

Android-Based Snake Game Design and Development

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Abstract

in modern society, mobile phones have become an indispensable tool in our life, and mobile games in the busy pace of life, to relieve a certain amount of pressure for everyone, this topic put forward the design and implementation of android-based snake game. This system adopts Android open source system technology, using Java language and Eclipse editing tools to write the system, the realization of the snake game simple function: snake free movement, eat apple body longer and hit the wall, body game failure. Let the player in the simple operation, better experience the fun of the snake game.

Keywords

Gluttonous snake, Android. Java, The Eclipse.

1. Introduction

According to the increase of the science and technology and the development of the society, continuously improve people's living standard, the mobile phone has become a very important a tool in our life, has a mobile phone, we can contact with relatives and friends anytime and anywhere, and we also can get what we want from the cell phone information, can bring people more happy more entertainment experience. China industry research network released the 2015 edition of China's smartphone market research analysis and development trend forecast according to the report, the global handset shipments of 1.89 billion in 2014, an increase of 4.9%, China's total production handsets and 1.6 billion account for 85% of global output, and in our country, the mobile phone users has reached 1.28 billion the mark, the penetration rate reached 95%. Therefore, mobile phone has become an important tool in our life, and the development of mobile phone has become a major trend of social development, and game development is an important component of mobile phone development, so the prospect of game development is bright.

2. Overview

2.1 Research contents

In this paper, the design of Android game snake is based on the Android system developed by Google company. It USES Java language mainly to realize some basic control of snake game and the end of game failure.

2.2 Research significance

The development of android mobile phone software has a broad development future and broad development prospects. It is a mobile phone client software developed on android system. At the same time, compared with other systems, its users are also very large. Therefore, the development of android game software can enable users to have fun in their spare time and fully relieve the current rapid sense of social rhythm.

2.2.1 Current situation of foreign countries

With the popularization of mobile phones and the rapid development of science and technology, the functions of mobile phones have become more and more complete, and the android system platform has become more and more hot with the development of science and technology. Up to now, at home

and abroad, android system has occupied the main trend of mobile phone system. According to the survey, as of 2013, android system accounted for 80% of the mobile phone market in Western Europe and North America, which indicates that android system is at the peak of development. One of the major components of android is mobile games, which are increasingly valued by mobile developers. So far, there are 5.9 billion mobile phones in use worldwide, and the number of users is increasing every day. Mobile games have a bigger potential market than any other platform.

2.2.2 Domestic status study

After Google released the open source Android operating system, domestic operators and mobile terminal companies flocked to release their own operating systems based on Android. For example, Ophone of China mobile, Lephone of lenovo, MIUI of xiaomi, dim sum OS of innovative engineering and rofrog OS specially customized for 1000 yuan Android phones. Most of the domestic manufacturers of copycat phones have also turned to the research and development and production of Android phones and tablets. The market price of Android phones has rapidly decreased, and the smart phones with various functions and good appearance and low price have quickly occupied the market. More and more consumers begin to use Android smart phones. Since many mobile phones in China are customized models, they cannot access the official Market of Google. Therefore, there are many third-party software stores in China, such as China

For the wisdom of cloud, innovation works application and pea pod. Most domestic users download apps through the domestic third-party software market. With the support of a large number of users and Google, a large number of domestic developers began to join the queue of Android software development, and developed a lot of apps in a short time. Domestic developers customized a lot of third-party Rom, tool software, social software and games according to the habits of Chinese people, which are deeply loved by the majority of users. Due to the low self-paying ability of Android mobile phone users, domestic individual developers mainly obtain economic income through advertising platform advertising in applications, and attract a large number of users through free means. In a word, the domestic development form of Android is good.

2.3 Application prospect of the project

2.3.1 Introduction to the gluttonous snake

Snake game is a mobile phone game model, because it is easy to operate, easy to understand. The game is through the manipulation of the snake, so that the snake can move in different directions to eat the apple, let the snake body become longer, and then get game points, it is said that eve was lured by the snake, stole the apple, god turned the snake into a poisonous worm, which is the sign of evil. Later in the Renaissance, someone created a game, this is the gluttonous snake game of the past. Later, it gradually grew into the present snake game, which was first invented by a man named Jeremy. The snake game is simple and easy to learn, suitable for young and old, and deeply loved by everyone, and then gradually developed into one of the mobile games.

2.3.2 Application prospect

In today's society, the pace of life is getting faster and faster, and many people want to relax and adjust themselves in their leisure time. Therefore, mobile games have become a tool to adjust their life, and mobile phones are simple, convenient and can be carried around at any time. Mobile games have won the favor of many people by its simple operation. With the development of science and technology and the improvement of the quality of life, the development of mobile game platform will certainly have a lot of room for development. With the opening and application of 4G, mobile game will definitely usher in a new round of game craze. Over the past decade, about 350 million mobile phones have been pre-loaded with snake, making it one of the most popular games in gaming history. Snake game proved that the mobile phone can not only provide you with a chat function, but also enrich your entertainment life, is great.

