Port Said University
Faculty Of Engineering
Department Of Electrical Engineering

Graduation Project Proposal

AI and AR Based Smart Tourism Platform

Team Members:

1. Mohamed Mousad Handouka

2. Ahmed Bassem Elshafey

3. Mohamed Khaled Elsayed

4. Mohamed Eltabey Elshenawy

5. Zeyad Khaled Elsayed

1. Motivation

Tourism is one of the most vital sectors that significantly contributes to economic growth and cultural exchange. However, tourists often face challenges when planning and experiencing trips, such as difficulty in building optimized itineraries, lack of reliable information, and limited engagement during visits. Traditional travel applications usually focus on either booking or providing general information, which does not fully address the needs of modern travelers who seek personalized, interactive, and immersive experiences. The motivation behind this project is to create a hybrid platform that integrates Artificial Intelligence (AI) and Augmented Reality (AR). AI will provide smart trip planning tailored to individual preferences and constraints, while AR will enhance on-site experiences by delivering real-time information, 3D reconstructions, and gamified interactions. This hybrid approach aims to bridge the gap between planning and experiencing tourism, offering a comprehensive solution to improve the quality and satisfaction of tourists' journeys.

2. Literature Review

Tourism technologies have evolved significantly in recent years, driven by the increasing reliance on digital tools to enhance travelers' experiences. Current solutions include online booking platforms, trip planners, and tourism recommendation systems. For instance, platforms such as Expedia and Booking.com provide comprehensive services for accommodation and flight reservations but lack personalized itinerary generation. On the other hand, Google Travel offers limited itinerary suggestions but primarily relies on predefined data rather than deep personalization through artificial intelligence.

AI-powered recommendation systems have been employed to suggest destinations and activities based on user profiles. Research in this area emphasizes the importance of machine learning and natural language processing to provide personalized recommendations. However, these systems remain largely text-based and fail to deliver immersive experiences. In parallel, augmented reality has been increasingly applied in tourism to provide interactive guides, historical reconstructions, and gamified experiences. For example, AR applications in museums allow visitors to view 3D models of ancient artifacts and learn contextual information through overlays. Despite these advancements, AR tools often operate independently from AI-driven planning solutions.

Project Objectives

The primary objective of this project is to develop a hybrid tourism platform that leverages Artificial Intelligence (AI) for smart trip planning and Augmented Reality (AR) for immersive on-site experiences. The system aims to simplify the process of designing itineraries by providing personalized recommendations based on user preferences, budget, and time constraints. During the trip, the AR component will enrich the tourist's journey by delivering contextual information, visual reconstructions,

and gamified activities in real-time. By combining AI and AR, the project seeks to bridge the gap between pre-trip planning and on-site exploration, ultimately enhancing user engagement, cultural awareness, and overall satisfaction. Additionally, the system aims to demonstrate the feasibility of integrating emerging technologies in tourism, showcasing a prototype that can potentially evolve into a scalable and commercial solution.

3. Project Specification

The proposed platform will consist of two main modules: the AI Trip Planner and the AR Experience System. The AI module will analyze user input such as budget, available days, preferences, and historical data to generate optimized itineraries. This will be achieved using machine learning algorithms and recommendation techniques that balance cost, time, and user interests. A chatbot interface will be integrated to allow natural interaction with the system.

The AR module will enhance on-site experiences by overlaying contextual information, 3D models, and interactive elements through a mobile application. For instance, when a user visits a historical site, the AR feature can display reconstructions of the site's original form or provide gamified elements like quizzes and collectible tokens to increase engagement.

The final prototype will be a mobile application (Android/iOS) connected to a backend server hosting AI algorithms and a content management system for AR data. The platform will be evaluated based on usability, performance, accuracy of recommendations, and user engagement metrics. A block diagram of the system components will illustrate the architecture, including modules for user input, AI processing, AR rendering, database management, and system integration.

4. Project Schedule

5. Week 1–2: Requirement gathering and system design
6. Week 3–4: Development of AI trip planning module
7. Week 5–6: Development of AR experience module
8. Week 7: Integration of AI and AR modules
9. Week 8: Prototype testing and debugging
10. Week 9: Performance evaluation and user testing
11. Week 10: Documentation and final presentation preparation

12. References

1. Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management.

2. Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search.