# INTISARI

## Prediksi Jumlah Turis Masuk Bulanan, Pendekatan *Deep Learning* Dan Statistik

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Pariwisata memegang peranan penting dalam pertumbuhan ekonomi Indonesia, sehingga diperlukan peramalan kedatangan wisatawan yang akurat untuk mendukung perencanaan dan pengelolaan yang efektif. Penelitian ini mengeksplorasi dua metodologi peramalan—model statistik tradisional Autoregressive Integrated Moving Average (ARIMA) dan model pembelajaran mesin canggih Long Short-Term Memory (LSTM)—menggunakan data pariwisata bulanan dari Badan Pusat Statistik (BPS). Meskipun ARIMA berhasil menangkap pola linier sederhana dan fluktuasi musiman, model ini menghadapi tantangan dalam menangani dinamika non-linier kompleks yang melekat pada data pariwisata. Sebaliknya, LSTM unggul dalam memodelkan hubungan non-linier yang rumit, ketergantungan jangka panjang, dan pola temporal dinamis, sehingga lebih cocok untuk dataset yang kompleks. Temuan studi menunjukkan bahwa LSTM secara konsisten mencapai kinerja peramalan yang lebih baik, dibuktikan dengan kesalahan prediksi yang jauh lebih rendah dibandingkan ARIMA. Dengan detil yakni LSTM menghasilkan akurasi MAPE 19.45% sedangkan rata rata ARIMA per kota menghasilkan akurasi MAPE 55.42% jika tidak memperhitungkan MAPE yang meledak. Selain itu, dengan melakukan fine-tuning model LSTM pada dataset spesifik kota, akurasi prediksi semakin meningkat, menegaskan fleksibilitas dan efisiensi superior dari model LSTM untuk pengambilan keputusan strategis, alokasi sumber daya, dan pembangunan pariwisata berkelanjutan di Indonesia.

**Kata Kunci:** Tourism forecasting**,** ARIMA**,** LSTM**,** Time series analysis**.** Machine learning**,** Deep learning**,** Indonesia tourism**,** Prediction accuracy**,** Forecasting models, LSTM Fine tuning, AIC, MAPE.

# ABSTRACT

## Monthly Tourism Entry Rate Prediction a Deep Learning and Statistic Approach

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Tourism plays a crucial role in Indonesia's economic growth, necessitating precise forecasting of tourist arrivals to support effective planning and management. This research explores two forecasting methodologies—the traditional statistical Autoregressive Integrated Moving Average (ARIMA) model and the advanced machine learning Long Short-Term Memory (LSTM) model—-utilizing monthly tourism data from Indonesia's Badan Pusat Statistik (BPS). While ARIMA successfully captures straightforward linear patterns and seasonal fluctuations, it faces challenges when dealing with complex non-linear dynamics inherent in tourism data. In contrast, LSTM excels at modelling intricate non-linear relationships, long-term dependencies, and dynamic temporal patterns, making it more suitable for complex datasets. The study findings indicate that LSTM consistently achieves better forecasting performance, as evidenced by significantly lower prediction errors compared to ARIMA. With founding details of the LSTM model achieved a prediction accuracy with a MAPE of 19.45%, while the ARIMA model, on average, resulted in a significantly higher MAPE of 55.42% when excluding outliers. Furthermore, by fine-tuning the LSTM models to individual city-specific datasets, prediction accuracy is further enhanced, underscoring the superior flexibility and efficiency of LSTM models for strategic decision-making, resource allocation, and sustainable tourism development in Indonesia.

**Keywords:** Tourism forecasting**,** ARIMA**,** LSTM**,** Time series analysis**.** Machine learning**,** Deep learning**,** Indonesia tourism**,** Prediction accuracy**,** Forecasting models, LSTM Fine tuning, AIC, MAPE.