3. Introduction to key technologies

This chapter mainly introduces the relevant technical knowledge involved in the research of this topic and the later implementation process. This topic is a flexible application of the multiple knowledge learned. Firstly, it elaborates and introduces the most basic development environment of Android and the key technologies applied.

3.1 The Java language

Java is an object-oriented programming language, is by Sun Microsystems company launched in May 1995 the Java programming language and Java platform, Java technology also has the world's largest community, high universality, high efficiency, the portability and security of the platform, data center of general PC, game consoles, super computer science, professional development of mobile phones and the Internet, in the world of cloud computing and mobile Internet, Java has significant advantages and broad prospects.

3.2 The Android

Android is the operating system launched by Google, among which the operating system, middleware, user interface and application software constitute the android operating system. It is called the first mobile terminal and is an open and complete mobile software. Android is not only powerful, but also has the advantages of openness and free. The global telecom industry and mobile phone manufacturers do not hesitate to join the android mobile phone alliance. The system architecture of Android adopts layered architecture. Android is divided into application framework layer, Linux core layer, application layer and system runtime layer, which are arranged in a certain order.

3.3 Development environment and construction

3.3.1 Android game development environment

This design will be in Windows7 operating system, according to the android compilation principle, we on the basis of Java knowledge, using jdk8 this design tool. Eclipse this is a user-oriented compilation and design platform with multiple functions for development, including a lot of development software, including Java eclipse. ADT is based on the environment of android development, eclipse, which is the development platform, to design and implement the function modules that want to achieve. The design of this program requires several major development kits, such as SDK Android, and includes the research and implementation of Android platform terminal. The system to achieve several modules of the snake game, the functions are as follows: start the game, pause, the end of the game and so on.

3.3.2 Construction of android game development environment

This design is based on the existing mobile game software, on the basis of the PC mobile terminal environment, the realization of the snake game and research, this design with the snake game as an example, to achieve a simple man-machine battle. This design is based on: Windows7 (64-bit) operating system, android virtual system 4.4.2 version to design. JDK is actually a kind of software development kit of the Java language, which provides a development environment and a running environment for Java. AndroidSDK (software development kit) is the only Android development kit, which includes the program to use in the development of libraries, compiler and other resources, is to develop the Android software must have some function library resources such as a collection of package, the license agreement for Apache, development language is Java, it must have the Android operating system support, is one of the components of the Android program we need. ADT is a plug-in specially designed for developing Android programs for Eclipse. ADT plug-in better extends the functions of Eclipse integrated environment, making it easy and fast to generate and adjust Android applications.

4. Overall design of the system

4.1 Demand analysis of the system

A program according to the assembly language snake game software design and development, the key is to expose a graphical snake and snake position change. Said the snakes body with a small square, popular says, is composed of small square links, with different color said the head of the snake, the little squares movement direction must be controlled by the head of the snake, the snake can't movement in the opposite direction, if not press any key, the snake will go straight ahead, however, press up, down, left, right, head of the snake, drive the snake body moving, and their direction is the same, therefore, we must be set at the outset the location of the head of the snake, the snake drive snake body movement, and then draw graphics. Eat an apple when, in fact, the first draw the new position of the snake, and then mapped the snakes body according to the head of the snake bearing, at this time, due to not remove the screen, the location of the snake appeared before and moved the location of the new snake will deviation out of a small square, and the background color will hide color, just the end of the small squares so that the snake looks like a small box body growth. The appearance and disappearance of apple also depend on this kind of effect to realize. When the game is over, the snake's head hits the wall and the snake itself.

4.2 Operating environment requirements

Development software: Eclipse 4.3.0; The JDK: JDK Revision1.8.0 _73; SDK: Android SDK Manager Revision 24.41

4.3 General design of the system

Snake game system design process, first of all, to design a game interface, players to open the software, enter the main interface, click on the tip of the build, entered the game, and then to control the movement of the snake, eating take random distribution in the apple on the map, and then the snake body get longer, the speed will be faster, the head of the snake don't touch the walls and out under the condition of snake to eat as much as possible of the apple on the screen now, to get points, the game does not win, can only eat more apple, get more points, if the snake touch the wall and snake body, the game will be over, then there will be players winning points.

4.3.1 Function module division

The game design is used, bottom, left and right to achieve snake process, I divided into the following several modules: game main screen (painted walls, head of the snake, and apple), the game process (by controlling the up, down, left and right to make the movement of the head of the snake), the game (in integral and display the start game) module three modules.

