

AN EXPLORATION OF THE PROSPECTS OF AUGMENTED REALITY AS A GIANT LEAP IN E-LEARNING

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Abstract: Augmented Reality is a cutting-edge development in the electronics commercial enterprise. It overlays audio, visuals and other sense improvements from computer screens on top of real time circumstances. Augmented Reality rises much above the stationary graphics technology of television, where the obligatory graphics remains unaffected with the perception. Augmented Reality systems apply visuals to each scene or angle and align with each advancement of the employer's head and eyes. Expansion of the required technology for augmented reality techniques is proceeding even now inside the research laboratories of universities and sophisticated enterprises. It is estimated that by the ending of this era, the initial machine-made augmented reality systems will smash into the marketplace. This paper gives an impression of the fundamental features of Augmented Reality (AR) and the main perceptions of this technology. It portrays the chief zones in which Augmented Reality is currently employed. It also discloses the contemporary as well as futuristic implications of Augmented Reality in education.

Key Words: Augmented Reality, graphics, technology, education.

I. INTRODUCTION

The world around us delivers an abundance of knowledge, which is quite complicated to replicate in a computer. This is demonstrated by means of the domains used in cybernetic atmospheres. Either these areas are very unsophisticated such as the surroundings generated for fun and amusements, or the system that can produce a more lifelike setting like an aeronautical simulator.

Augmented Reality (AR) is an emergent sphere in virtual reality investigation. An augmented reality system produces an amalgamated outlook for the user. It is a blend of the actual picture observed by the user and a simulated view created by the computer that enhances the scene with supplementary information. The enhancement can undertake numerous distinct styles. In all those functions, the augmented reality introduced to the user improves that individual's enactment in and awareness of the world. The eventual goal is to design a system such that the user would not be capable of discriminating between the actual world and the virtual augmentation of it. To the user of this vital system, it would look as if he/she is observing a particular real scene.

The term 'Augmented Reality' was invented by Thomas Caudell in 1990. Augmented Reality (AR) is a conscious view of a material, real-life situation, experienced either directly or indirectly, whose components are augmented (or complemented) by computer-generated sensual input such as illustrations, audio, video, or GPS data. It is associated to a broader ideanamed Mediated Reality in which an outlook of reality is reformed (probably even reduced more intensely than augmented) by a computer. Consequently,

the technology operates by enriching an individual's existing awareness of reality. On the contrary, Virtual Reality substitutes the material world with a simulated experience. Augmentation is conventionally instantaneous and relates to meaning with environmental elements like sports scores on television during a match. Making use of innovative Augmented Reality technology, the knowledge about the proximate tangible world of the user becomes collaborative, interactive and digitally manageable. Artificial information concerning the environment and its substances can be superimposed on the real world.

II. HOW AUGMENTED REALITY WORKS

Video games have been keeping us entertained for approximately over 30 years, from the time during the early 1970s. Computer graphics have turned out to be much more complicated since then, and gaming technology is throwing out the obstructions of photorealism. Nowadays, investigators and technologists are drawing out graphics from our television screen or computer display and amalgamating them into real-life settings. Augmented Reality, the state-of-the-art technology, diminishes the fringe between the real and computer-generated experiences by boosting what we see, hear, feel and smell.

On the continuum between Virtual Reality that generates engaged, simulated environments; and the actual world, Augmented Reality is near enough to the real world. Augmented Reality works by harmonizing visuals, sounds, tactile feedback and smell to the physical world, as it exists. Both video games and mobile phones steer the expansion of augmented reality.

III. APPLICATIONS OF AUGMENTED REALITY

Augmented Reality has numerous applications, and countless fields can progress from the utilization of this technology. It was first utilized for army, engineering, and medicinal applications, but was later applied to business and entertainment spheres.

