwa seluruh algoritma mampu mengklasifikasikan status *stunting* dengan akurasi di atas 98%. XGBoost menunjukkan kinerja terbaik dengan nilai akurasi, precision, recall, dan F1-score tertinggi, sementara SVM memiliki waktu komputasi yang lebih lama. CatBoost memberikan performa yang stabil dengan waktu komputasi yang relatif efisien. Hasil penelitian ini menunjukkan bahwa pendekatan *machine learning* efektif digunakan dalam klasifikasi status *stunting* berbasis data antropometri.

Kata Kunci: *Stunting,* Antropometri, *Machine Learning,* Sistem Pendukung Keputusan, Kesehatan Anak.

ABSTRACT

APPLICATION OF SUPPORT VECTOR MACHINE, EXTREME GRADIENT BOOSTING, AND CATEGORICAL BOOSTING ALGORITHMS IN STUNTING CLASSIFICATION IN WEST LAMPUNG REGENCY

By

DETA SARI ASLINA

Stunting is one of the chronic nutritional problems among children under five that remains a major concern in public health. This study aims to classify stunting status among children under five in West Lampung Regency using a machine learning approach and to compare the performance of Support Vector Machine (SVM), Extreme Gradient Boosting (XGBoost), and Categorical Boosting (CatBoost) algorithms. This study used secondary data in the form of anthropometric data of children aged 0–60 months obtained from the West Lampung District Health Office for the period of June 2024 to June 2025. Stunting status was classified into four categories based on the height-for-age (H/A) indicator. The data were processed through data cleaning, normalization, and class balancing using the Synthetic Minority Over-sampling Technique (SMOTE). The models were developed through a hyperparameter tuning process and evaluated using a confusion matrix with accuracy, precision, recall, F1-score, and computational time as performance metrics. The results show that all algorithms were able to classify stunting status with accuracy above 98%. XGBoost demonstrated the best performance with the highest accuracy, precision, recall, and F1-score values, while SVM required longer computational time. CatBoost showed stable performance with relatively efficient computational time. These findings indicate that machine learning approaches are effective for classifying stunting status based on anthropometric data.

Keywords: Child Nutrition Disorders; Anthropometry; Machine Learning; Clinical Decision Support Systems; Child Health.