What is a Video Game?

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Abstract

This report introduces the fundamental concepts of video game, including its definition, structure, loop, as well as the brief history. Then comes with the basic development process of the game and game programming sub-disciplines. Finally, it talks about game engines, and the APIs and SDKs in game programming.

Keywords: Video Game, Game Development process, APIs, SDKs, Game engines

1 Introduction

A video game is a game running in electronic devices such as TVs or computers that has human interaction and user interface to generate visual feedback[Baer 1972]. Game may be seen as a form of art, but it has an interactive medium that can perform various kinds of interactions with people, which makes games differ from movies and other art forms. Also, a game is a complete software, which can be built, installed and run on certain platforms (e.g. Sony PlayStation, Xbox One).

2 History of Games

- 1972: Pong, is one of the earliest video game using simple 2D graphics. It just simulates table tennis. Player controls the paddle in the left and compete against either the computer or another player with the right paddle.

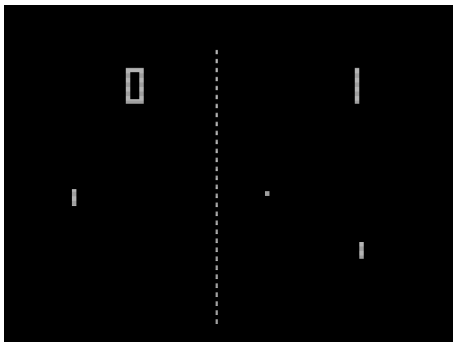

Figure 1: *Pong- the very first sports video game.*

- 1993: Doom, is a first-person shooter (FPS) video game by id Software. It is considered one of the most significant and influential titles in the video game industry, for having ushered in the popularity of the first-person shooter genre.[Wikipedia a]
- 1995: Software-Rendered engine arose, it only use CPU to render graphics.
- 1998: GPU-based rendering engine Unreal Engine first introduced by Epic Games.
- 2004: Unreal Engine 3 were presented, it was designed to take advantage of fully programmable shader hardware.[Wikipedia b]

3 Overview

Game Structure Games are different from any other software because they have a different structure. If the player starts up a game, a introductory movie may played. Then the front end loaded with options of game, sound, video, etc. After starting the game, it shows the loading screen and comes the main scenes. At the end of the game it may show an end movie and player's credits, then it shut down finally.

Game Loop A game program is actually in infinite loop of process, update and render after it has been initialized in order to output the smooth pictures.

Game Development Process There are a lot of components in the development process of a game such as gameplay, art, audio, etc. So the development process is a little different from the regular software development process. The following is the four phases in game production:

1. Pre-production: in this phase, pitch, GDD, project plan and prototype are written. Basic ideas and concepts of the game are produced as well as a complete plan on the game development.
2. Production: after making the plan, the game is going to the main production stage, when assets and source code for the game are produced.[Chandler 2009]
3. Milestones: Milestones mark major events during game development and are used to track game's progress. This stage is necessary for a commercial game production.
4. Post-production: Once a game releases and ships, it goes into the maintenance phase, especially for online game. The continuous maintenance and iteration are guarantees to the value of a game.

4 Game Engines

As a game has a lot of functionality and components, they are generally encapsulated in some reusable frameworks or libraries which is called game engines. Game engines provide the core funtion parts of a game, such as rendering, physics, collision detection, sound, scripting, animation, artificial intelligence(AI), networking, and so on. Some famous game engines:

- Unreal Engine
- Unity
- CryEngine
- Cocos2d
- BigWorld

Besides, some big company like Microsoft or AMD also provide some APIs and SDKs for developers to make it easier to deal with the compatibility and robust of games. For example, the Microsoft DirectX APIs and SDKs provide a series of controls on 2D and 3D graphics, sound, fonts, computing and media.

5 Conclusion

Game development consists of many aspects, including physics, mathematics, art, sound, etc. Behind a good game is a united, excellent team.

References

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