AI-Powered Guest Experience Personalization System for Hospitality

Transforming hospitality with AI-driven personalization. Elevating guest satisfaction through dynamic recommendations and real-time feedback analysis. Ensuring proactive service optimization and seamless issue resolution. Enhancing guest loyalty with data-driven insights and personalized experiences.

Objectives

1 Personalized Recommendations

Tailored dining, activities, and amenities. Driven by guest behavior analysis.

2 Real-Time Sentiment Monitoring

Proactive addressing of guest feedback. Ensures immediate action.

3 Increased Guest Satisfaction

Dynamic personalization enhances experience. Achieves elevated satisfaction.

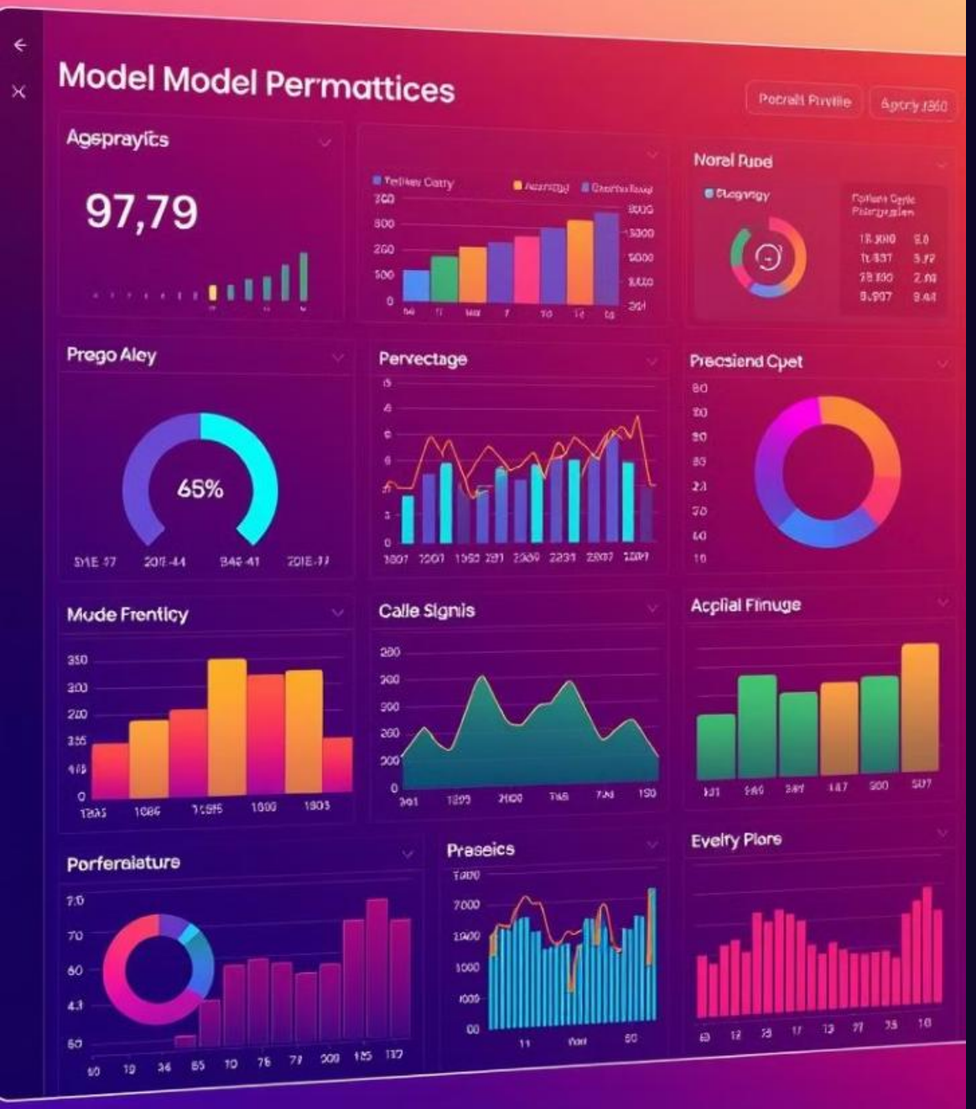
4 Automated Alerts

Staff receive alerts for issue resolution. Optimizes service delivery.

