AUGMENTED REALITY APPLICATION FOR RECOGNIZING RELIGIOUS BUILDINGS IN INDONESIA

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ABSTRACT

The development of Augmented Reality (AR) technology opens up new opportunities for interactive information delivery, particularly in the field of three-dimensional education. Indonesia has a diverse range of religious buildings, such as mosques, churches, temples, monasteries, and shrines, rich in historical and cultural value, yet literacy regarding this diversity remains low among the younger generation. This application has three main features. First, a markerless 3D religious building search feature with plane detection, complete with instructions, scoring, and correct/incorrect feedback. Second, the 3D object display feature displays information such as building descriptions, activity schedules, and prayer times, retrieved from Firebase Firestore, Realtime Database, and external APIs. Third, the markerless AR quiz feature presents five questions for each type of religious building, complete with a timer, scoring, and question data storage in Firestore. The use of AR Foundation technology in Unity allows virtual objects to be stably placed on a flat surface without markers. Firebase integration facilitates dynamic updates of data such as religious schedules and quiz questions without requiring app updates. Test results show that the app runs well on ARCore-enabled devices, the AR objects display stably, and all features function as needed. This app is expected to become a more modern and immersive learning medium and help improve users' understanding of the diversity of religious buildings in Indonesia.

Keywords: Augmented Reality, Markerless AR, AR Foundation, Firebase, Religious Buildings, Unity, AR Quiz.