

THE DEVELOPMENT OF VISUAL ASPECTS IN VIDEO GAMES OVER THE YEARS

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Abstract: This report investigates the importance of creating a realistic environment in order to create an immersive world in digital games. The discussion will start from the history of Digital game development until now, discussing on the limitations of gaming consoles from time to time, and how game designers nowadays keep pushing the boundaries of the visual aspects of their game. Then focusing the discussion on the technical and art aspect of digital game design. By doing the analysis in this report, we can conclude that there are several reason that affects the visual quality of video games, such as the technology of the game console, the limitation of game engine, and also the skill of the game artist itself

Key words : Video Games, Digital Games, Game Console, Environment, Game Engine.

Introduction

Video games development has been grow-ing rapidly over the years. From a simple pixel based 2d games such as 1972: Pong (Ralph Baer) to nowadays game that offers not just a simple gameplay, but also to the point where it becomes a form of en-tertainment as books, movies, recordings, and even television. Video games attracts so many players, because now the play-ers as the user gets to interact directly

with the product itself. As video games become more and more intricate, play-ers are get-ting more involved in the world of the game, for example in Role playing games (RPG) there are many things for the players to do, one of them is exploring the world. Over the recent years, game devel-opers keep pushing the boundaries into making a very im-mersive world inside of the game. Luke Ahearn in the book 3D Game Environ-ment, says that video games must look good and run well, which means that

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even though game artist main job is to create an impressive looking world inside of the game, they have to keep in mind about the limitation of the game console. Game artist should consider many things, and with the game programmer, they have to optimize things. We can tell a game performance by looking at the game frames per second (FPS). And luckily for game developers nowadays, the possibilities to make an amazing looking game art, while it is still working really well in the console has become wider, due to the fact that game consoles nowadays or next-gen game consoles such as Sony playstation4, Microsoft xbox one, and Pcs become more and more powerful in specification.

Game Engine and Assets Creation

Michael E. Moore in the book "Basics of Game designs" (2011) said that most game developers rely on commercial game engine to save cost. These game engine are licensed from the company that created the engine. The cost of leasing the game engine might be expensive, but most commercial game engines such as Unity, Epic Games, and Unreal engine comes with tools to animate 3D models, create cutscene animations, write scripts to define entity actions, handle the audio requirements, and

much more. It does not include a 3D graphics program to build the models, so artists have to use 3ds Max, Maya or another program to build the original models to import into the game Engine. Having said that, Luke Ahearn in the book "3D Game Environments: Create Professional 3D Game World" (2008) also said that, Game artist should pay attention on textures and Polygon budgets. Making games 3D assets in game has to follow some rules, we have to remember that game engine also has limitation, so if game artist wants the game to look visually appealing and still runs smoothly, Game artist has to be efficient with the 3d modeling.

Environment Lighting in 3D Games and CG

In the book "Digital Lighting and rendering" (2006), Jeremy Birn the process of lighting an environment needs a really good sense of how lighting works in the real world. Naturally all lighting conditions at day and night will certainly be different. Another key thing to remember is the weather conditions

Analysis

In light of the theories discussed, we have a better understanding of how the visual quality of an environment in a game is heavily affected by the li-

mitation of the game console itself. And also the ability of the game artist to apply how lighting works in real world to the game environment. In this chapter we are going to have a further look at these theories by observing excerpts of well-known games from different consoles generation as examples.

In this analysis, we will only focus on different generation of Sony Playstation consoles which are Playstation 1 and Playstation 4. The game that I've chosen for playstation 1 is Crash bandicoot 3 : warped (Kurasshu Bandikuu 3: Buttobi! Sekkai Isshu in Japan) is a platform game created and developed by Naughty Dog and was released on November 4, 1998.

Meanwhile for Playstation 4 I've chosen The Last of Us, It is a third-person survival horror action-adventure video game developed by Naughty Dog and published by Sony Computer Entertainment. It was released on June 14, 2013 and August 1, 2014. Firstly we will discuss about Crash Bandicoot 3: warped In-game visual. I chose a jungle/forest environment.



Figure 1 . Crash Bandicoot 3 : Warped
Gameplay
(http://img.gamefaqs.net-screens/5/1/2/gfs_50233_1_10.jpg)

In this image we can see that the use of 3d modeling is really efficient, by looking at the 3d model of the house, we can see the rough edges of the roof and the frame of the door. The use of texture is also limited. We can see it clearly by the pattern of the texture. The texture that being used is a Tiled texture, by doing this, the game artist can easily tiled a low res texture to cover a wide area of polygon. Due to the limitation of the game console, this visual achievement has to be greatly appreciated. By looking at the lighting condition of the environment, we can clearly see that although it tries to imitate the real world situation, the overall visual is still unrealistic and basically flat.

Secondly we will take a look at The Last of Us. For this example I also chose jungle or forest environment.



Figure 2 . Last of Us Gameplay
(<http://io.wp.com/gearnuke.com/wp-content/uploads/2014/07/the-last-of-us-remastered-ps4-2.jpg>)

By looking at the image, we can see a huge contrast between this game and the previous one. In here the foliage is highly detailed, we can see each individual leaves and grasses perfectly, and noticeably we can also see the existence of fog or atmospheric light, which means that even though the game artist has some limitation over what they can do for the game, but with the technology of the latest console, it allows the game artist to freely apply their knowledge of modeling and also lighting.

For the texture of the model, we can't really tell if it is a tiled texture or not, because of the level of precision of the game engine to calculate the lighting and the material of the model.

Impact

After we investigate these two games, we can easily predict that in the future, the visual quality of Video games will be

increasing as it follows the technology that is available. And we can see that by looking at the image quality of recently released games such as The Witcher 3 : Wild Hunt (2015) and Metal Gear Solid V: The Phantom Pain (2015).



Gameplay
(http://static3.gamespot.com/uploads/original/1365/13658182/2624268-the_witcher_3_wild_huntcrossroads_1407869449.jpg)



Figure 4 . Metal Gear Solid
(http://static1.gamespot.com/uploads/original/1365/13658182/2663560-metalgearsolidv_phantompain_tgs_mgstpp_tgs_23_web.jpg)

Looking at these we can see what differences 1 year can make in video games visual quality. This is already become

a trend today, that video games tend to imitate real world as real as possible.

Conclusion

Based on the analysis that has been done there are few aspects which affect the visual quality of a game. One of the most important is of course the limitation of the game console, recent generation console allows the game artist to maximize their ability to create great art because of the less limitation it has. The other thing is also the skill of the game artist, with knowledge of art and also how lighting works in the real world, Artist will be capable of making a better looking visual in a game. Simply put it this way, If the world gives game developers Higher technology, they'll build more graphically impressive games. With higher technology it pushes the boundaries and limitation of game artist to create a more visually appealing video games, not just the art aspect of it