XGBoost for Favorite Dish Prediction

Why XGBoost?

- **Efficient & Robust for Imbalanced Data:** Handles imbalanced datasets in guest dining preferences .
- **Handling Imbalance:** Built-in scale_pos_weight ensures rare dish preferences are not overlooked.
- **Feature Insights:** Identifies key factors influencing dining choices, refining recommendations
- **Performance vs. Random Forest:** Faster training, scalable, with L1/L2 regularization to prevent overfitting.
- **Future Enhancements:** Despite 0.18 accuracy, trends are valuable. hybrid models can improve predictions.



Model Evaluation & Significance

0.18

Accuracy

Achieved model accuracy

2.7x

Better

Vs. random chance

15

Classes

Distinct Dish Choices

Our model's 0.18 accuracy is 2.7x better than random chance. This demonstrates significant predictive capability. Even with high dimensionality and guest variability, 0.18 accuracy allows targeted recommendations. This improves customer satisfaction and sales.

🍽️ Personalized Dish Recommendations & Discounts

Enhance guest experience with AI-powered dining suggestions! Our system personalizes dish recommendations based on individual preferences, stay details, and past dining behavior, all while offering exclusive discounts.

Customer Data Processing

We analyze inputs such as age (e.g., 25-35), cuisine preference (e.g., North , South, Multi), stay duration (e.g., 3 days, 7 days), and past dining behavior to understand your unique tastes.

Model Prediction (XGBoost)

Our XGBoost algorithm assigns probability scores to various dishes based on data analysis. The system generates "Probability Scores" (e.g., Dish A: 92%, Dish B: 88%, Dish C: 85%) to identify the best options.

Personalized Recommendations

Discover **top 3 dishes tailored to your preferences**, along with a certain amount of discount on each. Examples include: South Indian Cuisine (Idly, Dosa, Sambar), North Cuisine (Roti, Dal, Thali), or Multi (Steak, Noodles, Salad).

Personalized Guest Experience: Smart Recommendations & Discounts

- **Personalized Recommendations**: Enhancing guest experience with tailored amenity and activity suggestions.
- **Dynamic Booking Interface:** Adapts in real-time based on user preferences and behavior.
- **Hybrid Filtering Approach:** Combines user-based and item-based filtering for accurate predictions.
- **Automated Email Alerts:** Coupon codes, recommended dishes, and offers are sent directly via email.

Retrieval-Augmented Generation (RAG)

Definition

RAG combines retrieval with generation. It provides accurate, context-aware responses. RAG summarizes and extracts insights from hotel reviews.

How It Works

Retrieval Phase: Searches reviews for relevant information.
Generation Phase: AI generates responses based on retrieved data.

Application

Extracts guest sentiments from reviews.

Generates insights on quality and experience.

Personalizes recommendations for guests.

RAG (Retrieval-Augmented Generation) System Workflow for Guest Review Analysis

1

Collect Guest Reviews

Gather data from sources from User review submissions.

2

Convert to Embeddings

Transform reviews into numerical vectors. Use TogetherEmbeddings.

3

Store in Pinecone DB (Vector DB)

Index embeddings in Pinecone for fast search. Cloud-native vector database.

4

Query for Relevant Reviews

Formulate queries with keywords and filters. Converts text into numerical vectors for better AI comprehension

5

Retrieve Top Reviews

Fetch relevant reviews based on similarity scores.

6

Summarize Using LLM Model (Together.ai)

Generate concise summaries of the retrieved reviews.

7

Output Insights & Recommendations

Present key insights and recommendations.

Guest Experience Insights: Integrated Dashboards

Objective: Empowers managers with real-time analytics that boost guest experience, drive operational excellence, and unlock business growth.

Hotel Booking Insights

Reveals guest booking patterns by cuisine preference, helping managers create targeted offerings and optimize marketing strategies to increase revenue and guest satisfaction.

Dining Intelligence Center

Provides real-time data on dining behaviors and preferences, enabling better staffing, menu planning, and service delivery to enhance restaurant performance and guest experience.

Guest Feedback Command Center

Identifies key service strengths and improvement areas from guest reviews, allowing managers to address issues quickly and replicate successful practices across operations.

Thank You