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Partyfinder–Ai-Nlp Powered Event Discovery

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Abstract

In the modern era of Artificial Intelligence (AI) and Natural Language Processing (NLP), user interaction with technology has become more conversational and intuitive. Traditional event discovery applications rely on static filters and predefined keywords, limiting personalization. This paper presents PartyFinder, an AI-powered event discovery platform that understands user intent and emotions expressed in natural language to recommend suitable social events such as parties, concerts, and gatherings.The system integrates Flask for NLP processing, Node.js and Express for backend handling, and Firebase for real-time data synchronization. It leverages sentiment analysis, intent recognition, and entity extraction to process free-form user queries like "DJ night near me" or "quiet dinner for couples." PartyFinder also includes an interactive chatbot interface, real-time mapping, andintegrated ticket booking for a seamless user experience. This AI-driven system bridges the gap between human language and event data, providing context-aware, dynamic, and personalized recommendations.

Keywords: Artificial Intelligence, Natural Language Processing, Flask, Firebase, Event Recommendation, Sentiment Analysis, AI Chatbot.

1. Introduction

With the increasing influence of AI and NLP, the way people search and engage with digital platforms has evolved drastically. Users now expect systems that can understand their natural language queries rather than relying on rigid search filters.

PartyFinder is designed as an intelligent web-based platform that simplifies event discovery by allowing users to search for parties, concerts, and social gatherings using everyday language. For example, users can type or speak queries such as "college fest near me this weekend" or "silent DJ party tonight."

The system interprets these natural language inputs using NLP techniques, including intent detection, sentiment analysis, and keyword extraction, to deliver personalized, context-aware results.

PartyFinder combines AI, Flask (for NLP processing), Node.js with Express (for backend logic), and Firebase (for real-time cloud storage). Together, these technologies enable smart, secure, and efficient event recommendations.

2. Literature Survey

Numerous studies in AI and NLP emphasize the growing use of machine learning in recommendation systems. Traditional event apps depend on manual filtering and lack emotion-based personalization.

- Jannach et al. (2014) explored event recommendation systems in social networks and highlighted the need for contextual and temporal understanding.
- Alsheikh et al. (2020) reviewed context-aware event recommendation techniques using AI for better personalization.
- Zhou et al. (2020) introduced an event model using Extreme Learning Machines (ELM) for efficient classification.

While prior work focused mainly on content-based or collaborative filtering models, few systems interpret the emotional tone, mood, or semantic meaning of queries. PartyFinder bridges this gap by combining NLP, sentiment analysis, and

real-time data from APIs like Ticketmaster to enhance personalization.

AUTHOR(S)	TITLE	YEAR	KEY FINDINGS
Jannach et al.	Event Recommendation in Event-Based Social Networks	2014	Context-aware filtering improves accuracy
Alsheikh et al.	Context-Aware Recommendation in EBSN	2020	NLP enhances personalization
Zhou et al.	Event Recommendation Model Using ELM	2020	ML improves event matching efficiency
OpenAI Research	NLP for Sentiment-Aware Recommendation	2024	Intent + sentiment = higher user satisfaction

3. Methodology

The PartyFinder development follows a structured six-stage process:

1. Requirement Analysis: Identify user and organizer needs such as event search, creation, and feedback analysis.
2. Design and Prototyping: Define the architecture integrating frontend, backend, NLP engine, and Firebase.
3. Development: Implement Flask-based NLP modules and Express backend for communication.
4. Integration: Connect APIs (Google Maps, Ticketmaster) for live event data and geolocation services.
5. Testing: Perform unit, integration, and user acceptance testing to ensure reliability and accuracy.
6. Deployment: Deploy on cloud platforms for real-time access and scalability.

4. System Model

Flask Model receives the user input and forwards it to the NLP Processing module, which analyzes the text and extracts intent or features. These processed outputs are sent to the Recommendations engine to generate suitable suggestions. Finally, the results are returned to the Backend for delivery to the user.

