

Construction and Application Research of an Integrated Campus Promotion Platform Based on “AR+Map”—A Case Study of Jiangxi University of Finance and Economics

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Abstract: This paper aims to research and develop a campus map application based on augmented reality (AR) technology, aiming to provide a more intuitive and interactive campus navigation experience. Based on the analysis of existing navigation systems and related research literature, this study designs an innovative AR campus map application prototype based on Jiangxi University of Finance and Economics. This application utilizes AR technology, combines campus map data and location information to provide users with real-time navigation and positioning functions, and displays relevant campus information. The results of this paper can provide guidance for the development and optimization of campus navigation systems, and also have reference value for the application of AR technology in the field of education.

Keywords: Augmented Reality; Campus Navigation

1. Introduction

In 2016, the State Council of China issued the "13th Five-Year National Informatization Plan," which explicitly stated the need to accelerate the R&D and frontier deployment of new technologies such as virtual reality (VR) and augmented reality (AR), in order to establish a leading advantage in the new competitive arena. Since then, with the rapid arrival of 5G commercialization, AR technology has entered the fast lane of development. The VR industry has been growing rapidly, with continuously improving core technologies and expanding innovative applications. From the perspective of AR technology usage, its purpose is to enhance user experience and intuition, and achieve the integration of virtual information and the real environment through intelligent applications and services in the process of constructing smart campuses. Ultimately, this enhances the user's contextual understanding and immersive experience. Therefore, this study focuses on the organic integration of the AR industry and university culture in Nanchang, providing theoretical and practical foundations for the future maturity and improvement of the "AR+Campus" model and technology.

2. Application and Development

2.1 The current state of AR development

AR technology combines computer algorithms to cover 3D virtual models in real-world environments. It changes the visual experience by surrounding users with multidimensional views and adding virtual layers to reality. Unlike VR technology that typically isolates users in virtual environments, AR allows users to interact with both virtual and real elements simultaneously.

AR technology overlays 3D virtual models into real environments to enhance the visual experience. Unlike VR technology, AR allows users to interact with both virtual and real elements simultaneously. It has applications in various industries such as industrial maintenance, marketing, and daily life. The integration of artificial intelligence and AR has changed people's habits and work methods, bringing about expected growth in the AR industry.

2.2 Preliminary exploration of AR technology in campuses

AR technology has made rapid progress since its establishment in the 1960s. In terms of its application in campus environments, AR technology has relatively more applications abroad. Various virtual technologies aim to provide convenience for students' learning, lectures, courses, and self-learning. The difference between AR technology and traditional technology lies not only in its technological progress, but also in its extensive and innovative applications. Although there has not been in-depth research on its application in campus culture, AR technology has taken an important step in foreign campus education.

In recent years, the use of AR in campus environments has been expanding. The development of virtual campuses allows users to navigate and browse with just one click of a button. Campus navigation is an important component of exploring universities and understanding university facilities. An excellent campus navigation system can provide accurate locations of internal facilities for newcomers or visitors, and provide detailed information when they access these facilities, helping users quickly familiarize themselves with the campus environment. Therefore, building an AR campus is an indispensable way for the development of virtual technology.

3. The distinctive application of “AR + Campus Maps”

3.1 The immersive understanding and guided exploration of university campuses

The platform will make use of the advantages of its members, integrate map software technology, and create a smart campus map of Jiangxi University of Finance and Economics. We will also conduct comprehensive 3D photography and imaging of famous landmarks on campus, such as the library, Zodiac Square, and academic buildings. Establish a backend information database through visual imaging and other technological processing methods to achieve deep interaction between individuals and the campus environment.

For high school graduates, campus cultural life is an important factor affecting their choice of university. Through AR technology, users can use mobile devices to view 3D representations of the campus. They only need to find a small space to experience immersive travel. If future students can experience campus culture and atmosphere in advance through this platform, it will greatly help them choose a university. Similarly, for other users, they often have high expectations and aspirations for campus life. Immersive travel experiences can satisfy their curiosity and become an important way to promote the campus and attract new students.

