The University of Hong Kong

Department of Computer Science

Final Year Project

Topic:

A cross platform game or application to promote computer science

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Abstract

This project will focus on one and only one goal which is to promote computer science to the secondary school student in an interesting way. To achieve the goal, a two-dimension role playing game called "The Genesis" will be developed. This cross-platform mobile game (Android and IOS) will be developed by using C# language and a popular game engine called Unity 5. For the content of this game, the player will control a character and complete the mission following the game story. Player will learn some basic of computer science from the game story, like if-then-else logic in simple programming. In the final stage, the game will be deployed to Google Play Store and Apple App Store and allow any person download the game for free.

Keywords: Cross-platform game, 2D RPG, Unity 5, C# programming

Introduction and Background

Every application that we are using everyday like Facebook, WhatsApp and Google Search have a simple and user friendly interface. Behind all these simple interface, there were thousands of computer scientist built them with very complex code and logic. We have to confess that computer scientist would be the one who changes the world in current century. However, there are only few or even no people promoting computer science in Hong Kong secondary school and the students have very few ways to know or learn about it. So, a cross platform mobile two-dimension role playing game (2DRPG) called "The Genesis" will be developed for achieving the goal. This game will not hard sell computer science. Indeed, it will be attractive and interesting which make most of the students will be willing to play it. After playing the game, the player will learn about computer science and their interest about computing will also be developed. In the following report, the objective, scope, foreseeable problems and adopted methodologies of achieving the goal will be discussed. At last, there is a project schedule that listing all kinds of job required in this project.

Objective and Scope

The objective of this project is to promote computer science to secondary school student. To achieve this objective effectively, the mean of promoting should be attractive and interesting. Base on the project targeted users which are Hong Kong secondary school students, a mobile game should be a great mean. Most of the students would like to spend time on playing a game instead of reading an article as there is excitement in the game play and sense of achievement after they accomplish the game mission. Moreover, accessibility and mobility are also considered when cross-platform mobile game is chosen as the mean to achieve the objective. For

accessibility, most of secondary school students have their personal smartphone and they are able to access and install the game through the online application store easily. The users will be able to download it from Google Play Store and Apple App Store which are the online apps store of two common mobile operating system, Android and IOS. For mobility, users are able to play the game everywhere after they installed the game on his or her phone. About the game content, it will not involve all the fields of computer science but only involve few basic fields of it. Programming, logic and algorithm will be the three main fields that will involved in the game. The player would be able to understand some basic technical knowledge after they played this game.

Foreseeable Problems

For developing a two-dimension role playing game, there are four main problems that have to solve. The first one is the game story design. In role playing game, the player will control a main character and walk around in the game world. And player should be able to talk to some non-player character (NPC) and all the dialogue need to be well designed such that the player can learn computer science knowledge from it. The second one would be the graphic design. The key element of a good game should be the graphics in the game. Players will be attracted by the beautiful graphics and willing to play it. As a computer science student, graphic design is really the hardest and challenging part of this project. The third thing would be sound and music. A good game also contains suitable sound effects and background music. All these sound track resources need to be recorded or find in the internet. The final problem would be the game logic. Creating a game involve a lot of logic and all the logic need to be well designed. For example, non-player character may have different response in different states and state diagram of

different character need to be clearly defined. All of these problems would be solved in different

stages of the project as some problems may depend on other problem solutions.

Related Studies

There are thousand of 2D RPG that can be found in internet. The most popular and

classic RPG would be Final Fantasy series. It is a good reference for developing a 2D RPG as the

design of the game is classic and attractive. For example, the dialog with NPC could be used like

the game play show in figure 1. It is simply and clear so that the player will be able to read

through the information in the dialog. Apart from reference of RPG, there are some mobile game

that related to computer programming and help the player understand the knowledge about

programming. In the game "Human Resource Machine" (Figure 2), player need to drag and drop

the programming block in the game and solving the problem. Programming was presented as a

puzzle game so that the player can solve the programming problem like puzzle solving. The

another similar game about programming would be Swift Playground that was recently released

by Apple.

