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Integrating augmented reality technology to enhance student's learning in physical education

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Abstract--In practically every professional sport, the usage of linked computerized performances and monitoring components, data analysis, augmented and virtual reality are standard things. Augmented reality in sporting is being shaped by the interaction of devices and information and communication technology advances. Nevertheless, without analysis, the data collected are useless. In the sporting industry, scientists and researchers are becoming more and more essential to human operations. Even if a variety of data, technology, new measurements, and analytics are readily available on our life, most participants in professional sports do not yet show a strong interest in sports analysis. In this study, we explore augmented reality tools in sport activities and consider augmented reality tools to improve health conditions of students at the universities.

Keywords--Healthcare, Sport, Physical Education, Augmented Reality, Technology.

Introduction

The term of "augmented reality" (AR) refer to a concept and a development in the rapidly evolving disciplines of multimedia and artificial intelligence. This technique may make a traditionally flat or multiple item seem as three-dimensional and as integrated as possible with its surroundings (Billinghurst, 2002). According to Ibáez and Delgado-Kloos, 2018; Omarov et al., 2017), augmented reality (AR) is a component of environmental reality. It is capable of carrying out many forms of visual language, such as transferring shapes or pictures from a virtualized environment into the actual environment (Palmarini, 2018). Users of an augmented reality interface are able to view both the actual environment and virtual graphics that have been placed at real locations and on real objects. Unlike the virtual reality interface, which pulls users away from the actual world and onto the virtual screen, the augmented reality interface improves the experience of being in the real world (Ozdemir, 2018; Altayeva et al., 2016). The distinction between virtual reality and augmented reality, according to the framework, rests in the amount of user participation (Tzima, 2019; Altayeva et al., 2017). This program makes use of the fuzzy technique since the majority of the information pertaining to the incorrect agreement is unclear and one of the biggest talents that people possess is the ability to prepare information that is not perfectly efficient. In 1965, Professor Lotfi A. Zadeh was the first person to present the concept of fuzzy logic (Tzima, 2019; Omarov et al., 2020). The word "fuzzy" is described in the Oxford English Dictionary as being synonymous with hazy, unclear, poorly defined, and confusing. Expert systems or rule basis is what we refer to as a fuzzy system. The rules that are established up on a fuzzy knowledge base constitute the central component of a fuzzy inference system.

As a result, the implementation of significant from the perspective of biosemiotics Umwelt paradigm is used in order to carry out the methodical understanding of the potential of employing augmented reality (Knyazeva, 2014b; Stella and Kleisner, 2010; von Uexkull, 1909). This idea offers a comprehensively focused representation of a unique universe or a particular actuality of a form of life. According to von Uexkull, the declared reality (German: Umwelt) is expressed via the combination of the world of experience (German: Merkwelt) and the world of activity (von Uexkull, 1909). Therefore, during the course of its life, the body builds what is referred to as a "relevant zone," which is that particular piece of reality that seems to be of crucial importance for its perception and action. It has been taken into consideration to look at the level of quality and sincerity of the gymnast's training, as well as other quality assurance procedures. To ensure the quality of the instruction, one of the most involved components is to promote quality observation. That the students, grad students, and real training of college understudies, together with other offices, have established a framework for verifying the quality of intelligently taught material (Zhi & Nan, 2011).

How physical education course has become an increasingly urgent requirement is to promote individual growth and contemporary young adults' use of digital technologies in physical education teaching (Liu et al., 2012). This will allow for the provision of tailored physical education to students. New innovations include artificial intelligence and image processing technology, which emphasizes communication between instructors and students, as well as the communication

between educators. The key themes of media replication training programs have been expanded upon and more thoroughly discussed so as to provide higher-quality education [15]. Classes may benefit from the information extraction of association rules approach that is already available. It plays a significant role in the process of mining affiliation rules in a large scope exchange information base, which is essential for addressing practical challenges in a variety of domains [16]. Various administrative presumptions have been suggested as a result of the improvement that has been made to achieve the visual groupings of the digital technologies front line. To take into consideration and work together on the game are the aspects of sports culture and physical education, as well as clinical human science. Expand the Theory of Value, including the components that are still in use in the modern-day roundabout in the center [18]. In this research, we demonstrate application of augmented reality tools in sport education to increase of motivations of students.