APPLICATIONS OF AUGMENTED REALITY	<i>Archeology</i>
	<i>Architecture</i>
	<i>Art</i>
	<i>Commerce</i>
	<i>Construction</i>
	<i>Education</i>
	<i>Gaming</i>
	<i>Industrial Design</i>
	<i>Medical</i>
	<i>Military</i>
	<i>Navigation</i>
	<i>Office Workplace</i>
	<i>Sports and Entertainment</i>
	<i>Task Support</i>
	<i>Television</i>
<i>Tourism and Sightseeing</i>	
<i>Translation</i>	

1. Archaeology

Augmented Reality can be employed to assist archaeological studies, by enhancing archaeological characteristics on the present topography, facilitating archaeologists to devise inferences about location setting and arrangement. Another application given to AR in this area is the opportunity for users to reconstruct relics, constructions, or even landscapes, as they were previously present.

2. Architecture

Augmented Reality can help in envisaging construction schemes. Cybernetic illustrations of a building can be overlaid or superimposed into an authentic native vision of a property prior to raising the physical building there. AR can also be used within a designer's workplace, executing his/her views of animated 3D visualizations of the 2D drawings. Architecture exploration can be enriched with AR applications permitting users screening a structure's outer walls to virtually penetrate its walls, inspecting its interior substances and blueprint.

3. Art

Augmented Reality technology has facilitated disabled persons generate art by operating eye-tracking to convert the eye movements of a user into illustrations on a screen. An item such as a memorial coin can be devised so that when scanned by an AR-assisted gadget, it exhibits supplementary objects and levels of information that were imperceptible in a real world vision of it.

4. Commerce

Augmented Reality can improve product trailers such as permitting a consumer to view what is inside the packaging of a product without opening it. AR can also be used as a service to pick out products from a catalogue. Scanned imageries of products can trigger views of extra content such as customization choices and added pictures of the product in its usage.

5. Construction

With the persistent progresses to GPS precision, businesses are capable of using augmented reality to envision georeferenced representations of construction locations, underground constructions, pipes and cables using mobile devices.

6. Education

Augmented Reality applications can supplement a universal curriculum. We can superimpose text, graphics, audio and video into a learner's real time setting. Textbooks, flashcards and other educational reading materials can include inserted 'markers', which when scanned by an AR device, generate additional knowledge to the learner, depicted in a multimedia system. Students can work together with computer-generated replications of past occurrences, investigating and learning particulars of each noteworthy area of the event location. AR can support students in grasping Chemistry by letting them to envision the three-dimensional structure of a molecule and intermingle with a virtual model of it that appears, in a camera image, located at a marker held in their hand.

7. Gaming

Augmented Reality permits gamers to go through digital game play in an actual world environment. In the last few years, there have been several developments of technology, bringing about better and direct recognition of the player's movements.

8. Industrial Design

Augmented Reality can help manufacturing engineers to live through a product's design and function ahead of conclusion. AR can be used to envisage and adapt a car body structure and engine layout. AR can also be used to compare and contrast digital mock-ups with material mock-ups.

9. Medical

Augmented Reality can offer surgeons with evidence such as showing the blood pressure, the rate of heartbeat and the condition of a patient's organ, etc. AR helps a doctor to look inside a patient by merging one source of images such as an X-ray with another source such as video. AR can also augment observing a foetus inside a mother's womb.

10. Military

In battle, Augmented Reality can act as an interacted communication system that provides beneficial frontline information on a soldier's goggles in real time. From the soldier's perspective, persons and different things can be denoted with distinct pointers to warn of probable hazards. Virtual maps and 360° view camera imaging can also be delivered to help a soldier's routing and field viewpoint, and this can be communicated to military leaders at a distant command centre.

11. Navigation

Augmented Reality can enhance the efficiency of navigation tools. Information can be exhibited on a vehicle's windshield designating target pathways and meter, climate, topography, road conditions and traffic information in addition to warnings to possible dangers in their track. AR can permit bridge watch-standers to constantly check significant information such as a ship's speed and direction as moving through the bridge or doing other tasks.

12. Office Workplace

Augmented Reality can enable teamwork among dispersed team members in a work force through meetings with real and virtual members. AR tasks can comprise discussion meetings and brainstorming sessions using common visualization by means of interactive digital whiteboards, touch screen tables, distributed control rooms and shared design spaces.

