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E-murtishala: The Online Idol Selling Website using Augmented Reality

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ABSTRACT: Emurtishala , initiative, leverages Augmented Reality (AR) to enhance experiential learning and engagement in various domains, including education, training, and tourism. This project integrates AR technology to create immersive environments that transform traditional learning methods, enabling users to interact with digital content overlaid on the real world. The application utilizes advanced AR techniques to provide interactive simulations, visualizations, and contextual information, making complex concepts more accessible and engaging. By fostering an interactive experience, Emurtishala promotes active participation, improving retention and understanding. Preliminary studies indicate that users exhibit increased motivation and satisfaction compared to conventional learning approaches. The initiative also explores the potential for AR in cultural heritage preservation, allowing users to visualize historical events and artifacts in situ.

KEY WORDS: Augmented reality, Virtual reality,

I. INTRODUCTION

Augmented Reality (AR) is a rapidly growing field that merges virtual elements with the real world, creating interactive, three-dimensional experiences in real time. It has gained widespread attention due to technological advancements and is being applied across various industries such as gaming, education, healthcare, architecture, and manufacturing. Head-Mounted Devices (HMDs), which can be worn as glasses or helmets, are key to enabling AR experiences. There are two main types of HMD technologies: Optical See-Through (OST) and Video See-Through (VST). OST displays overlay virtual content on a transparent screen, which is mixed with the real world, though they can suffer from issues like latency and environmental lighting affecting color visibility. VST displays, on the other hand, capture real-world images via a camera, which are then combined with virtual elements and displayed on a screen. While VSTs offer better control over visual quality, they are more prone to inducing motion sickness compared to OST displays. Emurtishala is an innovative platform designed to revolutionize the way we experience learning and engagement through the power of Augmented Reality (AR). As technology continues to reshape various aspects of our lives, the educational landscape is no exception. Emurtishala harnesses AR to create interactive, immersive environments that bridge the gap between theoretical knowledge and real-world application. Traditional educational methods often struggle to captivate learners and facilitate deep understanding. Emurtishala addresses this challenge by overlaying digital content onto the physical world, allowing users to visualize and interact with information in dynamic ways. This approach not only enhances comprehension but also promotes active participation, fostering a deeper connection with the subject matter.

II. LITERATURE SURVEY

1. Text readability in augmented reality: a multivocal literature review., Maxime Cauz, Antoine Clarinval, and Bruno Dumas, 2024

In this work, the author focused on Readability Factors: Identified key factors affecting text readability in AR in the real world. Adaptive Systems: It is based on real-time environmental conditions and user preferences.

2. Waveguide holography for 3d augmented reality glasses. Nature Communications, Changwon Jang, Kiseung Bang, Minseok Chae, ByoungHo Lee, and Douglas Lan man. 2024 .

In this paper, the author proposed a Waveguide holography provides high-resolution, bright, and clear 3D visuals in a glasses. Explore the application of waveguide holography in various AR use cases beyond glasses.

3. Usability and user expectations of a hololens based augmented reality application for learning clinical technical skills. Virtual Reality, Paula Escalada Hernandez, Nelia Soto-Ruiz, Tomas Ballesteros Egues, Ana Larrayoz Jimenez, and Leticia San Martin Rodriguez.2024

Users found the AR app intuitive and engaging ,enhancing learning and improving the retention of clinical skills. Add real-time feedback, detailed simulations, and advanced tracking to enhance the learning experience.

4.Virtual Augmented reality and learning analytics impact on learners and educators: A systematic review.”, Asmaa Sakr Tariq VR and AR increase engagement and motivation, helping students understand complex concepts. It assess the long-term impacts of VR, AR, and learning analytics in various educational settings.

5. Hacer Ozyurt, Ozcan Ozyurt., “ Decoding educational augmented reality research trends: a topic modeling analysis. Education and Information Technologies, 2024

Key research topics and themes in educational AR have evolved, with a notable increase in publications in recent years. Explore AR’s impact on specific educational out comes and learner demographics, along with conducting longitudinal research to assess its long-term effects.