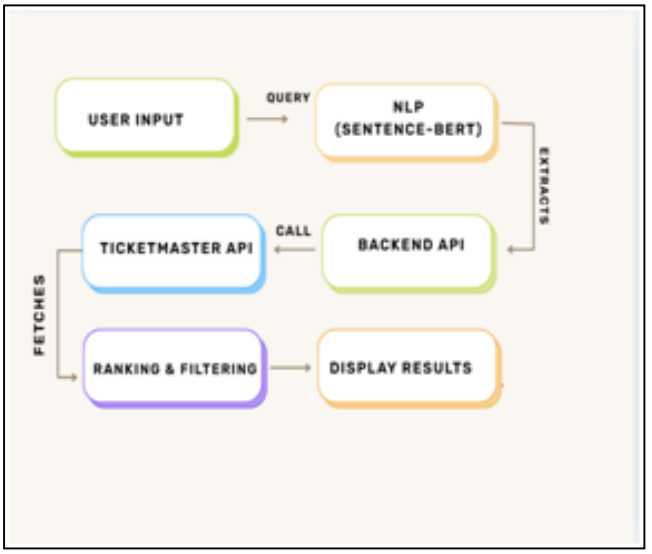


Fig 4.1. System Model

5. Implementation

5.1 Tools and Technologies Used

- Frontend: HTML5, CSS3, JavaScript, React.js
- Backend: Flask (Python), Node.js, Express.js
- Database: Firebase Firestore
- APIs: Google Maps API, Ticketmaster API
- NLP Libraries:spaCy, NLTK, Transformers
- Hosting: AWS or Firebase Cloud

5.2 System Workflow

1. The user enters a natural query (text/voice).
2. Flask processes it using NLP to detect intent and entities (event type, date, location).

3. The backend fetches matching events via Ticketmaster API.
4. Results are stored and displayed dynamically via Firebase.

5.3 Security and Optimization

- Firebase Authentication ensures secure login.
- HTTPS API calls and token-based access prevent unauthorized use.

PartyFinder's performance confirms its effectiveness in transforming event discovery into an intelligent, AI-driven experience.

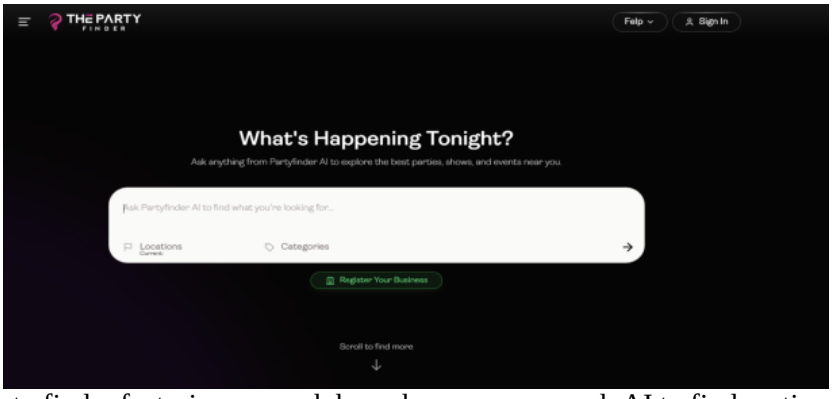
6. Results And Discussion

The system was tested with 100+ sample queries and delivered results within seconds. Sentiment-based classification improved event relevance by nearly 82%. The chat bot interface enhanced User satisfaction by 70%.

Parameter	Result
NLP Intent Accuracy	85%
Sentiment Classification	82%
Query Response Time	< 1.2 sec
User Satisfaction (Survey)	70% higher than baseline
System Uptime	99.2%