13. Sports and Entertainment

Augmented Reality has become widespread in sports broadcasting. Sports and entertainment locations are bestowed with transparent and overlap augmentation through tracked camera feeds for improved watching by the audience. AR is also used in connection with football and other sporting events to show advertisements overlapped over the view of the playing area. It is also used in rugby fields, cricket pitches, swimming telecasts, tracking of hockey puck and comments of racing car performing and snooker ball tracks. AR can also augment theatre performances, wherein performers can permit listeners to supplement their listening experience by enhancing their enactment to that of other groups of users.

14. Task Support

Multifaceted tasks like maintenance, meeting, and operation can be streamlined by introducing added information into the field of view. For example, tags can be demonstrated on portions of a system to elucidate functioning guidelines for a mechanic who is executing maintenance on the system. Huge machines are hard to uphold because of the numerous structures or levels they have. With the use of AR, the employees can finish their work in a much simpler way as AR allows them to glance through the machine, directing them to the problem immediately.

15. Television

Weather visualizations were the primary application of Augmented Reality to television. It has now become usual in weather forecasting to exhibit full motion video of pictures taken in real-time from many cameras and other imaging devices. Paired with 3D graphics symbols and plotted to a common virtual geospace model, these animated visualizations comprise the first accurate application of AR to television. Augmented Reality is beginning to permit the next generation television audiences to intermingle with the programs they are viewing. They can position objects into a prevailing show and interact with these objects.

16. Tourism and Sightseeing

Augmented Reality applications can improve a user's involvement when traveling by offering real time information concerning a setting and its attributes, incorporating remarks made by prior visitors of the place. AR applications let travellers to experience recreations of ancient objects, happenings and locations.

17. Translation

Augmented Reality systems can translate foreign manuscript on signs and list of options and, in a user's enhanced view, re-demonstrate the text in the user's language. Verbalized talks of a foreign language can be interpreted and shown in a user's view as printed subtitles.

IV. CLASSROOM APPLICATIONS OF AUGMENTED REALITY

Users can participate in and generate Augmented Reality experiences of their own. Educationalists and essentially students can employ this open source tool to effectively bring their learning to life. The various applications of Augmented Reality in the classroom are as follows:

Homework Mini-Lessons: Through merely scanning a page of their homework, the students get access to a video of their teacher in the page, assisting them solve a problem.

Faculty Photo Wall: By arranging a presentation of faculty photos near the school entrance, people can scan the image of any teacher and see that the person comes to life, introducing himself or herself.

Book Reviews: Students record themselves providing a short review of a novel that they just completed, and then append that 'aura' (assigned digital information) to a book. Later, anybody can scan the covering of the book and straightaway retrieve the review.

Parent Involvement: By make a recording of parents giving short words of encouragement to their child, and assigning a trigger image (image that activate media when scanned by an AR-enabled device) to every child's table, enable the students to scan the image on their desk for virtual encouragement whenever they need to hear inspiring words from their parent.

Yearbooks: The means by which Augmented Reality can augment a school yearbook are boundless, from honoursto video profiles; from sports highlights to concert recordings.

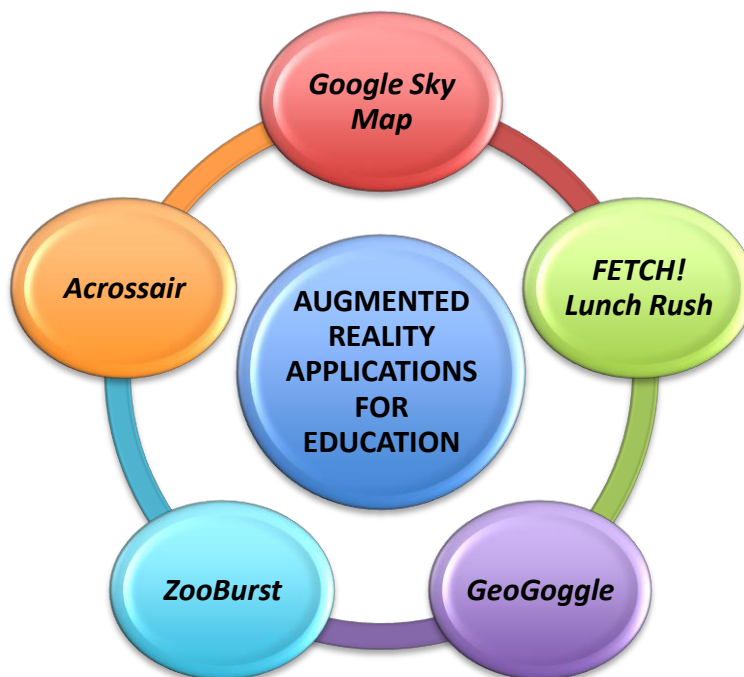
Word Walls: The students can record themselves giving the definitions to various vocabulary words on a word wall. Later, anyone can make use of the Aurasma app to make a peer pop up on screen, stating them the definition and applying the word in a sentence.