4.3.2 Main interface of the game

The main interface of snake game is to treat all the screens as a two-dimensional array, and each element can be regarded as a small square. Therefore, each square will sit in a different state during the implementation of the game, such as blank, wall, apple and snake itself. In our experience of playing the game, we actually change the state of the corresponding square, and then draw itself from the whole View.

4.3.3 Game algorithm

Snake at the core of the algorithm is how to achieve mobile and apple, not in contact with apple, are moving in the direction of the team a small square, and the small squares is the snake's head node, and described the little squares, and then let the head pointer corresponds to the team, and with the game within the framework of the background color map out the team from the start node, you can reach the effect of movement. When eating, you just need to put food into the group. The basic realization of snake movement, when eating food, the body will grow, touch the wall or the body will die. In this game, I will select the key Java language to complete. Many common cross-platform languages, the most commonly used of which is Java, and it is suitable for object-oriented programming language spread computing cases, applications written in Java, cannot be on different

software and hardware platforms. Because Java is mainly used for the development of network applications, its security performance is very high. If there is no land, it is not safe for users to download it directly from the Internet. However, Java will use its own unique appropriate system to prevent the virus program built to download the local system damage threat.

5. Detailed design of the system

To draw the wall, the `onDraw()` method checks which positions are assigned. , then scan all the points in the map, check which kind of map it is, and draw it. First create a class that inherits the `View` or `SurfaceView`, overriding the `onDraw()` method. Then load the image into the file we want to use. Use `loadpic(int key.Drawable Drawable)` to load in the previously completed picture, then use `setTile(int picindex,int x,int y)` to assign the map position, use `canvas drawBitmap(bitmap x,y,paint)` to draw out the wall of the main interface of the game.

Snake movement is a process of repeated drawing, in fact, is repeatedly assigned to the snake. First we need to use threads, using the `hundler` class. In the process of snake head continuously moving, if we want to stop the thread that has been moving, we need to use `sleep` method, and if the snake head keeps moving, we need to implement the redrawing. At this time, we should apply the method of `invaildate()`. So when the snake eats the apple, its length is going to change over and over again, and we're going to use an `ArrayList` to do that, and we're going to keep track of where the snake is, so we're going to use a `Coordinate` class `Coordinate` to do that. When the snake doesn't eat the apple, it's a point movement, and we're going to write a method to clear it, to clear out the value that we've previously assigned to the snake, which is essentially a two-dimensional array of zeros.

During the movement of the snake, record the position where the snake has moved, check every change of position, and then see if the position of the snake's head coincides with the position of the wall and the position of the snake's body, and if so, fail. Then use `if` and `for` statements to make the game fail.

The main function of the keyboard is operation, which can control the direction of the snake. At this time, we can use the `onKeyDown` method to achieve this. The game is to change the direction of the snake head by triggering to change the coordinates, including the snake collision detection need to use the snake head. `Position head=mSnakeTrail. Get (0);` To do that and get a new snake head, we say `Position newHead=new Position(2,2);` This code to achieve. Finally, determine the direction of snake's next move by setting integer variables `mDirection` and `mNextDirection`, and then change the coordinates of snake's head to make the snake move.

6. System operation effect display

Start interface is to remind the player, how to enter the game, by clicking the up button, so as to enter the game interface. Enter the game interface and two apples will appear randomly on the map. The player can click up, down, left and right four buttons to control the snake body and control the snake head to eat the apple on the map. Then the snake body will become longer and the game speed will increase accordingly. When the snake head touches the wall and snake body on the map, the game will end, and then the player's score will pop up. Then, if the player wants to start the game again, he or she has to click the up button again to start the new game.

7. Summarizes

Through the establishment and implementation of the snake game on Android mobile platform, I have a deeper understanding of the creation and implementation of Android games, and a clear understanding of the whole process. This project is generally divided into three steps: 1. Complete the map layout. 2. Finish the wall drawing. 3. Complete simple snake exercise. Through these three steps, can basically achieve the snake game. Snake game basic realization: the movement of the snake, the direction of the snake, apple randomly appear, eat the apple snake will grow, encounter the wall and snake body will end the game. Through these functions, let the game project can run well. This

game contact Android knowledge, application Java language development tool JDK8, Java runtime environment (JRE). Includes the Eclipse Java development tools extension suite. Eclipse 4.3.0 and Android SDK Manager Revision 24.41 were also used. At present, mobile phones are indispensable in human life, and android system is the most popular system, and android game development is also the most popular market. Through the development of the snake game, I will enter the society in the future will have a role in this industry, for the future to find a good job, laid a solid foundation.

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