A

Project Proposal

On

Disha

Indoor Navigation using Augmented Reality

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1. Problem Statement

Current indoor campus navigation struggles with 2D maps and external services, hampering user convenience. Our project aims to transform this experience by integrating augmented reality (AR) technology. By overlaying digital information onto the real environment, we strive to create an intuitive and user-friendly navigation solution. Our goal is to revolutionize indoor navigation, overcoming reliance on traditional methods and providing a seamless experience for users navigating campus spaces.

2. Objective

The Objective of this Project is to address the challenges faced by modern campus navigation. Systems, particularly in providing intuitive and high-precision navigation for indoor environments. The focus is on enhancing user experience and overcoming limitations such as reliance on 2D information, network queries, and third-party service platforms. The proposed solution integrates augmented reality (AR) technology to superimpose computer-generated. virtual objects and information onto the real environment. This aims to create a more interactive and user-friendly campus navigation experience.

3. Methodology

1. Identifying Challenges: Analyze existing campus navigation systems to understand limitations in indoor navigation precision and user experience, including reliance on 2D data, network dependencies, and external service platforms.

2. Research and Analysis: Conduct comprehensive research on augmented reality (AR) technology, focusing on its application in enhancing navigation experiences. Evaluate its potential to overcome identified challenges.

3. Requirements Gathering: Define specific user requirements and system functionalities needed to improve indoor navigation precision and user interaction. This involves gathering feedback from potential users or stakeholders.

4. AR Integration Planning: Strategize the integration of AR technology into the navigation system. Plan for superimposing virtual objects and information onto the real environment to enhance interactivity and user-friendliness.

5. Development and Testing: Utilize chosen technologies to develop the AR-powered navigation system. Implement features that address identified challenges. Thoroughly test the system to ensure high precision, usability, and reliability.

6. Evaluation and Feedback: Evaluate the system's performance through user testing and feedback sessions. Assess its effectiveness in providing intuitive navigation and overcoming previous limitations.

7. Refinement and Enhancement: Incorporate user feedback and evaluation results to refine the system further. Enhance functionalities, user interfaces, and precision based on feedback for an improved navigation experience.

8. Documentation and Reporting: Document the entire development process, methodologies employed, challenges faced, and solutions implemented. Provide a comprehensive report outlining the project's methodology and outcomes.

4. Scope

- Design and implement a mobile campus navigation app.
- Utilize visual inertial odometry and ARCore-based fusion technology.
- Address limitations of current navigation systems.
- Provide 3D augmented data merged with real buildings.
- Ensure high-precision navigation within indoor environments.
- Offer a diverse set of augmented reality features.
- Employ Unity as the primary development platform.
- Incorporate human-computer interaction functions for varied user scenarios and needs..

5. Project Output

The project output is a comprehensive overview and proposal for a mobile campus navigation app. It includes an analysis of the existing navigation system's limitations and proposes solutions using augmented reality (AR) technology to enhance navigation accuracy and user interaction. The characteristics of the proposed system are defined, focusing on AR-based routes, precise navigation using visual odometry, inertial sensors, and Unity platform integration for interactive features. The paper's structure delineates sections covering related work, key technologies, system implementation, testing and analysis, evaluation, and conclusions, providing a thorough exploration of research, technological foundations, practical implementation, testing outcomes, and final reflections on the mobile campus navigation app proposal.

6. Budget

The project aims to address existing challenges in campus navigation by integrating AR to provide precise and intuitive navigation within indoor environments. We seek a funding amount of Rs 10,000 to acquire essential tools and software licenses crucial for the project's successful implementation.