The Taiwan Cavaliers: A Reference Game for Learning Game Development

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ABSTRACT

The Taiwan Cavalier is a 3D action game made with Virtools. It is based on a well-known legend in Taiwan of a hero called Liao Tian-Din in the early twenty century. The game is part of an ongoing project for a game design curriculum for students without programming background. It is designed as a reference game for the students, so it has packed a lot of features found in commercial games. For example, it has a companion system that a partner will always accompany Liao and fight with him. He can steal props from the enemies, and his level of expertise increases as he steals more and more props. He also has "special moves", which can only be used under certain conditions and can attack all the enemies at once. He can protect himself against the enemies' attacks. He has a level of tiredness that if he gets too tired, he cannot attack and must run away from the enemies. The scenes were also designed based on the architecture style of that time of Taiwan. Students can learn to develop their own games by inspecting similar features in this reference game. We have also made a number of tutorials for it. The game itself got a number of prizes in Taiwan, and it was exhibited in the 2006 Taipei Game Show as well as the 2006 Tokyo Game Show.

INTRODUCTION

Making computer games is a multi-discipline business. A game development team can be composed of people for various tasks such as story/gameplay design, programming, art, music, production management, etc. [1], but most of them come from two quite different disciplines - programming versus art. These two types of people think quite differently. The programmers generally think systematically and are well organized, while the artists think randomly and intuitively [2]. There are also different jargons with them. On the other hand, in the game industry they need to communicate with each other very often, and it would be best if such a communication can be started as soon as they are still in the school.

In Taiwan, there are currently only a handful universities offer game related degrees or curricula. But the numbers are increasing, partly because the government put the game industry high in the priority list, but the more important factor is the rapid growth of China game market.

The Department of Digital Content Design of our university was started in 2001, which is among the earliest departments focus on the design and creation of digital contents in Taiwan (Now there are more than two dozens and the number is still increasing). In the first two years we have both students from the computer departments and the art/design departments of vocational high schools, in the thought that they can take the advantages of each other. We soon realized that it was so hard to teach students with such diverse backgrounds in the same class. Now most of our new students (over 90%) came only from the art/design departments. Nevertheless, we put strong emphasis on interdisciplinary communication in our curriculum design, and we have to put into consideration that the division of labor is low in the Taiwan game industry and the students have to face the labor-cost competitions from China, Korea and India. We concluded that the students must have a better overall understanding of the the design/development process.

In our game design courses, we found that it is a good idea to let the students design their own games [14]. In this way they will pass through every phase of the game design /development process. They will have better ideas about what the other people are doing when they are in the game industry. But without programming knowledge it seemed impossible for them to actually make games. Fortunately, there are visual programming tools such as Virtools [3] and Quest3D [4] nowadays so that students need not to learn C++ for game programming, which we have tried to teach them but with despaired results.

Even with such visual programming tools, it is still very hard for the art/design students to write all the programs of a game. So we tried to develop some reference games,

because the game industry is mature enough that there are many well-known game genres, e.g. action, role-playing, adventure, etc. In [5] Rollings and Adams have thorough discussions on some popular genres and the characteristics of them. Students can learn to develop their own games by inspecting similar features in these reference games. These games are developed with Virtools, and because Virtools programs are represented in a flowchart manner which can be easily understood, the students can modify the reference codes very easily to suit their own need.

The Taiwan Cavalier is an 3D action reference game that we made. It is based on a well-known legend in Taiwan of an hero called Liao Tian-Din in the early twenty century. It has packed a lot of features found in commercial action games. For example, it has a companion system that a partner will always accompany Liao and fight with him. He can steal props from the enemies, and his level of expertise increases as he steals more and more props. He also has "special moves", which can only be used under certain conditions and can attack all the enemies at once. He can protect himself against the enemies' attacks. He has a level of tiredness that if he gets too tired, he cannot attack and must run away from the enemies. The scenes were also designed based on the architecture style of that time of Taiwan. We have also made a number of tutorials based on the game contents, such as how to create the buildings and characters, character rigging and animation, 2D interface programming, etc.

