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VIRTUAL AND AUGMENTED REALITY – DEFINITION AND SPHERES OF APPLICATION

In recent years, each of us has heard about incredibly fast progress in technology field. Two of the most interesting and most promising technologies that already have many fans and spheres of application are virtual and augmented reality.

Virtual reality or VR represents environment generated by computer that a person can interact with through their visual, auditory, and even tactile perception [1]. This reality can simulate both the influence and the reaction to it. Usually this environment is used to simulate the real-world objects with physical laws (such as gravitation, properties of water, collision etc.). Currently it is increasingly used for entertainment purpose, especially computer games. Nevertheless, sometimes laws of physics and rules of real life are ignored, and users are allowed to do more than in real life.

For today, there are two main types of VR-systems. The first one represents a room with environment projected on the walls. For example, cave automatic virtual environment, better known as CAVE, is an immersive virtual reality environment where projectors are directed to between three and six of the walls of a room-sized cube. And the other, which is the most popular for today, is a headset that contains a display and headphones. For the purpose of interacting through tactile perception special VR equipment is used – gloves usually combined with headset.

Besides gaming, VR is used in numerous spheres of human activity. These include the following: training, watching a video. Training such specialists as pilot of a plane, dispatcher, rescuer, astronaut with real flights and operations is really expensive and sometimes dangerous for life. That's why companies use special VR equipment – simulators, which enable training specialists with lower expenses and risks to life [2]. Watching videos with VR headset gives user an opportunity to immerse in the atmosphere of this video. Games, that use virtual reality allow a person to take their game character`s place. VR technologies have already penetrated in versions of such successful games as The Elder Scrolls V: Skyrim, Star Trek, Doom, Borderlands 2 etc. Also, there a lot of games that simulate races, flights, music instruments, sport games, etc.

Unlike virtual reality (environment that is fully generated by computer), augmented reality, or AR, is a technology that extends real world by augmenting it with some computer-generated objects or information, which also interacts with a user through their visual or auditory perception [3].

These days the most popular items, in which this technology is inserted, are glasses and smartphones. The great example for showing AR inserted in glasses is Google Glass. These glasses are equipped with a built-in computer with display, which enables a user to see some information right before glasses. Nowadays, these glasses have built-in virtual assistant developed by Google which provides you with an

opportunity to perform particular tasks just by voice command. In smartphones AR uses their camera to get and display information or objects, generated by special software.

Where can it be used? In architecture and design AR can help visualize some projects, by inserting computer-generated objects to real-world view from user's smartphone camera. In educational and tourist purposes it can help people by displaying additional information about objects, buildings and monuments, captured by camera of a smartphone. Like VR, AR is also extensively used in computer games, where a player needs to interact with virtual objects or other players etc.

To sum it up, virtual and augmented realities have already become excellent helpers in our lives. In future the sphere of their application will be extended as they have potential of making human lives easier, safer, more interesting and exciting.

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