Materials and Methods

The caliber of the teaching staff is an essential component in determining the results for students (Kin, 2021; Zulkifli & Danis, 2021; Omarov et al., 2016). Studying in physical education that is traditionally performed on the playing field or elsewhere outside of the classrooms may now be performed within the school without a corresponding reduction in the variety of learning resources available for physical education (MacWhinney & Leinbach, 1991). By using different forms of augmented reality based learning environment, educators in the area of sports may increase their own personal competency in the area of knowledge. Naturally, this has the potential to enhance the competency of sport instructors, which in turn will enhance other types of competency, including pedagogical competency, social competence, and qualifications.

Educational media for physical training that make use of the augmented reality tool may assist learners with disabilities for inclusive learning in gaining access to the same instructional content as other learners (Ginaya et al., 2020; Onalbek et al., 2013). Training resources for physical training that make use of the augmented reality tool will make it simpler for instructors of sport education to supply learning resources, will boost teachers' competence, and will deliver educational and sociological knowledge. In the meantime, pupils will be given the rights that they are entitled to have in the event that the weather circumstances are not favorable to learning. However, the issue that has to be asked is whether or not professors of physical education have the expertise and skills necessary to use augmented reality apps as an alternative in distant learning techniques. On the basis of this, the purpose of this research is to create a map of the capability of sport training instructors to master remote learning techniques via the use of augmented reality technology (Suryasa et al., 2019)

The "knowledge-based augmented reality maintenance support" test bench has thus been supplying information about the technique of wearing and is face of repair and replacement to the body in order to implement the transparent display (Kai & Liu, 2016;). This is done in order to prove the assertion. A significant portion of this paper, in terms of augmented reality with regard to staying in the mature virtual world behind the author at the time of writing (Xie 2020), has been

detailed by the author. The author discusses modeling, practical diagnostics, production, and route planning, as well as covers entertaining for augmented reality apps used in military settings. Additionally, the author follows the building of actual augmented reality systems, which has led to the emergence of two significant accuracy concerns (Leilei, & Huina, 2020). A kind of technology known as virtual reality technology simulates the environment of the actual world by using the most recent findings in science and technology. It does this by integrating many types of data into the computer, giving users the impression that they are immersed in the experience. The computer interface and the three-dimensional scene are its primary components. The typical human-computer connection is replaced with one that has a greater effect both visually and aurally. The concept of virtual reality did not start to gain traction until the 20th century.

Users who make use of this technique will be able to get the most authentic sensory and visual sensations possible while remaining in the comfort of their own homes thanks to virtual reality software. The technology behind virtual reality offers a lot of potential utility. To begin, it is capable of simulating the genuine surroundings as well as the real actions. When a person utilizes a virtual reality equipment, they are able to experience certain activities and behaviors that are not possible at regular periods. This technology not only has value from an entertainment standpoint, but it also presents opportunities for us to spread awareness about important safety topics. People may experience the tactics and stages that firemen use to put out a fire by donning virtual reality equipment, and they can also experience what it's like to get out of a burning building without being burned themselves. Second, the technology of virtual reality may be used in the field of education. For instance, when it comes to educational exercises, in order to comprehend the more vivid information and abilities that instructors and students desire to attain, it will not be possible to carry out some of those concepts because of the limitations that are imposed by the actual of circumstances. The third benefit is that it enables you to develop abstract thought, and virtual reality equipment may be used for training and modeling for an extended period of time. One will not be able to develop basic imagination by the hands-on actions and human production since it demands the ability to embody abstract ideas.

In his study, Al-Ansari (2017) only makes use of an effects on individuals, meaning that he employs the same marker for each and every item. Consequently, object identification has become less specific and more murky. Study that has been ongoing from Agatha and Darmawiguna (2017) augmented reality apps are built without employing markers, which would cause it to be difficult to recognize some things. Additionally, supporting resources for autonomous learning were also available at the time.

Results

Goal of this research is study of the impact of augmented reality on the competence of teachers and motivation of students in the field of sports and analysis of the impact of teaching and training activities on the development of spatial orientation of students.

