

ABSTRAK

Penelitian ini bertujuan untuk membangun model klasifikasi nilai pasar pemain sepak bola ke dalam tiga kategori: Rendah, Menengah, dan Tinggi, menggunakan algoritma *Decision Tree*. Nilai pasar pemain dipengaruhi oleh banyak faktor kompleks, sehingga menyulitkan evaluasi objektif. Data penelitian bersumber dari platform FIFA (Season 2021-2022) mencakup 17.954 data pemain dengan 51 atribut. Metodologi penelitian meliputi *Exploratory Data Analysis* (EDA), *Preprocessing* (pembersihan *missing values*, transformasi fitur, dan penyeimbangan data/data balancing), serta seleksi atribut berbasis *Information Gain*. Penyeimbangan data dilakukan untuk mencegah bias mayoritas kelas. Model dilatih dan dievaluasi menggunakan *5-fold Cross-Validation* serta dioptimalkan melalui *Hyperparameter Tuning* dengan *GridSearchCV*. Hasil penelitian menunjukkan model yang dioptimalkan mencapai akurasi 93,33%, meningkat dari model *baseline* (92,67%). Analisis *Feature Importance* menemukan bahwa *Overall Rating* (51,23%), *Release Clause* (37,92%), dan *Age* (2,59%) adalah fitur paling dominan. Evaluasi menunjukkan *F1-Score* rata-rata sebesar 0,93, membuktikan bahwa algoritma *Decision Tree* efektif sebagai alat pendukung keputusan yang akurat dalam valuasi pemain sepak bola.

Kata Kunci: *Decision Tree*, Klasifikasi, Nilai Pasar, *Data Balancing*, *Hyperparameter Tuning*.

ABSTRACT

This study aims to develop a classification model for soccer player transfer values into three categories (Low, Medium, and High) using the Decision Tree algorithm. Player market value is influenced by many complex factors, making objective evaluation difficult. The dataset consists of 17,954 player records with 51 attributes from the FIFA platform (2021-2022 Season). The research methodology includes Exploratory Data Analysis (EDA), data preprocessing (handling missing values, feature transformation, and data balancing), and feature selection based on Information Gain. Data balancing was performed using Stratified Sampling to prevent class bias. The model was trained and evaluated using 5-fold Cross-Validation and optimized through Hyperparameter Tuning with GridSearchCV. The results show that the optimized model achieved an accuracy of 93.33%, improving from the baseline model (92.67%). Evaluation indicated an average Precision, Recall, and F1-Score of 0.93, proving the model's high consistency. Feature Importance analysis identified Overall Rating (51.23%) as the most dominant factor, followed by Release Clause (37.92%) and Age (2.59%). This research proves that the Decision Tree algorithm is effective as an accurate decision support tool in classifying soccer player market values.

Keywords: *Decision Tree, Classification, Transfer Value, Data Balancing, Hyperparameter Tuning.*