Lab Safety: By scanning the triggers placed throughout a science laboratory, the students can rapidly learn the different safety protocols and procedures for the lab apparatus.

Deaf and Hard of Hearing (DHH) Sign Language Flashcards: With Augmented Reality, flashcards of vocabulary words can include a video overlap that displays how to indicate a word or phrase.

V. FIVE TOP AUGMENTED REALITY APPLICATIONS FOR EDUCATION

The 5 best Augmented Reality apps for education are enumerated below:



1. Google Sky Map

This is an Augmented Reality app, which makes learning about astronomy stimulating and entertaining. Rather than searching for explanations of constellations in a book and then trying to spot them in the sky, Google Sky Map could be used to recognise stars and constellations directly using the camera on the smartphone.

2. FETCH! Lunch Rush

Lunch Rush is an Augmented Reality app to impart math skills to elementary students by means of using visualization. Designed in 3-D, the app places graphics over real-world surroundings on the camera in the smartphone. The app then instructs elementary students to add and subtract using real-life scenarios, which make allowances for visualization while resolving math problems.

3. GeoGoggle

GeoGoggle is an app which helps to obtain geography skills and estimating distances to definite destinations. Students can learn geographical measurements like latitude and longitude by applying GeoGoggle to practical settings.

4. ZooBurst

This is a well-made Augmented Reality app to assist elementary level students learn by way of visual imaging. With this app, students get to interrelate and become a part of a story. ZooBurst lets us take part in digital storytelling by scheming storybooks constituting 3-D characters.

5. Acrossair

Acrossair is a browser that can be used in real-life environments and in the classroom for learning and discussion. The browser can transmit apps that discover new uses of Augmented Reality. It helps to locate places near us and share our locations with others. Students can also produce interactive classroom projects, and join in interactive photo walls demonstrating wiki and multimedia on a classroom theme.

VI. DISCUSSION

Augmented Reality brings new dimensions to learning. Augmented Reality (AR) permits students and educators to unravel or create levels of digital information on top of the material world that can be observed through an Android or iOS device. Nearly all the people who interact with Augmented Reality initially have an amazing experience but are unsuccessful in reflecting its classroom applications. In our elementary school classrooms, we use AR to produce active learning experiences previously unimaginable, and in the process restate the learning space. Educators know that learning expands and accumulates, not solely through listening and reading, but also through interacting and creating.

VII. CONCLUSION

The notion of Augmented Reality was in existence long ago regardless of the truth that many users of mobile devices still regard it as an innovative trend. There are hundreds of augmented reality apps available for our smartphones. These apps can be used in day-to-day purposes and still more for educational purposes. Augmented Reality apps are altering the way educational content is presented, which aids to enhance classroom learning through interaction. These are only limited new augmented reality apps for education, which can revolutionise the appearance of learning in your classroom. Augmented Reality is a movement that is worth pursuing as novel apps and technologies are developed to make learning advanced, thought-provoking and entertaining. Even though there are numerous recent developments in AR, much work is going on. Using the available libraries can help application developments. Augmented Reality systems can be used virtually in any area or industry. The uniqueness of immediate information linked with augmented insight will guarantee the immense impact caused by augmented reality systems in the future.

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