Chapter 17
Rendering and Video Games

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ABSTRACT

We present a study of the triad rendering computer made static and/or dynamic images, video games and adult users who interact with a personal computer. Besides, there is a diachronic study of the basic components to design the virtual 3D characters which are included in the video games. The link of the evolution of the interactive games is also analyzed and especially the interactive design characteristics related to the content, navigation, structure and layout. Finally, a table is presented with those components stemming from the rendering of the scenes for the video games, which motivate their fruition by the adult users.

INTRODUCTION

The video game industry keeps on manufacturing versions of its larest novelties in DVD support, because there are adults users who prefer to interact with them through the computer (Edvardsen & Kulle, 2010). Some of them, from the keyboard, that is, without using the joystick. Some of the psychological motivations from the point of view of the user are due to the fact that the videogames make them live again the fiction of past times, that is, childhood, adolescence or youth, where they interacted directly from the personal computer at school or in the home. Users who have interacted with videogames such as Myst, Tomb Raider, SimCity, The Sims, Resident Evil, Tetris, Pac Man, etc. (Edvardsen, & Kulle, 2010). At the moment of the pauses while they learned the use of the applications aimed at office automation such as the words processors, spreadsheets, databases, etc., that is to say, WordStar, WordPerfect, Lotus 1-2-3, Dbase II or rather the programming in BASIC, Cobol, Fortran, Assembler, etc. In other

words, they were born in the era of audiovisual communication, like television and cinema, they were immersed in the process of metamorphosis from the analogical information to the digital one, where the pastime with the traditional games (chess, checkers, cards, minesweeper, etc.), and some of them were already included in the options of the operative systems such as the versions of Windows of the 90s (Cipolla-Ficarra, 2010).

The current chapter starts with a state of the art and the evolution of rendering from the graphic software and the hardware in the PCs, to know the essential components for the emulation and simulation of reality, through graphic computing. Later on we research the basic principles of the three-dimensional characters and their behaviour, investigating in the first studies carried out by the Thalmann couple and some of the basic principles for 3D modelling of the virtual characters. Then is examined the evolution of the PC interactive videogames considering them from the point of view of communicability and user experience design (UX). The categories of interactive design are also considered such as the content with the narrative; the structure and the transformations with the passing of time, among hypertext, multimedia, hypermedia, navigation and the immersion of the user in the different contexts or scenes, etc. All these elements have allowed to draw up a table with those elements of the rendering which the adults users regard as positive to motivate them in the fruition of the contents, irrespective of the way in which they have been structured. Finaly, there are the sections of learned lessons and conclusions.

RENDERING: STATIC AND DYNAMIC FRAME

Traditionally, rendering is regarded as the process of generating a static image (frame) or dynamic (a set of frames) in a video format through the calculation of the lightening of the components in a 3D and/ or 2D (Cipolla-Ficarra, 1996). In other words, generating an image from the mathematical description of the scene in the scene 3D and/or 2D, through algorithms which define the color in each pixel of the digital image. The description refers to a set of data related to the geometry 2D and/or 3D from the point of view of the observer, the optical characteristics of the surfaces, visible to the observer, illumination, etc. (Newman & Sproull, 1979: Soh & Tan, 2008; Furtado, Santos, & Ramalho, 2011). The term calculation implies mathematic equations for the simulation and emulation of reality, in natural weather phenomena such as fog, snow, rain, and so on which are included in the static or dynamic image. The mathematics used for the rendering includes: the Montecarlo method, lineal algebra, calculation and numerical analysis, the digital analysis of signals, etc. The set of algorithms make up what is colloquially known in computer graphics as "the engine" of the rendering. Generally, in relation to the engine a commercial software is capable of making the calculation of the illumination, for instance, in more or less time. Aside from the hardware used, the final quality of the static and/or dynamic images depends on them, with a high final quality, which makes currently the users of interactive systems unable to tell apart quickly a digital photograph of reality or an image made through geometric objects in 2D or 3D in the computer. Now at the end of the 20th century, when in the stage previous to the definitive creation of the scenes were completed (representation, wireframe), the stage called rendering (Newman & Sproull, 1979), that is, were included the texture bitmap, lights, bump mapping, and so on giving as a result a final image or frame. In the case of the computer animations, with cinematographic purposes or not, there was a high number of frames.

These images obtained from the rendering can be classified alphabetically and in relation to a set of visible phenomena in:

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