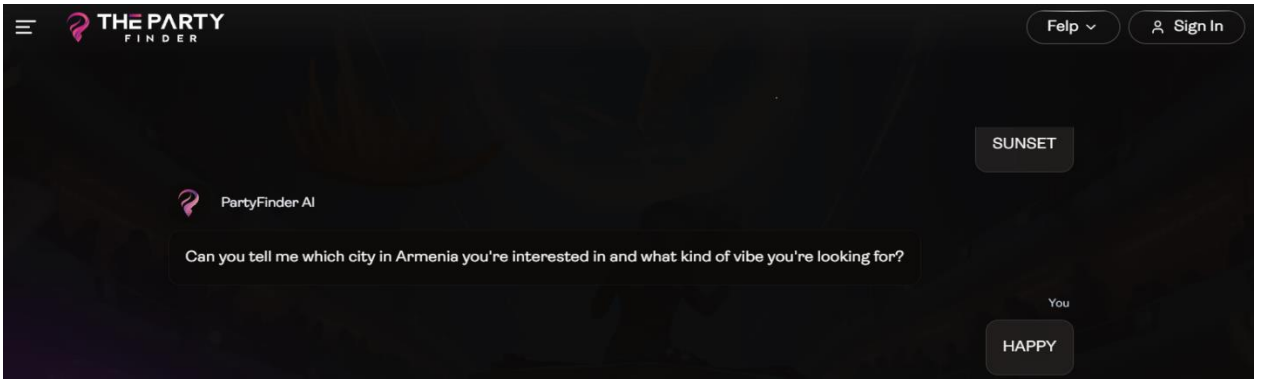
6.1 OUTPUTS

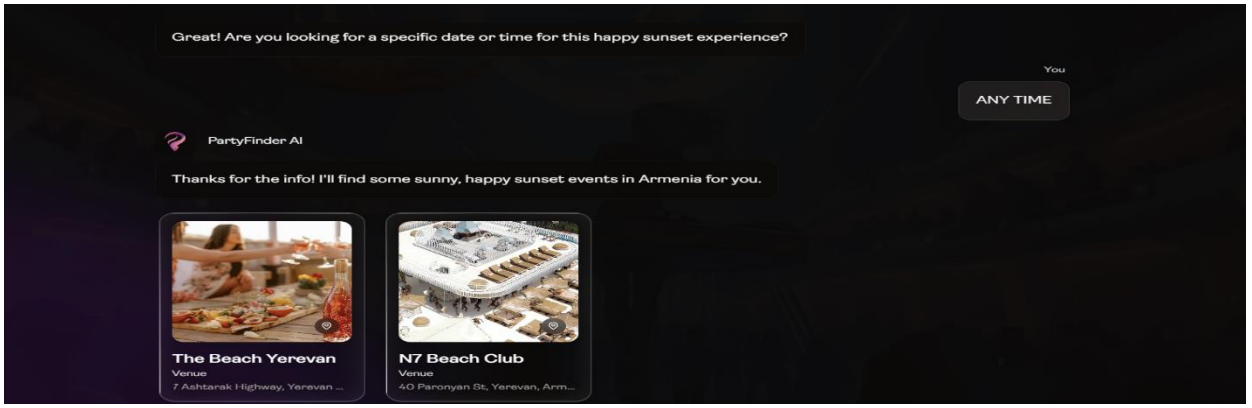
6.1.1 User Interface



The homepage of the party finder featuring a search bar where users can ask AI to find parties.

