Tourist Arrival Forecasting in Sri Lanka Amidst the COVID-19 Pandemic: Deep Learning and Machine Learning Models

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Tourism is a crucial pillar of Sri Lanka's economy, significantly contributing to its GDP and offering numerous employment opportunities. Accurate predictions of tourist arrivals are vital for the country's tourism industry, which is susceptible to various crises. In this study, we present our research on developing deep learning and machine learning models to forecast tourist arrivals in Sri Lanka, considering the COVID-19 impact. Using historical tourist arrival data from 1972 to May 2023, we applied MinMaxScaler() for data normalisation and explored LSTM, BiLSTM, ANN, SVR, and RF models. The ANN model outperformed others, demonstrating the best forecasting results for both pre- and post-COVID-19 scenarios. The impact of COVID-19 has brought unpredictability and volatility to tourist arrivals. Our models have adapted to these changes and have shown promising results. Although the models exhibited limitations in pre-COVID-19 forecasting, comprehensive feature engineering, hyperparameter tuning, and additional data sources can enhance their performance. In conclusion, our research showcases the applicability of deep learning and machine learning models for forecasting tourist arrivals in Sri Lanka amid the COVID-19 pandemic. The ANN model stands out as the most suitable for accurate predictions, offering valuable insights for the tourism industry's planning and decision-making.

Keywords: COVID-19 impact, Deep learning, Machine learning, Sri Lanka, Tourist arrivals