



RESTAURANT RECOMMENDATION USING AI

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Abstract

Choosing a suitable restaurant can be difficult when users must compare cuisine, price, distance, ratings, dietary needs, and personal preferences across multiple sources. This paper presents a conceptual AI-based Restaurant Recommendation System that aims to make restaurant discovery more relevant and efficient. The proposed system collects user preferences such as preferred cuisine, budget, location, rating threshold, and dietary requirements. It then filters candidate restaurants and ranks them using a recommendation score that may combine preference similarity, distance, rating, and affordability. A modular design separates the user interface, data processing, restaurant dataset, recommendation engine, and results display. The approach can be implemented using a web or mobile interface and a structured restaurant database. The system is intended to provide personalized suggestions while allowing users to understand why a restaurant was recommended. This document is a student research-paper sample; implementation details, dataset sources, measured results, and references should be verified and updated according to the student's actual work before submission.

Keywords: Artificial Intelligence; Restaurant Recommendation; Recommender System; Personalization; Machine Learning; Ranking Algorithm

I. INTRODUCTION

A. Background and Context Restaurants are an important part of daily life, travel, and social activities. With a growing number of restaurants and online reviews, users often face information overload when trying to find a place that matches their tastes and budget. Traditional search methods usually require users to manually compare many listings. An AI-assisted recommendation system can organize available information and personalize results according to the user's needs. B. Problem Statement Restaurant listings may be distributed across different websites and applications, and the most highly rated option is not necessarily the best fit for every user. A user may prefer a specific cuisine, need a low-cost meal, require vegetarian options, or want a restaurant close to a chosen location. The problem is to provide relevant recommendations by considering several factors together rather than relying on a single rating or keyword. C. Aim and Objectives The aim is to design an AI-based system that recommends restaurants based on user preferences. The objectives are to collect preference inputs; filter restaurants by location, cuisine, price, and dietary options; calculate a relevance score; display ranked recommendations; and provide a design that can be extended with feedback and learning from user interactions. D. Significance and Contribution The proposed approach combines multiple practical criteria in a single recommendation workflow. It can reduce manual comparison and make discovery more convenient. The design also allows future extensions such as learning from clicks, saved restaurants, reviews, and previous selections. Recommendations should remain transparent and should not present unavailable or unverified restaurant information as fact. E. Organization of the Paper The remaining sections discuss related work, the proposed methodology, implementation considerations, an evaluation plan, limitations, future scope, conclusion, and references.

TABLE I

Feature	Purpose
Cuisine preference	Matches restaurant cuisine with the user's stated preference.
Budget / price range	Removes or penalizes options outside the user's expected spending range.
Location / distance	Prioritizes restaurants near the selected location, if coordinates are available.
Rating / review signal	Uses available ratings as one factor rather than the only ranking criterion.
Dietary requirements	Filters for vegetarian, vegan, or other options only when reliable data is available.
Past feedback (optional)	Can refine future recommendations when user interactions have been collected.

TABLE II

Step	Operation
1	Receive user preferences, including location, cuisine, and budget.
2	Validate and normalize the submitted values.
3	Retrieve restaurant records from the available dataset or service.
4	Apply mandatory filters such as budget, distance, and dietary requirements.
5	Calculate a preference score for each eligible restaurant.
6	Sort restaurants by score and select the top results.
7	Display the recommendations with available details and reasons.
8	Optionally collect feedback for future evaluation and improvement.

II. LITERATURE REVIEW / RELATED WORK

A. Overview Recommendation systems are commonly used to help users discover items from large collections. Content-based approaches compare item attributes with a user's stated or inferred preferences. Collaborative filtering uses patterns in the choices of similar users. Hybrid systems combine multiple methods to improve recommendation quality and reduce the limitations of relying on only one signal. In restaurant discovery, useful attributes can include cuisine, price, location, opening

hours, rating, ambience, and dietary suitability. B. Common Recommendation Approaches Content-based filtering can recommend restaurants whose attributes match a user's preferences. Collaborative filtering can identify restaurants liked by users with similar behaviour, when sufficient interaction data is available. A hybrid approach can combine preference matching with popularity, ratings, distance, and user feedback. For a student-scale prototype, a weighted scoring method is a practical starting point because its behaviour is easier to explain and test. C. Research Gap A single rating or popularity score may not capture the personal constraints that matter to a particular diner. A useful system should consider multiple preferences, handle missing information carefully, and explain its ranking. The proposed work focuses on a simple, modular design that combines preference filtering and weighted ranking, while leaving advanced machine-learning methods as an extension once sufficient data is available. D. Proposed Contribution The proposed system outlines a transparent recommendation pipeline: collect preferences, filter the available restaurant records, score the remaining candidates, and show a ranked list with the factors that influenced the result. This is a design proposal; any claim of improved accuracy or user satisfaction must be supported by experiments conducted on the actual implementation.