Figure 1. The Taiwan Cavalier

The game itself got a number of prizes in Taiwan, and it was exhibited in the 2006 Taipei Game Show as well as the 2006 Tokyo Game Show. It was also reported by the famous Japanese game site 4Gamer.net [6].

PROGRAMMING TOOL

Virtools Software Suit is a powerful interactive 3D content prototyping and production platform which speeds up the game development process [3]. It allows a computer artist, game designer, or programmer to create elements of a game in a drag and drop environment in such a way that a workable prototype emerges at a very early stage.

The main component of Virtools Software Suit is Virtools Dev, which presents a graphical programming interface to the game designers or programmers. Programs are written by dragging precompiled components, called the ***building blocks***, from the component shelf to the schematic windows of various game characters or scene objects. More complex behaviors can be programmed by interconnecting different building blocks and their parameters. Even more complex behaviors can be programmed using the built-in script language called VCL or by the SDK, which can build customized building blocks using Visual C++.

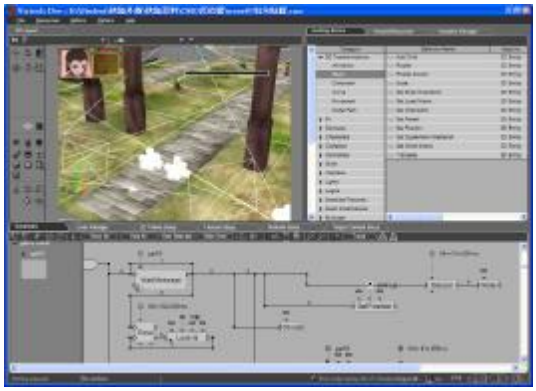

Figure 2. The graphical programming interface of Virtools™ .

Virtools Dev is in fact an object-orient programming environment with a graphical front end. Moreover, it has many add-on packages to simplify the game design process, such as Physics Pack, AI Pack, and add-on libraries for Microsoft Xbox™ and Sony PSP™. A good introduction about the benefits to use Virtools to make games can be found in [7].

Virtools does have its shortcomings compared to commercial game engines, which is beyond the scope of this paper. On the other hand, it is a very good game prototyping tool, and in particular a very good educational tool for teaching game design and game programming. Even the art and design students can start to use it within hours, and because of its interactive nature, they can test and build their programming knowledge piece by piece without facing hundreds of compilation errors.

STORY & ART DESIGN

The Japanese colonial period in Taiwan refers to the period between 1895 and 1945 during which Taiwan was a Japanese colony [8]. This period has strong impacts to the economy, industry, public works, and culture of this small island, and has produced many legends. The most famous one of them may be the legend of Liao Tian-Din [9]. He was a thief, a robber, and a killer in his real life,

but in the legend he became an anti-Japanese hero. Simply to say, he can be considered as the Robin Hood of Taiwan.

Choosing such a legend as the back-story of the game had nothing to do with anti-Japanese sentiment [10]. It was just because the legend was so well-known in Taiwan, so it would be much easier for the students to collect more information to help them design the game. In fact, it was discussed during the design phase that any story causing political or ethnic issues should be avoided or not, but we did not want to make the design phase more complicated. After all, there were only two levels in this game, much shorter than the whole legend. We also have made the characters more comic-like to reduce the seriousness of the game (Figure 3).

Figure 3. The characters in the game

In the first level, Liao and his best friend Red Turtle found that a lot of Japanese polices had arrived in the small village and captured many villagers who dared to fight against them. The mission of Liao and Red Turtle was to rescue all the captured villagers. When all the villagers were rescued, the evil master of this level, a Japanese warrior, will appear, and of course Liao had to defeat him to pass this level.

Figure 4. Liao is fighting against the evil master of the first level.

In the second level, the angered Japanese Governor-General sent ninjas to capture Liao's son as hostage. Liao and his wife rushed through the bamboo forest to rescue their beloved son. After the ninjas were defeated, the final master, i.e. the Japanese Governor-General, would appear. If Liao can defeat him, then he would promise that he would never bother the villagers again.