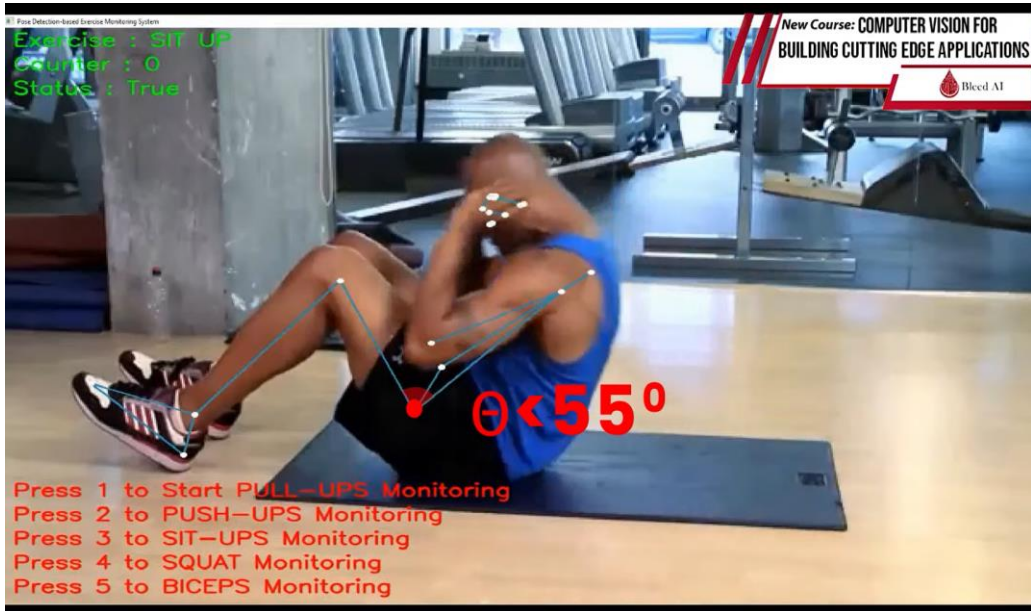


Figure 1. Exercise monitoring system

Figure 1 demonstrates doing exercise using augmented reality technology tools. This exercise monitoring system was proposed by Bleed AI (<https://www.youtube.com/c/BleedAI>).

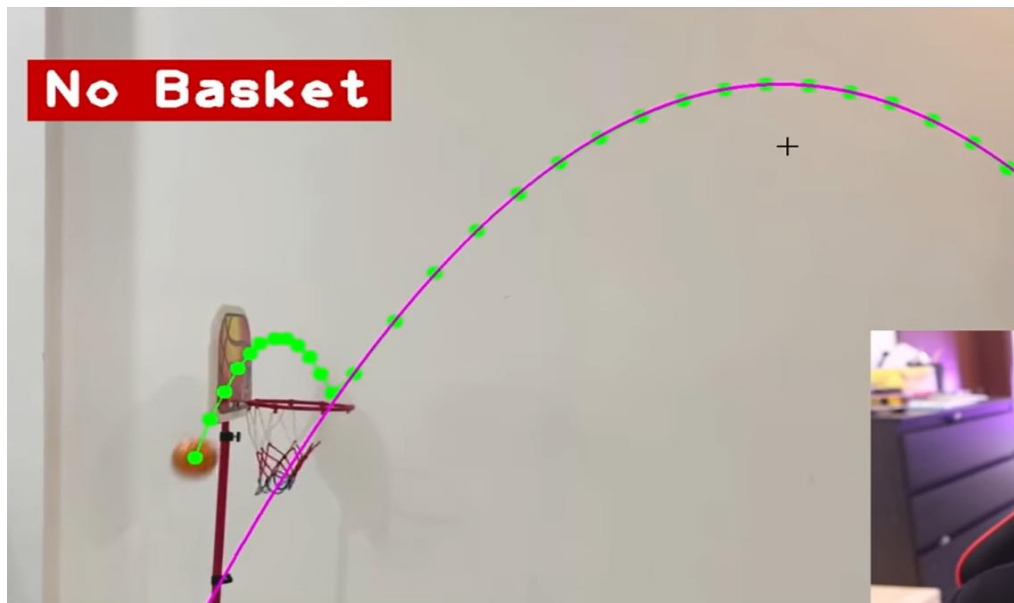


Figure 2. Augmented reality in basketball game

While live games, this display mode illustrates the plays and motions of the athletes and ball. It is meant to mimic how plays would seem when a trainer would typically sketch them for the coaches and players. Throughout ball control, players are additionally recognized by a moving photo of their name and number that seems to hang over them. Whenever a player makes a play that has a quantitative consequence, analytics are computed and presented above them using augmented reality visuals.

