



Conference Proceedings of the
3rd One Belt •

One Road •

One Tourism

International Conference

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Foreword from Conference Chair

Responding to China's Belt & Road Initiative, the School of Hotel and Tourism Management at The Hong Kong Polytechnic University pioneered the "One Belt One Road One Tourism" International Conference. This conference serves as a dynamic platform for fostering a global tourism academic community with a shared future among Belt & Road countries and regions. The inaugural conference took place in Indonesia in 2018, followed by the second conference in mainland China in 2019. The third "One Belt One Road One Tourism" International Conference is co-organized by the School of Hotel and Tourism Management at The Hong Kong Polytechnic University and the Hospitality Management and Tourism School at Central Asian University in Tashkent, Uzbekistan, from June 24-27, 2025.

The conference brings together scholars and professionals in hospitality and tourism to engage in meaningful interactions and share research findings and best practices under the theme "Development, Marketing, Sustainability." This year, the conference has accepted 95 abstracts and 8 full papers, which are published in the Conference Proceedings, showcasing the latest advancements and insights in the field.

As the conference continues to grow, it strengthens the bonds between participating countries and regions, fostering collaboration and innovation in tourism. By addressing key challenges and opportunities, the "One Belt One Road One Tourism" International Conference plays a crucial role in shaping the future of global tourism, promoting sustainable development, and enhancing cultural exchange. We look forward to the impactful discussions and partnerships that will emerge from this year's event, paving the way for a more connected and prosperous tourism landscape.

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Neural Networks vs. Traditional Models in Tourism: Performance Gains, Barriers, and Ethical Considerations

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Abstract

Rapid digital transformation has increased the use of artificial intelligence (AI) in tourism management, placing particular emphasis on neural network technologies. Neural networks offer potential improvements in demand forecasting, dynamic pricing strategies, service personalization, and process automation. Despite growing interest in these technologies, existing research often lacks detailed comparative analyses between neural networks and

traditional statistical methods, particularly in contexts characterized by seasonal and market fluctuations common to tourism.

This study addresses this research gap through a systematic comparative analysis of neural network models and conventional statistical techniques applied to key areas within the tourism industry. The research focuses specifically on tourist demand forecasting, dynamic pricing strategies, and personalized customer service solutions. Its originality is grounded in the direct comparison of neural network architectures, including Recurrent Neural Networks (RNN), Long Short-Term Memory networks (LSTM), and Multi-Layer Perceptrons (MLP), against established statistical methods such as the Autoregressive Integrated Moving Average (ARIMA). Moreover, the research identifies the conditions under which neural networks provide clear advantages over traditional approaches.

The methodology combines several research strategies to ensure depth and reliability of the findings. Firstly, a comparative analysis was performed using historical data sets collected from tourism enterprises, reflecting tourist flows and consumer preferences over a period of five years. These datasets formed the basis for comparing neural network models with traditional forecasting methods. Secondly, the research included expert interviews conducted with fifteen specialists from various tourism businesses, including managers and data analysts experienced in AI implementation. These interviews aimed to explore real-world experiences with neural networks, providing insights into practical benefits, implementation challenges, and adoption barriers. Lastly, empirical modelling was conducted to evaluate the effectiveness of neural networks across different tasks within tourism management. Evaluation metrics included Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and Net Promoter Score (NPS) to assess forecasting accuracy, effectiveness in pricing strategy adjustments, and customer satisfaction improvements, respectively.

The results revealed that neural networks outperformed traditional methods in predicting tourist demand. Specifically, LSTM-based models showed lower prediction errors compared to traditional ARIMA models when managing seasonally variable data. Additionally, neural network-driven dynamic pricing strategies enabled tourism businesses to respond more quickly and accurately to fluctuating market conditions, resulting in improved resource allocation and profitability. Likewise, neural network-based recommendation systems effectively personalized customer interactions, increasing client satisfaction and repeat bookings compared to traditional methods.

However, the study also identified several barriers to broader implementation of neural network technologies within the tourism sector. Key limitations include high initial investment requirements, inadequate technological infrastructure among small and medium-sized enterprises (SMEs), and a general shortage of skilled personnel capable of managing and interpreting neural network-based solutions. Interviews revealed that these issues significantly restrict widespread adoption, especially among smaller tourism operators.

Ethical concerns related to neural network usage also emerged as critical factors influencing their acceptance in the industry. The study highlighted issues such as algorithmic bias, consumer data privacy, and transparency of automated decision-making processes. Addressing these ethical challenges is essential, and requires clear regulatory frameworks that balance technological innovation with consumer protection. Recommendations from the research underline the necessity of developing transparent and accountable standards for neural network implementation, ensuring ethical compliance and reducing consumer risks.

To address these identified challenges, specific recommendations were provided. One key suggestion is closer cooperation between academic institutions and tourism businesses to align research findings with practical industry needs. Strengthening this collaboration will facilitate the creation of effective, practical neural network solutions, which tourism businesses can more easily adopt. Additionally, governmental support for SMEs through incentives, subsidies, or technical support programs was highlighted as an important factor in overcoming financial and infrastructural barriers. Furthermore, targeted training and professional development initiatives were recommended to enhance industry workforce skills related to the practical application of neural network technologies.

The practical significance of the research lies in providing clear guidelines and evidence-based insights for tourism businesses seeking to leverage neural network technologies for operational improvements. Results and recommendations offered by the study can serve as a foundational reference for developing digital transformation strategies aimed at enhancing forecasting accuracy, customer service quality, and overall operational efficiency. These improvements can directly contribute to sustainable competitive advantages for tourism enterprises operating in increasingly volatile market conditions.

Future research should explore the development and validation of hybrid forecasting models, integrating neural networks with traditional statistical approaches to further optimize prediction accuracy and reliability. Additionally, further exploration into the long-term effects of neural network integration across diverse geographic and market contexts will enhance understanding of their sustainability and scalability. Ethical considerations and regulatory frameworks surrounding AI implementation also merit deeper examination to ensure responsible use of neural networks within the tourism industry.

Overall, this study contributes to a deeper understanding of neural networks as effective tools in tourism management, clarifies specific contexts in which their application is justified, identifies current implementation barriers, and proposes concrete solutions for overcoming these challenges. The results and recommendations presented serve as a practical foundation for tourism enterprises and stakeholders aiming to leverage neural networks for enhanced competitiveness, operational efficiency, and sustainable industry growth.