OPTIMASI LSTM MENGGUNAKAN MODIFIKASI ALGORITMA GENETIKA DALAM PERAMALAN CUACA DI KOTA SURABAYA

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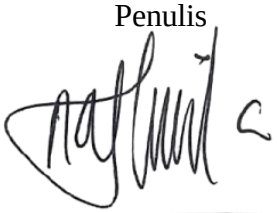

(NAFILA ROSSIANA PUTRI)

ABSTRAK

Optimasi Lstm Menggunakan Modifikasi Algoritma Genetika Dalam Peramalan Cuaca Di Kota Surabaya

Oleh :
Nafila Rossiana Putri

Perubahan cuaca yang sering terjadi dapat memberikan dampak signifikan terhadap berbagai aspek kehidupan manusia, termasuk di Kota Surabaya. Untuk mengurangi dampak negatif tersebut, diperlukan sistem prediksi cuaca yang akurat. Metode *Genetic Algorithm-Long Short-Term Memory* (GA-LSTM) diusulkan untuk meningkatkan akurasi prediksi cuaca. Penelitian ini bertujuan untuk mengimplementasikan dan mengevaluasi GA-LSTM dalam meningkatkan akurasi prediksi dibandingkan dengan metode optimasi lainnya. Model prediksi dibangun menggunakan data dari 10 parameter cuaca, dengan *Long Short-Term Memory* (LSTM) sebagai model prediksi utama dan *Genetic Algorithm* (GA) sebagai teknik optimasi *hyperparameter*. Hasil penelitian ini menunjukkan bahwa GA-LSTM mampu menghasilkan prediksi cuaca yang lebih akurat, dengan nilai *Mean Squared Error* (MSE) 4.04% lebih rendah dan *Root Mean Squared Error* (RMSE) 2.05% lebih rendah dibandingkan *Bayesian Optimization-Long Short-Term Memory* (BO-LSTM). Penerapan metode GA-LSTM menunjukkan potensi signifikan dalam meningkatkan akurasi prediksi cuaca, yang dapat membantu mitigasi dampak perubahan cuaca di Kota Surabaya.

Kata Kunci : Peramalan, Cuaca, *Long Short Term Memory¸Genetic Algorithm, Tuning Hyperparameter, GA-LSTM*

ABSTRACT

Lstm Optimization Using Modified Genetic Algorithm in Weather Forecasting in Surabaya City

Oleh :

Nafila Rossiana Putri

Frequent weather changes can have quite significant impacts on various aspects of human life, including in the city of Surabaya. To reduce these negative impacts, an accurate weather prediction system is needed. The Genetic Algorithm-Long Short-Term Memory (GA-LSTM) method is proposed to improve the accuracy of weather prediction. This ssptimization methods. The prediction model is built using data from 10 weather parameters, with Long Short-Term Memory (LSTM) as the main prediction model and Genetic Algorithm (GA) as the hyperparameter optimization technique. The results of this study indicate that GA-LSTM is able to produce more accurate weather predictions, with a Mean Squared Error (MSE) value of 4.04% lower and a Root Mean Squared Error (RMSE) of 2.05% lower than Bayesian Optimization-Long Short-Term Memory (BO-LSTM). The application of the GA-LSTM method shows significant potential in improving the accuracy of weather predictions, which can help reduce the impact of weather changes in the city of Surabaya.

Keywords: Forecasting, Weather, Long Short Term Memory¸Genetic Algorithm, Tuning Hyperparameter, GA-LSTM.

DAFTAR ISI

DAFTAR GAMBAR

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