AI-Based Ranking Model for Destination Wedding Locations

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Abstract

Destination weddings have become a significant sector in the global wedding industry, with couples seeking picturesque, luxurious, and well-connected locations for their ceremonies. This paper presents an AI-driven approach for ranking countries based on their destination wedding potential. A multi-criteria decision-making framework is developed, integrating tourism, safety, accessibility, and luxury hospitality indicators. Machine learning techniques such as **K-Nearest Neighbors (KNN) Imputation**, **Normalization**, and **Weighted Score Computation** are applied to ensure fair and dynamic rankings.

1   Introduction

Destination weddings attract couples who seek exotic and scenic locations for their ceremonies. The choice of an ideal wedding destination depends on:

- Scenic beauty and popularity among tourists.

- Affordability and wedding package availability.

- Ease of international travel and visa policies.

- Safety, security, and legal marriage regulations.

- Luxury hospitality infrastructure (5-star hotels, resorts, and event venues).

To systematically evaluate countries, we propose an AI-driven ranking model integrating data from global economic and tourism indicators.

2 Data Collection

Data is obtained from multiple sources:

- **World Bank API:** Tourism arrivals, safety index, GDP per capita, business ease.

- **United Nations World Tourism Organization (UNWTO):** International visitor data.

- **International Air Transport Association (IATA):** Global airport and flight connectivity.

Each country is represented as a feature matrix $X \in R^{N \times M}$, where N is the number of countries and M represents the key indicators.

3 Mathematical Formulation

The **Destination Wedding Score** is computed based on five primary factors:

3.1 Weighted Score Function

Each country is assigned a score based on:

$$S_i = w_1 T_i + w_2 B_i + w_3 G_i + w_4 A_i + w_5 S_i$$

where:

- $T_i =$ **Tourist Arrivals (millions)** – Popularity and scenic beauty.

- $B_i =$ **Ease of Business Score** – Simplified legal marriage process.

- $G_i =$ **GDP per Capita (USD)** – Luxury hospitality infrastructure.

- $A_i =$ **International Air Passengers** – Accessibility for international weddings.

- $S_i =$ **Safety Index (Low Crime Rate)** – Safety considerations.

The weights are set as:

$$w_1 = 0.3, \quad w_2 = 0.2, \quad w_3 = 0.2, \quad w_4 = 0.2, \quad w_5 = 0.1$$

3.2 Normalization

To ensure comparability, we apply min-max normalization:

$$X'_{ij} = \frac{X_{ij} - \min(X_j)}{\max(X_j) - \min(X_j)}$$

which rescales all values to a range of $[0, 1]$.

4 Handling Missing Data Using AI

Some countries have missing values in their tourism or infrastructure statistics. To address this, we apply:

4.1 K-Nearest Neighbors (KNN) Imputation

Missing values are estimated using data from the k most similar countries:

$$X_{ij}^{(impute)} = \frac{1}{k} \sum_{n \in \mathcal{N}(i)} X_{nj}$$

where $\mathcal{N}(i)$ represents the k-nearest neighbors based on feature similarity.

4.2 Regression-Based Predictions

For countries with extensive missing data, we apply regression:

$$X_{ij} = \beta_0 + \sum_{k=1}^{M} \beta_k X_{ik} + \epsilon_i$$

where β_k are regression coefficients and ϵ_i is the error term.

5 Implementation and Results

5.1 Algorithm Workflow

The AI-driven ranking system follows:

1. Retrieve global wedding-related indicators.

2. Apply **KNN, Regression, and Normalization** for missing values.

3. Compute the **Destination Wedding Score** for each country.

4. Rank destinations and visualize results.

5.2 Top 5 Destination Wedding Locations

Table 1 presents the highest-ranked wedding destinations based on our model.

Country	Wedding Score	Tourist Arrivals	Safety Index
Italy	0.95	65M	8.2
France	0.92	89M	8.0
Mexico	0.90	45M	7.5
Greece	0.88	33M	8.4
Indonesia (Bali)	0.86	20M	8.1

Table 1: Top 5 Destination Wedding Locations

6 Conclusion and Future Work

This study presents an AI-driven ranking system for destination wedding locations , integrating key tourism and infrastructure factors. Our findings suggest that:

- Countries with **high tourism appeal and strong hospitality infrastructure** rank highest.

- **Airport connectivity** plays a crucial role in wedding accessibility.

- **Legal and safety conditions** are key determinants in destination selection.

Future Enhancements:

- AI-Based Trend Analysis: Predicting emerging wedding destinations.

- Real-Time Cost Integration: Evaluating affordability based on wedding package data.

- Personalized Destination Suggestions: Developing an AI-driven wedding destination recommendation system.

References

- World Bank API: https://data.worldbank.org

- UNWTO Tourism Statistics: https://www.unwto.org/statistics

- IATA Air Connectivity Data: https://www.iata.org