III .PROPOSED METHODOLOGY

The proposed system for Emurtishala integrates Augmented Reality (AR) technology with a user-friendly platform designed to enhance learning experiences across various do mains. By creating interactive and immersive environments, the system aims to engage users more deeply and promote better understanding and retention of information.

A. Architecture

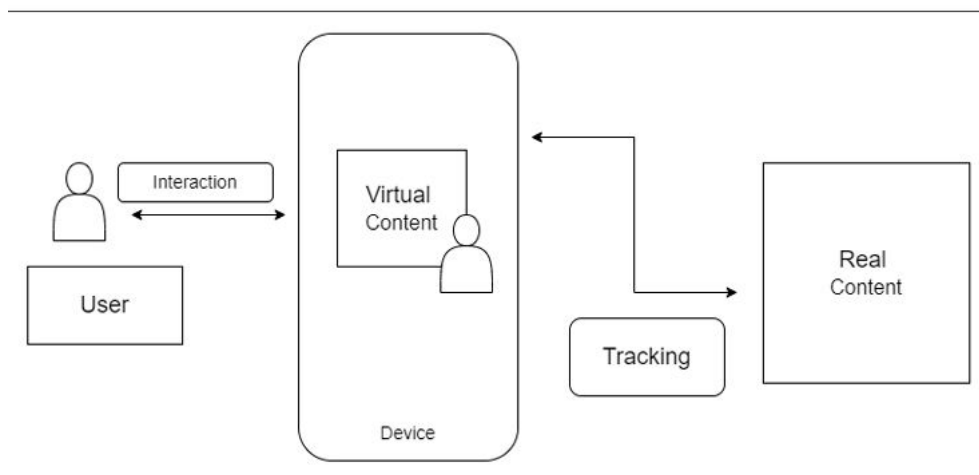


Fig1

Key Components:

a. User

- Interaction with Virtual Content- The user interacts with the device to experience the virtual content overlaid on the real-world environment.
- Personalized Dashboard: Users can track their progress, access favorite content, and receive tailored recommendations based on their learning patterns.

b.Device:

- **AR Content Delivery:** This could be an AR device like a smartphone, tablet, or AR glasses. The device serves as the platform where the virtual content is displayed. It detects both the real-world environment and user input.
- **Virtual Content:** Virtual content in AR often responds to user actions or changes in the environment. Users can manipulate virtual objects by touching them on a screen, using gestures or even voice commands.
- **Dynamic and Real-Time:** AR systems update virtual content in real time, adjusting as the user moves or interacts with their surroundings. This requires precise tracking of the user's position and movements.

c.Tracking:

- **Motion Tracking:** Motion tracking allows virtual objects to stay in place relative to the real-world environment.
- **Object Recognition and Tracking:** In object tracking, the AR system can recognize and track specific objects in the real world. Once the object is recognized, virtual content can be overlaid on it, and the content moves or scales appropriately as the object changes position.

d.Real Content:

- **Dynamic and Context-Sensitive:** AR systems often take into account the real world context to make the experience meaningful and responsive.
- **Environments:** The user's environment, whether it's indoors or outdoors, forms the spatial context for AR experiences. In AR gaming, real parks or streets can become play areas where virtual objects or characters appear.

