Chapter XVIII

The Future of Augmented Reality Gaming

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Abstract

Entertainment systems are one of the successful utilisations of augmented reality technologies to real world applications. This chapter provides my personal insights into the future directions of the use of augmented reality with gaming applications. This chapter explores a number of advances in technologies that may enhance augmented reality gaming. The features for both indoor and outdoor augmented reality are examined in context of their desired attributes for the gaming community. A set of concept games for outdoor augmented reality are presented to highlight novel features of this technology.
Augmented reality (AR) in entertainment computing is a well-established area of investigation, and may one day prove to be an early “killer app” for this emerging form of technology. AR gaming may well succeed where Virtual Reality gaming had only a limited success. The three features of AR that enable it to support more novel forms of computer games as compared to VR versions games are as follows:

1. AR only requires a limited amount of the user’s field of view to be rendered. The vast majority of the user’s view is the physical world, and only the introduced game pieces require computer generated graphics. In VR, the entire visual world (i.e., the virtual world) must be rendered, causing the users to always be left with the feeling of existing in a synthetic world.

2. The ability to view the physical world allows the users a better sense of where they are and who is around them. Being able to see the physical world allows users to move freely in the combined physical and virtual world with the ability to view and avoid obstacles such as chairs, trees, and other people. The ability to view other people, albeit without being able to view the other person’s eyes, is a powerful visual cueing mechanism for collaborative games. For example, aiming a physical ray gun and virtually shooting at someone instead of an avatar is much more personal. Full body cues such as waving one’s hand is more naturally supported in an AR environment.

3. Finally, the physicality of moving in open spaces is appealing to users. The ability to move around in large or small areas allows the users to understand and experience the game at a more primordial level. The ability to physically walk over to a position is more intuitive than the use of keyboard or mouse control.

AR gaming requires additional computer hardware support. In particular, self-contained position and orientation sensors that are rapid to setup and install. AR technologies could be employed in the entertainment industry for theme parks, video arcades, or special purpose arenas (for example paintball or laser tag). This chapter will focus on the home use of AR gaming, as I believe this will have the largest impact for society.

The overall objective of this chapter is to provide an overview of my vision of the future of AR gaming. The chapter starts with an exploration of what advances in technology would enhance AR gaming, and in particular highlighting the required technology advances required to bring this form of game to life. The chapter then goes on to examine indoor AR games in context of their desired attributes for the gaming community. Augmented reality is currently in a number of different form factors based on the following:

1. Whether it is played indoors or outdoors
2. The type of display—head mounted displays, handheld displays, or projector-based displays
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