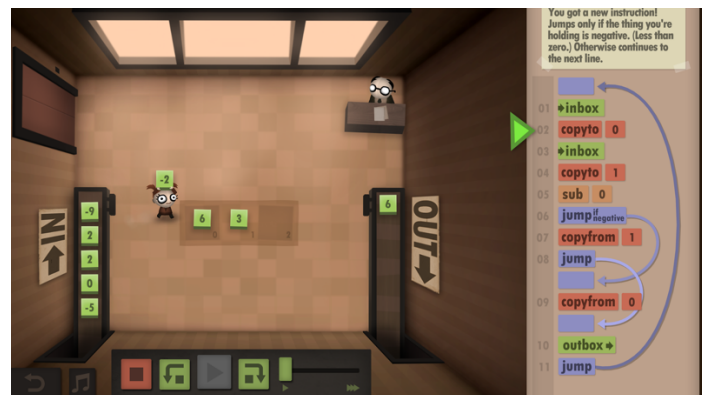*Figure 1 The game play of Final Fantasy.*   *Figure 2 The game play of Human Resource Machine.*

Methodology and feasibility

The game development will be based on one key element – a game story. A story content related to computer science will be written during the early phase of the project. For the game content, player will control the main character for collecting different items and learning different skills in the game world. Player is required to solve the hardest problem "The Truth" according to the knowledge he or she learnt in the game and finally become "The Genesis". In the story, it will involve some technical contents about computer science and the students will understand that after they played the game. Player need to equip suitable item and skill with the corresponding characteristic and fight with different monsters which maybe some computer science problems. The story should be evaluated by few secondary school students that had no knowledge of computer science and the improvement of story will be made based on their comments.

For the next step, game flow will be designed according to the game story. And then the required graphics like the characters and background image will be drawn or collected from the internet. To achieve the above in an attractive and interesting way, the game graphics should also visualize those technical terms to different items and skills. Sound effect and background music will be recorded or collected after all the required graphics were gathered. Then, the game prototype development can be started.

For the method of game development, a famous game engine Unity5 with C# language will be adopted in this project as the game can export to different platform once the game developed. And Unity5 support 2D RPG development which is perfectly match the feature of

this project. The tool provided will be very helpful and increase the effectiveness of the game

development process. After the game prototype developed, the game will be tested and evaluated

by some secondary school students. The development will continue based on their comment and

the different game functionality will be built incrementally. After all the functions were built, the

alpha version of the game will be tested by some students and see whether there are any

problems in the game and the improvement will be made based on it.

Finally, the game will be deployed to the Google Apps Store and Apple Play Store for

beta testing. The further improvement will be made according to the comment on the store. The

beta game will also be submitted as the final product of this project.

Division of Labor and Project Schedule

As it is a personal project, there are no other team members in this project. Most of the

job will be finished by myself except some graphic design jobs and sound recording jobs.

Heading	Content	Deadline
Detailed Project Plan & Project web page	Write a detailed project plan explains all the related information of this project. Also create a web page introduce the game.	2nd October, 2016
Game Story Line	Write about all the character and the related dialogue that may interact with the player. Also design how the story related to computer science content.	20th October, 2016
Story Evaluation & Improved story	Improve the game story line after interviewing some students	31th October, 2016
Graphic	Create and collect all the graphics include the character, environment, items and skills icon, etc.	15th November, 2016

Sound & Music	Record and collect all the sound effect and background music required and fit it to the different scenario.	5th December, 2016
Playable Game Prototype	The primary game will be developed according to the story, game flow, graphic and sound & music. Noted that few of the game function should be working in this phase.	6th January, 2017
First Presentation	Present the primary product which is part of the game and demonstrate the feature of the game.	9th – 13th January, 2017
Evaluation and Preliminary Implementation	After demo the prototype to some students, the first part of the game which is playable will be developed based on the prototype comments.	22nd January, 2017
Alpha Version of game	The playable game with complete game feature and functionality will be developed. It will be tested with some students and ask for their comment.	1st April, 2017
Final Product and Final Report	Finalized tested game with complete game feature and functionality based on the comment of alpha version will be developed. The final detailed report of the game will be written.	16th April, 2017
Final Presentation	Present the product which is the game and demonstrate the game.	18th – 21st April, 2017
Project Exhibition	Exhibit the complete product which is the game to the public.	2nd May, 2017

Conclusion

We cannot live without computing nowadays and everything is related to computing. The demand of computer scientist will be raised in the near future, but the supply will not increase if we do not promote it actively. This project tackles the problem and draw the attention of secondary school students on computer science. It will attract some of them to select computer science as their future studies field or even for their future career.

References

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