III. PROPOSED SYSTEM AND METHODOLOGY

A. System Architecture The system is organized into five main stages. The interface collects user preferences. The processing module validates and normalizes the inputs. The restaurant dataset supplies available attributes. The recommendation engine filters and ranks candidate restaurants. Finally, the response layer presents the top matches and, where possible, explains why each result was selected. User Interface / User Preferences Input Processing & Preference Extraction Restaurant Dataset (cuisine, price, location) Recommendation Engine (content / ranking) Context Filters (distance, rating, diet) Ranked Restaurant Recommendations

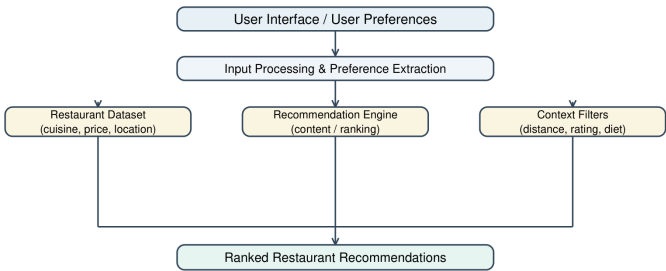


Fig. 1. Simplified architecture of the AI-based Restaurant Recommendation System.



Fig. 2. User preference and restaurant ranking workflow.

IV. IMPLEMENTATION DETAILS

TABLE III	
Component	Possible implementation
User interface	Responsive web interface or mobile application with preference controls and result cards.
Backend/API	REST API for receiving preferences, retrieving records, and returning ranked results.
Database	Structured restaurant records containing name, cuisine, price range, location, ratings, and available facilities.
Recommendation engine	Weighted scoring baseline; optional content-based or hybrid model in later versions.
Map/location service	Optional location/geocoding service, subject to API terms and permission.
Deployment	Local server or cloud deployment with protected credentials and appropriate privacy controls.

V. RESULTS AND EVALUATION PLAN

TABLE IV		
Test	Input / condition	Expected behaviour
T1	Cuisine and budget specified	Eligible restaurants matching both preferences are ranked.
T2	Very small search radius	Nearby candidates are prioritized or a clear no-results message is shown.
T3	Dietary requirement selected	Only records with reliable matching information are retained.
T4	Some restaurant fields missing	Missing data is handled transparently without inventing values.
T5	No matching restaurant	The system explains that no matches were found and offers filter changes.
T6	Dataset/API unavailable	A graceful error message is displayed.

VI. LIMITATIONS AND FUTURE SCOPE

A. Limitations The quality of recommendations depends on the accuracy, coverage, and freshness of the restaurant dataset. User ratings can be biased or inconsistent, and a weighted scoring model may not represent every user's preferences. Location accuracy may vary, while external APIs can have cost, rate-limit, or availability constraints. Dietary information and opening hours require particular care because incorrect data can inconvenience users or create safety concerns. B. Future Scope Future work may incorporate collaborative filtering when sufficient interaction data is available, natural-language preference input, multilingual support, review sentiment analysis, map-based exploration, and feedback-driven ranking. A mobile application could provide saved lists and trip-based discovery. These extensions should be evaluated for usefulness, privacy, reliability, and bias before deployment.

VII. CONCLUSION

This paper presents a conceptual design for an AI-based Restaurant Recommendation System that combines user preferences with restaurant attributes to produce a ranked list of relevant options. The proposed modular workflow includes preference collection, data filtering, scoring, and result explanation. A weighted scoring baseline offers a transparent starting point, while content-based and hybrid recommendation techniques can be added as data and evaluation capacity improve. To make the work suitable for publication, the implementation, data sources, test procedure, measured results, and references must be verified and documented by the author. The system should clearly communicate uncertainty and avoid presenting incomplete or outdated restaurant information as confirmed fact.

REFERENCES

[1] F. Ricci, L. Rokach, and B. Shapira, eds., *Recommender Systems Handbook*, 3rd ed. Springer, 2022.

[2] M. J. Pazzani and D. Billsus, "Content-Based Recommendation Systems," in *The Adaptive Web*, Springer, 2007, pp. 325–341.

[3] J. B. Schafer, D. Frankowski, J. Herlocker, and S. Sen, "Collaborative Filtering Recommender Systems," in *The Adaptive Web*, Springer, 2007, pp. 291–324.

[4] Y. Koren, R. Bell, and C. Volinsky, "Matrix Factorization Techniques for Recommender Systems," *Computer*, vol. 42, no. 8, pp. 30–37, 2009.

[5] G. Adomavicius and A. Tuzhilin, "Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions," *IEEE Transactions on Knowledge and Data Engineering*, vol. 17, no. 6, pp. 734–749, 2005.

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