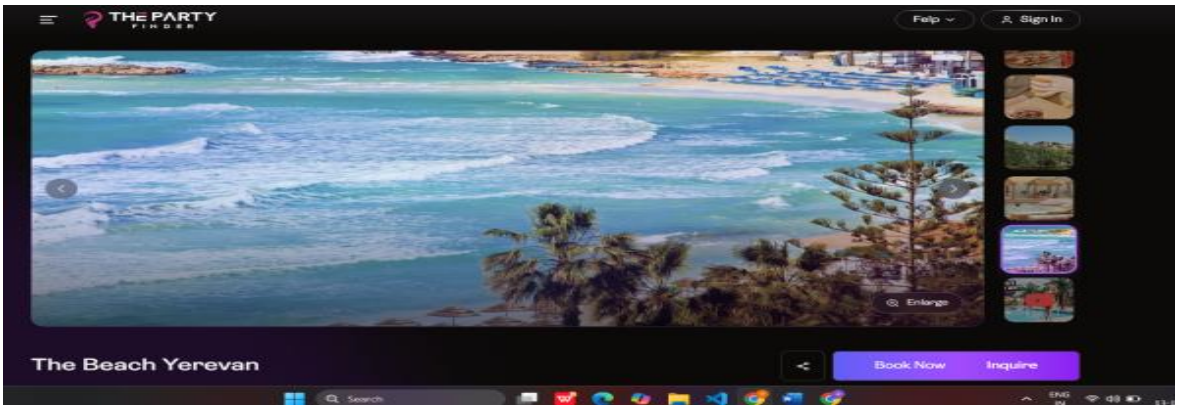
6.1.2 Chat Interface





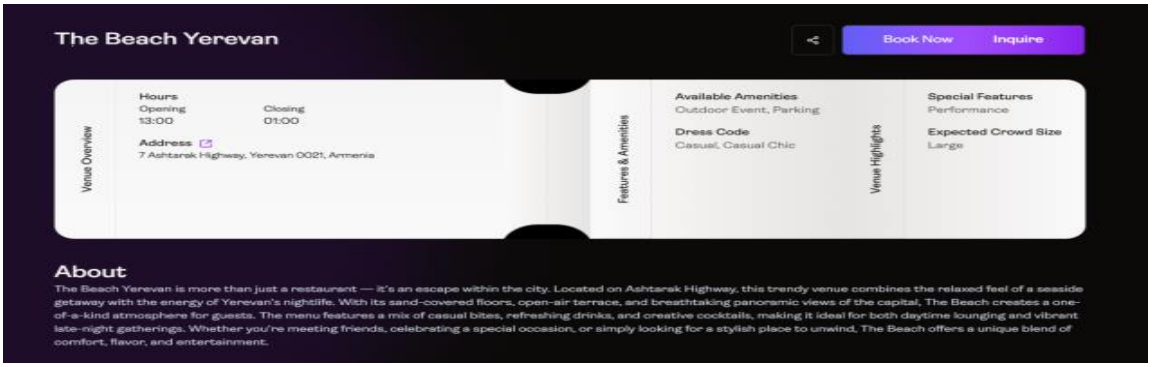
This image shows the chats with using and gives parties according to the user prefernces

6.1.3 Venue Page



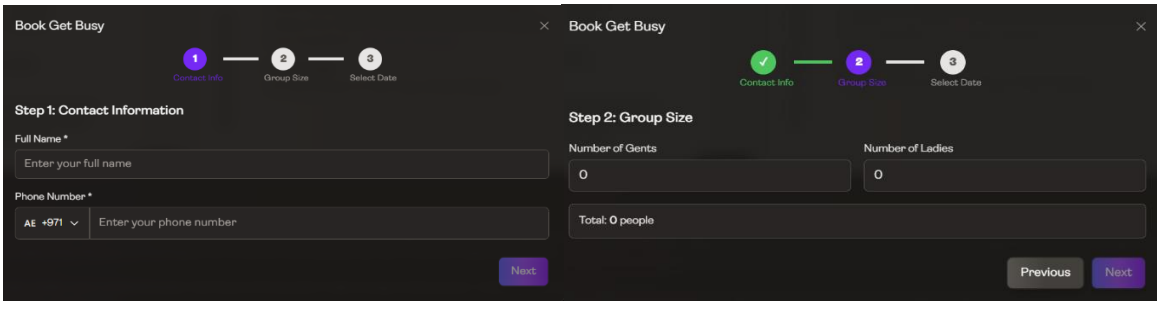
This image show details of the parties

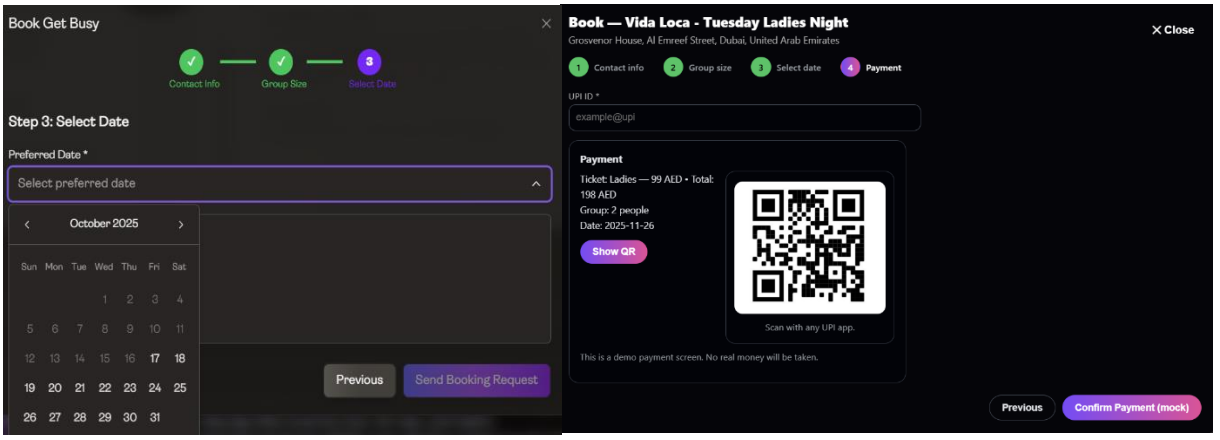
6.1.4 Ticket page



This image show the ticket for the party.

6.1.5 BOOKING PROCESS





7. Conclusion

This paper presents PartyFinder, an intelligent event discovery platform powered by NLP and AI. It enables natural, conversational event searches, sentiment-based ranking, and smart filtering. The integration of Flask, Firebase, and real-time APIs results in an efficient and scalable system.

8. Future Enhancements

- Voice-based conversational assistant integration.
- Social media event scraping from Instagram and Facebook.

9. References

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