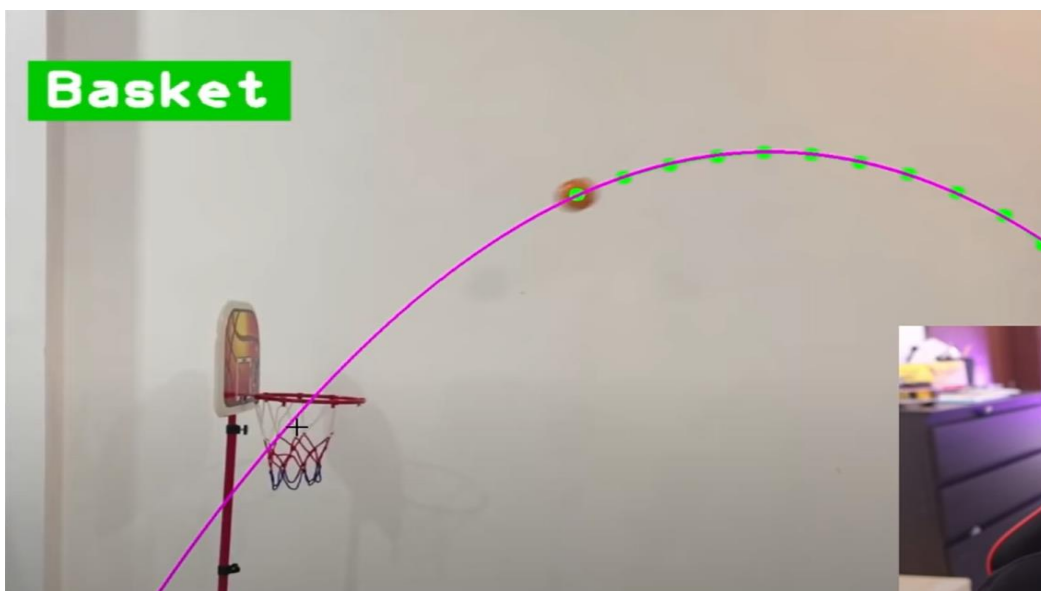


Figure 3. Augmented reality in basketball game

Figure 2 and Figure 3 demonstrate an application of augmented reality in basketball gaming. Using augmented reality tools, students can learn how to use and through a ball to the ring. The proposed augmented reality based techniques for sport motivating to do sport activities can be included in sport education and sport lessons. In the next part of our research we are going to apply these kind of technologies in sport lessons in the university and do pedagogical experiments considering research and control groups.

Discussion

A technique known as augmented reality allows for the real-time overlay of fake material onto the perspective of the outside world. The majority of augmented reality apps have traditionally been created for personal use on mobile devices, but more recently, augmented reality applications have also been created for industrial usage, as well as for building maintenance and visualization. In specialized Internet of Things scenarios, such as sports analytics, where digital devices are disguised in the environment to allow players to submit information on their athletic performance, there are fewer applications concentrating on employing augmented reality for realtime sensor information.

According to researchers, the philosophy underlying augmented reality is to increase the organisational space for augmenting the surroundings and circumstances and to provide psychologically rich experiences (S. Pato and D. Remillard, 2018). The environment around us becomes informal and digitally manipulable with the aid of augmented reality. Moreover, augmented reality makes it easier to add, remove, or modify real-world elements by enhancing users' perception of, and ability to comprehend, items and circumstances. The application of augmented reality in entertainment, workplace efficiency, phobia therapies, teaching, and human-computer interaction is also widespread (Brito & Stoyanova, 2018). In general, augmented reality is about enhancing our surroundings with digital content rather than simply using images.

Skill development and realistic sports situations may be carried out simultaneously with augmented reality. Additionally, technological enhancement could place less emphasis on a person's inherent qualities and more emphasis on their capacity to work with advanced technologies. This also takes the players' entertainment value and competition into account. Golf was used as an experiment by (Fery and Ponserre, 2001) to demonstrate how well skills from video games translate to the actual sport. (Witting, 2007) also shown that not all actual sporting events must be included into the gaming environment and that athletes may still gain from gaming just by watching. Small fields of vision may demand more cognitive burden, however specialized augmented reality displays may enhance efficiency while requiring less cognitive load.

Conclusion

Scientists are exerting a great deal of effort to develop more effective technology solutions to enhance the quality of human existence that is now available in every region of the world. These improvements are being made with the intention of bringing about a fundamental change in the sports and healthcare industries as well as simplifying the procedures that are now in place. We have provided a concise introduction to a number of augmented reality medical care and app options that are currently on the market in this post. The most current development plans in connection to the already existing medical technology stack as well as data processing techniques have been put forth, along with a detailed description of the overall scope of these plans. This essay's objective was to, to some extent, contribute to the continuation of growth by bringing awareness to a variety of unsolved issues that simultaneously include the need for increased security and impending challenges. This article also illustrated the relevance of augmented reality-based applications in the sports and healthcare sectors, which was backed by data on the present condition of the industry. In addition, this article provided an overview of the history of augmented reality. The engagement of a bigger number of stakeholders in the development process may be encouraged by the use of such apps in the later phases. In this study, we shown augmented reality tools for physical education.

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