



Path Finder: A Game for Desktop Computers

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Authors' contributions

This work was carried out in collaboration between both authors. Author MSHP designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SDC managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Game application development is still one of the major trends in the Computer Industry. It gets updated day by day. But still the desktop or laptop game concepts rank at the top of the industry. Games are more popular among the younger generation and they find it interesting to engage in those. In addition, games provide a convenient platform for the developers to develop eye catching applications with the use of the facilities provided. In this paper, we present our Path Finder game as a mind relaxation and stress relief game to be played easily without many strategies to follow. There's nothing to think deeply; just to move the cursor in between the cubes without touching the major lines of the cubes to reach the destination from the start position, is the concept we used here. It was our only objective to make it simple as a mind relaxation game without any procedures to carry out while playing. Although we mainly targeted the younger generation for this game, during our implementations we found that this is suitable for any person of any age group. Java is the language we used to develop our game and it was developed using eclipse in Java with the tools like JFrame and windows applications to build the interfaces and JOptionPane to pop up the messages. Main programming concepts were carried out with if else statements in Java. And also we used eclipse with graphical user interfaces which help anyone to get entertained via playing it. This study evaluates the use of Java language to develop simple mind relaxing games.

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1. INTRODUCTION

Modern society is paying a great attention to the relaxation of one's mind because of the hectic life in which they live. Among the busy schedules and the rapid evolution of computer systems, people work with a laptop or desktop computer to facilitate their daily tasks. Computer games [1] play a major role as a method of relaxation of the mind and entertainment. Even today, computer games are more frequently used, regardless of age differences, which have become a source of entertainment all the time.

Many people find it difficult to relax their minds in between their working hours. So playing a simple and a quite easy game within a small time will help a lot to refresh the minds. Not only the adults but also the children are very much interested in playing games nowadays.

Having a good mindset after playing a simple game will help you a lot to find the energy you have spent all day. Our goal was to develop a simple game that can be a solution and a valuable help for people who work all day. As a result, we developed this simple Path Finder game using Java [2,3,4,5] as the main programming language. In this game, a smaller cube is positioned at the starting point, where the player must move it between larger cubes to reach its destination without touching the borders of these larger cubes. So, as a refresh, a person can spend a few minutes playing this game and it will be a great help to get rid of fatigue. As for children, even they can play that to change their normal schooling hours.

2. METHODOLOGY

In the early 1950's, the Massachusetts Institute of Technology was leaders of experimental computer design, creating a variety of software used to showcase the strength of its computers, as well as entertains its young engineers. *Mouse in the Maze* is a game that allowed users to use a light pen (also called a precursor to the modern style) to set up walls, as well as spots that represented bits of cheese (and glasses of martini) for virtual mouse to start hunting. From there, the digital creature would be released, traversing the maze and guzzling up the items in its path. *Mouse in the Maze* was a breakthrough at that time, though it seemed to be simple concept today. Our game can also be cited as an

evolution of maze games which is developed using Eclipse in Java.

2.1 Path Finder Game

Path finder game is itself a kind of maze solving game. A maze is a path or collection of paths, typically from an entrance to a goal. The game is consisted of larger rectangles and Small Square which can be moved along with the curser. The target is to move the small square from the "start" to "finish" without touching the border lines and the rectangle.

Since this game was build using Java language; JFrame and Windows Applications were the main tools used in Eclipse [6,7].

2.2 Eclipse: A Graphical User Interface

Modern operating systems use a graphical user interface or a graphical interface (pronounced gooey). A graphical interface allows you to use your mouse to click on icons, buttons and menus. Everything is clearly displayed on the screen using a combination of graphics and texts.

Eclipse is a powerful platform that has been designed from the ground up to create integrated web and web application development tools. The vast majority of Android applications are due to the existence of Eclipse. This is an open source IDE for java projects, supported by Google. Window Builder is composed of SWT (Standard Widget Toolkit) and Swing [8] Designer. It is therefore very easy to create Java GUI applications without spending a lot of time writing code. Easily add drag-and-drop controls, add event handlers to your controls, edit various properties of controls using a property editor, internationalize your application, and more. JFrames and windows applications in eclipse helped a lot in creating user friendly graphical user interfaces.

2.3 Rules of the Game

Path finder game has collection of paths just like in the maze games [9, 10], typically from "start" to "finish". The path created between larger rectangles and a movable Square can be moved along with the curser. The target is to move the small square from the "start" to "finish" according to the following rules:

1. The moving square should be moved from the start to the finish without touching the border lines and the rectangles.
2. If the border lines are touched, then game is over and player should retry.
3. The game can be won by moving the square from the start to end without touching any lines.

2.4 Outline

The welcome screen directs the player to start the game, and have options to read the guidelines and to exit.

If the player click the 'START' button, a new window with the game interface appears. And if the player clicks the 'GUIDE', a small set of guidelines about rules will appear. And finally if the player clicks the 'EXIT' button, it will close the welcome window and quit the application. The game has 15 large rectangles and two "start" and "finish" marking squares with a moving square joined to the cursor. It also has border lines to mark the boundaries of the larger rectangles.

