Chris Samuelson

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Computer Graphics in Video Games

Computer Graphics and Video Games have long been partnered together, and likely have each contributed to the other’s successes. Games provide some motivation for innovation in graphics; and great graphics provide inspiration for the creation of new games, and create a striking image for any particular game, helping in its sale. The appearance of a game, and how much it impacts the game has been debated, particularly over the last decade as graphical fidelity has increased. Today computer graphics are capable of looking downright tangible, if not realistic. However this realism requires a long pre-rendering process, something that isn’t acceptable for real-time games. This is an interesting situation that they sit in, between a desire for beautiful visuals and real-time rendering. How graphics and games have reached this point, why it matters, and what impact it has had, as well as what tools games use from graphics will be discussed.

Most any game that is considered to be one of the first has had some kind of graphics. Games have been able to persist using only text and ‘ascii-art’ to represent the state of a game, but quickly the desire to present ‘real’ graphics overcame, and simple objects started to appear on the screen. The use of these new graphics was a great advancement in the area of games, now video games. Computer Graphics present a situation to the player in a way that is much easier to understand.

Computer graphics is a huge factor, and a huge field in Video Games, and is, for some people who play, a sticking point for determining the quality of a given game. Graphics in video games has changed drastically over time from basic geometry, to semi-realistic. The existence of the games industry has made it possible for more significant development in the field of graphics, and vise versa, making games more visually appealing. Video games have made notable use of computer graphics rendering effects such as anti-aliasing and anisotropic filtering, and bloom or HDR, which can have a strong impact on the appearance of the rendered images. Of course there are many other features provided by graphics hardware and their APIs, but these are the most noticeable. The real debate about these features is whether or not they have any impact on the game itself. Clearly they have little effect on end gameplay, but some effect on how the player perceives their experience still remains. The significance of this varies, and largely is unaffected by the graphics technology used.

The history of Computer Graphics is short in the scheme of things, but spans into the early 60s with the SAGE computer. Even here some games were made and played; in fact the SAGE was intended as a flight simulator, something that necessitates graphics, and is similar in nature to a game. The use of vectors and matrices was quickly realized in the 70s, spawning the need and use of more dedicated graphics hardware. The idea of dedicated graphics hardware is a modern necessity for visually appealing graphics. The 70s was even the beginning of the arcade era, when one could find arcade game cabinets in a commercial store to play. Most of these games display simplistic graphics, that were considered impressive at the time. The first game consoles were capable of basic 2D images.