3.2 Integration of Social Messaging and Shared Interactive Exploration

In order to enhance the interactive experience, the platform will provide Bulletin board function at specific locations. Students can access the Bulletin board by scanning the QR code at the designated place or clicking the relevant scene on the map. In the Bulletin board, users can share their experiences, interesting stories, campus anecdotes, and even campus romantic stories related to specific locations. Users can choose to leave real or anonymous messages, and can also participate in basic chat functions such as replies, citations, and deletions. This allows for real-time interaction between alumni. In order to ensure the authenticity of information and the spread of campus experience, participants in the Bulletin board will be limited to college students and recent graduates. For new students, only the reply function is provided to let them understand the experiences and feelings of other alumni before starting campus life. This design aims to provide users with the most authentic campus atmosphere and human care. The introduction of Bulletin board and social interaction functions will attract more students to use our AR campus travel platform and expand the coverage of our user community. Through real-time interaction and sharing, we can better establish connections with students on campus, promote communication and participation.

3.3 Creating a Campus Premium Tour Platform to Support Major Celebratory Events

This platform is committed to promoting the campus through a unique path, showcasing diverse campus culture, and

capturing the historical changes of the university. Teachers and students can contribute to introducing campus attractions through various content creations. In addition, real-time campus maps can be developed to customize according to the specific themes and styles of major celebrations. This map can provide information about event locations, schedules, and related activities, helping campus residents and external visitors understand and navigate event arrangements.

The platform can also provide real-time updates of activity layout, creating an immersive experience for campus activities. This allows participants to participate in campus celebrations even if they are not personally present. Compared with the traditional live broadcast on platforms such as Bilibili or Tiktok, the participation of "AR+Campus Map" can better integrate the real world with the virtual world. By providing a more authentic and immersive experience, it can attract more people, especially the younger generation, to actively participate in these grand celebrations.

4. Significance of The Subject

4.1 Deeply explore the application of AR technology on campus

Through the research conducted in this project, we have collected a considerable amount of recent literature and data on AR+ campus initiatives both domestically and internationally. We have analyzed these materials from various professional perspectives and combined them with practical circumstances to derive a new exploratory approach. In addition to literature research, we have conducted relevant surveys to gather opinions and suggestions extensively. This approach has rendered the research findings informative and practical.

Furthermore, our research provides theoretical recommendations for the digital inheritance of campus culture and the diversified development of the AR industry. By integrating theoretical insights with practical applications, we aim to contribute to the advancement of AR-based campus promotion and the overall development of AR technologies in the education sector.

4.2 Promote the output of campus culture and showcase campus humanistic sentiments

The "AR+ campus map" model breaks through the limitations of time and space and focuses more on the subjective experience of visitors, filling in certain gaps in the use of traditional methods for campus cultural promotion. Nowadays, users can immerse themselves in a virtual campus tour through their smartphones, which provides great convenience for school recruitment and external promotion.

The "AR+ campus map" not only integrates GPS positioning and navigation functions but also incorporates distinctive social features. This meets the social needs of university students and enhances the humanistic atmosphere of the campus. Users of the online virtual tour can also experience the rich human culture of Jiangcai University and witness the vitality of campus life.

4.3 Opening up new ideas for campus publicity in universities

The "AR+ campus map" model relies on different scenes to create unique visuals and corresponding introductions. It can vary according to different locations and times, making it highly promotable and replicable. Therefore, in the promotion of this model, other universities can integrate their own characteristics into the visuals presented by AR technology on the map.

As a pioneer in implementing the "AR+ campus map" model, Jiangcai University is paving the way for innovative campus selection strategies. This not only drives its own continuous development and updates but also provides valuable experience for other universities to learn from and replicate.

References

- [1] Xiao WY, Lv XL, Xue CQ. Dynamic Visualization of VR Map Navigation Systems Supporting Gesture Interaction[J]. ISPRS International Journal of Geo-Information,2023,12(3).
- [2] Ma C, Xu SX, Zhao WY, et al. AR campus planning sand table design based on virtual reality technology [J]. Journal of Shenzhen Institute of Information Technology, 2018,16 (02): 85-90.

[3] Lu X. Application Prospects of Augmented Reality (AR) Technology on University Campuses [J]. Computer enthusiasts, 2018 (06): 126+143.

[4] Pu W, Yang DQ. AR Camera for Civil Defense Education Entering Middle School Campus [J]. Life and Disaster, 2017 (05): 26-27.