B. Augmented reality conceptual architecture

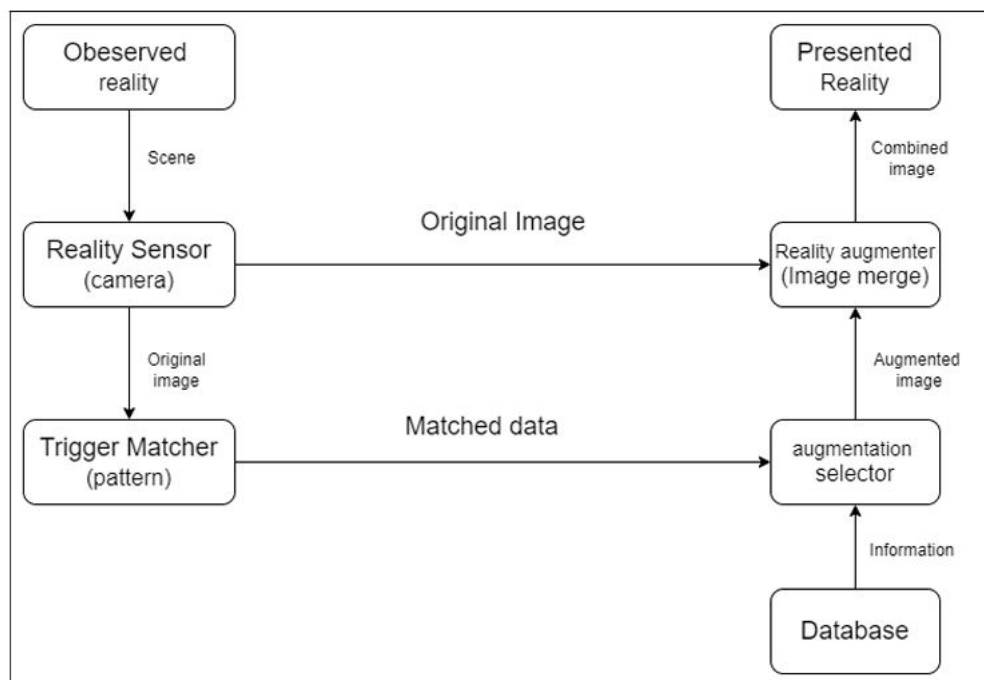


Fig2. Conceptual architecture.

System Architecture: Description of the components and their relationships:

a. Client-Side:

- **Mobile Application:** The primary access point for users, available on both iOS and Android, equipped with AR capabilities.
- **Web Portal:** An additional interface for educators to manage content, analyze student performance, and facilitate community discussions.

b. Server-Side:

- CloudStorage: Secure storage for user data, content, and analytics, allowing for scalable access.
- Content Management System (CMS): A backend system for managing the creation, organization, and updating of educational materials.

c. Key Component:

- Observed Reality: This represents the real-world environment or scene that the AR system is sensing and augmenting. It includes the physical world that is captured by the AR system. (e.g., a camera)
- Reality Sensor (Camera):The reality sensor refers to the hardware (such as a camera)that captures an image or scene from the observed reality. This original image is what the AR system will use as a basis for overlaying virtual content.
- Trigger Matcher (Pattern):The trigger matcher detects specific patterns or features in the captured image. These triggers (e.g., markers, objects, or spatial patterns) are compared with data in a database to identify points where virtual content should be added. When a pattern is matched with data from the database, it sends the matched data to the next stage.
- Database:The database stores information about the patterns or objects the AR system recognizes. This can include 3D models, animations, instructions, or other virtual content that is triggered when a match is found. When the trigger matcher finds a match, the augmentation selector retrieves the corresponding virtual content from the database.
- Augmentation Selector: The augmentation selector chooses the appropriate virtual content or augmentation based on the matched data. This content will then be overlaid onto the original image.
- Reality Augmenter(Image Merge):The reality augmenter is responsible for merging the original image (the real-world scene) with the selected augmented content. This produces the augmented image where virtual objects are integrated into the real-world scene.
- Presented Reality: The presented reality is the final output seen by the user. It is a combined image of the real-world scene and the virtual content, creating an augmented reality experience. This is the augmented view of the real world, where both real and virtual elements are displayed together

IV.CONCLUSION

In Emurtishala represents a significant advancement in educational technology, utilizing Augmented Reality to create a more engaging, interactive, and effective learning environment. As we delve deeper into the capabilities of this platform, we envision a future where learning is not only informative but also deeply immersive and enjoyable.

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Appendixes, if needed, appear before the acknowledgment.

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