Figure 5. Liao's son was captured by the female ninja, the evil master of the second level

To reflect the architectural style of Taiwan in the early twenty century, the game scenes were built based on two of the famous buildings in the central Taiwan: the Confucius Temple [11] and the garden of Lin's family [12].

Figure 6. The architectural style reflects those of Taiwan in the early 20 century.

GAMEPLAY FEATURES

In addition to the features generally found in every action game such as vitality, weapons, evil masters, etc. this game has implemented many special features which made it more playful and visually attracting, and also gave itself more value as a reference game.

Map and Arrow

In the first level, a small map is shown on the top-right corner of the screen (Figure 7), with a red arrow indicating the position of Liao and yellow dots indicating the positions of the villagers. In the second level, an arrow will always point to the destination bridge where Liao's son was hidden and the remaining distance is shown, so that the player will not get lost in the bamboo forest.

Figure 7. A small map on the top-right corner will show the positions of Liao and the villagers.

Props

Since Liao was famous as a thief, he will steal props from his enemies. There are totally 6 different kinds of props. The number of each props he stole is shown in the bottom-right corner of the screen (Figure 7). Each prop has a specific use, and has a time limit to use except the tonic, which will increase the vitality (blood level) of the player immediately. The level of expertise will also increase as the player gets more props.

Companion

The player is not fighting alone in this game, instead he has a companion. In the first level of this game, the best friend of Liao, called Red Turtle, will always be accompanied and fight with him (Figure 7). In the second level, Liao's wife Ron-Chin will accompany him to rescue their son (Figure 5). The companion system makes the game more interesting, and the dialogues between them enrich the story contents as well.

Neutralization

If the player and the enemy attack each other at the same time, then the attacks are neutralized; i.e. both of their vitalities will not decrease.

Tiredness

Liao has a level of tiredness which increases every time he fights. If he gets too tired, he cannot attack the enemies and can defense only or run away. The level of tiredness can be restored if he takes a rest.

Special Moves

A "special move" can be issued under certain circumstances. When it is issued, the background disappeared, and an eight-diagram is shown. All the enemies inside the eight-diagram will be attacked at the same time, and one of the letters from DREAM (the name of the design team) will be collected randomly. A special reward is given if all the five letters are collected. The evil masters have their own special moves, too.

Figure 8. A special move of the player.

Figure 9. A special reward.

CONCLUSION

Developing 3D games for the art and design students is a challenging task, but with the help of visual programming tools such as Virtools and different emphases on the content design, our students have proven that they can create 3D games even better than the CS students do because they have better skills to create the game contents as well.

We have also made some other reference games. Virtual Filial Piety is a 3D role-playing game based on the famous ancient Chinese legends called 24 Filial Piety [13]. The player acts as the legendary figure Young Xiang who rescued her father by fighting with a tiger. As the protagonist going through levels of the game in order to rescue her father eventually, the player realizes the important virtue of "filial piety comes before every virtue".

Figure 10. Virtual Filial Piety

The Ant is a 3D adventure game. The main character is a male ant that needs to go through a number of adventures in order to rescue the princess ant. All the three reference games have packed a lot of features found in commercial games. They were well crafted and documented, so that other students can easily modify them for their own need.

Figure 11. The Ant

With the aid of these reference games, students started to design new games quickly. Another two new games have been developed, and they are also added to the reference game library. One of the new game, Chess Fighters, is shown in Figure 12.

Figure 12. Chess Fighters

We have also conducted class questionnaires with the students. The average satisfactory point was 3.41 between 0 to 5. The point was higher than other programming courses, but lower than most non-programming courses. It seemed that programming is still more difficult to the design students even with a graphical front end. We have more discussions about the problem in [14].

With the advance of software technology, there will be more programming tools with a graphical front end like Virtools or Quest3D. These tools will not only make programming accessible to more people but also make programmers more productive.

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