2.5 GUI Design

This game was developed using Eclipse and JFrame. Random moves and onClick events are

used to move the cursor in order to reach the target.

- a. Algorithm for Game Over

```
If ((small cube) intersects (large cube)) then  
Display ("Game_Over")  
Exit  
End if
```

- b. Algorithm for winning

```
If ((small cube) intersects ('Finish' cube))  
then  
Display ("Congratulations! You_won")  
Exit  
End if
```

Here, Fig. 1 shows the welcome window that is used as the front end of the game. When a player clicks the *Start* button, he goes to the next "Game" window (Fig. 2) where the game can be played. And also by clicking on the *Guide* button, it will navigate to the "Guidelines" display window (Fig. 3). Once we are in the game interface, if we win the game without touching any boundaries, a pop-up message will be displayed as in Fig. 4 and also if we lose the game, a similar pop-up message will be displayed as in Fig. 5.

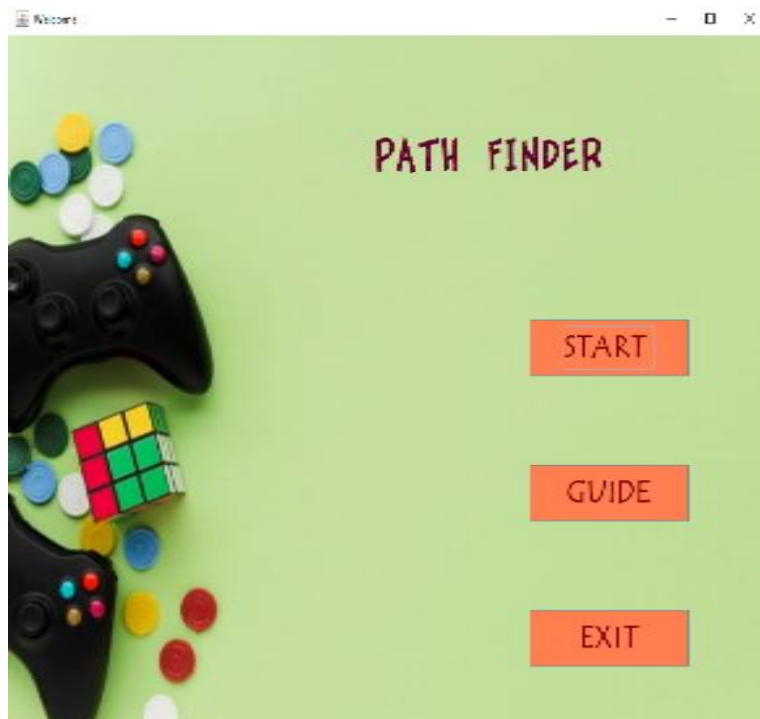


Fig. 1. The welcome window

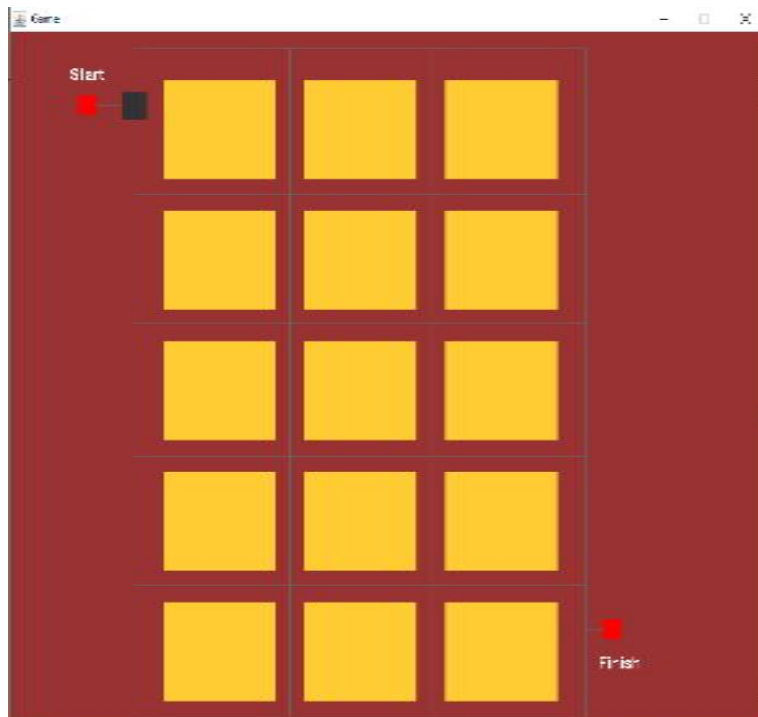


Fig. 2. The game interface



Fig. 3. The guideline interface

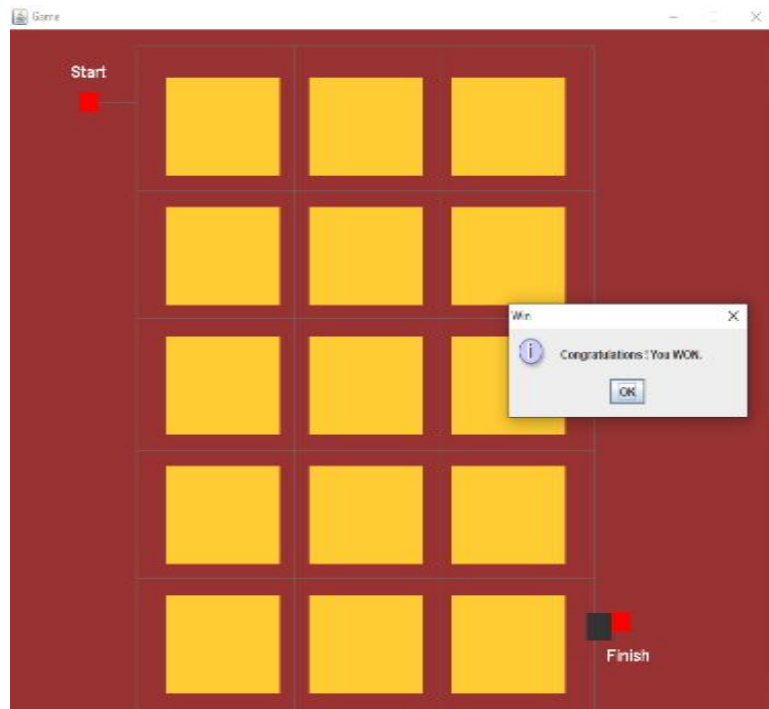


Fig. 4. Game win interface

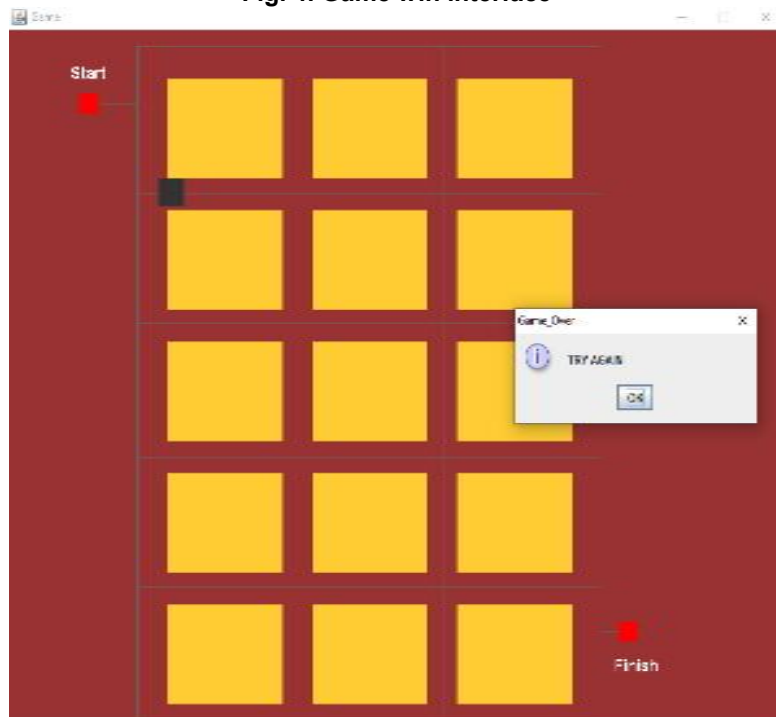


Fig. 5. Game over interface

3. RESULTS AND DISCUSSION

A simulation over 50 randomly selected children and adults of different age groups were allowed to have a test play of this game. It is found out that, more than 80% of those players liked the game.

Table 1. Number of tests implemented

Test Description	Reason for testing
Click on the <i>Start</i> button	To check correctly connected to the next screen
Click on the <i>Guide</i> button	To check whether the window is navigating to the particular guideline screen
Click on the <i>Exit</i> button	To test the game window correctly quit by confirming the exit with alert
Unable to play after <i>Game_over</i> or <i>Win</i> alert	To test whether the game is returning to the welcome screen.

Table 2. Data analysis of the people’s choice to play the game

Age group	Number of people players	Number of player who liked the game
10- 19	20	17
20- 29	20	19
30- 40	20	16

4. CONCLUSION

In this application, we designed, developed and implemented a user-friendly environment for the player. This game will help not only adults but also children to relax their minds because it is not complex. Simplicity is the key factor that we highlight in this game that is lacking in the other office games we usually play. Since all interfaces are designed with human interaction and methodology concepts tested, this will provide a better experience. Beginners in Java language can get a basic idea of what we have presented here, on how to design a simple game. We hope that this game will be useful to all, regardless of age differences, to spend their leisure time. For future improvement, we would like to improve this with more levels and add scores.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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