TRIBHUVAN UNIVERSITY

Institute Of Engineering

Pulchowk Campus

Department of Electronics and Computer Engineering

Minor Project

on

"**iSnake** - Multiplayer Intelligent Snake Game"

Submitted to

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by

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Abstract

This project aims to bring the fun and simplicity of snake game with some new feature. It will include iSnake, whose aim will be to challenge the human players. It will also have the multiplayer feature that will allow more than one players to play the game over a network.

This project explores a new dimension in the traditional snake game to make it more interesting and challenging. The simplicity of this game makes it an ideal candidate for a minor project as we can focus on advanced topics like multiplayer functionality and iSnake .

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Project Background

iSnake - Intelligent & Multiplayer Snake Game. It is a remake of traditional snake game with iSnake – computer controlled opponent snake and multiplayer functionality.

This project aims to bring the fun and simplicity of snake game with some new feature. It will include iSnake[1] , whose aim will be to challenge the human players. It will also have the multiplayer feature that will allow more than one players to play the game over a network.

The traditional snake game does not offer much challenge to it's players. Hence players loose interest in the game after playing it for sometime. Offering some sort of challenge and adventure to the players will help increase the addictive power of this game. The multiplayer and iSnake features of this game will make this game more challenging and interesting.

The simplicity of this game makes it an ideal candidate for a minor project as we can focus on advanced topics like multiplayer functionality and iSnake .

The strong support for networked application in Java programming language and availability of high speed network connection layer in present day computers will allow us to build a very efficient multiplayer version of snake game. Swing API and Java2D API will be used to create stunning graphics and user interface for the game.

[1]the computer controlled snake which acts as the opponent to the human players and has some form of intelligence embedded into it. We will refer to this snake as **iSnake** now onwards in this document.

Short Literature Review

This proposal is organized into several subsections. The objectives of proposing the snake game for minor project is justified by the simplicity of the game. This will allow us to focus on more advanced topics like multiplayer functionality and iSnake – computer controlled opponent.

Information about some of the existing snake games have been collected from the internet. Lots of variants of traditional snake game exists but none of these game provide the experience of a commercial multiplayer games. The introduction of iSnake is unique to this game and will offer an adventurous experience to the players.

A simple block diagram has been presented here which gives some insight into the structure of the game. This block diagram is for illustration purpose. The final block diagram will be more elaborate and will contain all the components of the game.

The scope of this project has been discussed taking into account its commercial value and educational value. The educational value of this project will allow us gain insight of the networking concepts used in multiplayer game. Moreover the iSnake functionality will provide us a platform to make further research into the field of “Intelligent Games”.

A rough project schedule has been presented to help us complete the project in time. Unit of time used in the schedule is “Weeks” as the final date for submission of minor project has not been finalized.

Problem Statement

The traditional snake game does not offer much challenge to it's players. It is impossible to bring out the best playing skill of a players unless a challenge is offered to them. The players loose interest in the game after playing it for sometime due to lack of challenge. Hence when people hear about snake game, they quickly form an image of old age arcade game.

The absence of powerful graphical resources and weak support for networked application in the programming language is one of the factors that has delayed the development of a interesting and challenging version of snake game.

Objectives

This game aims to change the way people think of traditional snake game. It will offer the experience of commercial multiplayer games to the player retaining the simplicity of traditional snake game.

The major objectives of this project are:

1. Create a snake game that will have all the functionality of traditional snake games.
2. Introduce multiplayer functionality in the game that will allow several players to play a game simultaneously. It should give the experience of real time games to the players.
3. Introduce iSnake (unique feature of this game) to make the game more challenging and interesting. The movement and action of iSnake will be controlled by computer whose aim will be to eat the food before human players capture it.

Existing System Study

A large number of games based on the traditional snake game have been developed across large number of platforms(linux, windows, etc) and devices (mobile phones, portable game consoles, etc). These games have lots of variations in them. Some of these games support multiplayer gaming. However none of these game have the feature of “computer controlled snake - iSnake” as opponent to the human players. Hence players loose interest in the game after playing it for sometime.

Existing games:

- Nibbles - A worm game for GNOME. [http://www.gnome.org/projects/gnome-games/]
  Supports multiplayer network game. No support for computer controlled opponent snake.
- Original Nokia Phone snake game [http://www.johnjohn.co.uk/html/snake.html]
  this game was included in early nokia mobile phones. It is plain snake game without any additional feature like multiplayer.

There are large number of variants of original snake game available on the internet. Almost all of them have same set of features. Some games provide the feature of multiplayer gaming.

Proposed System

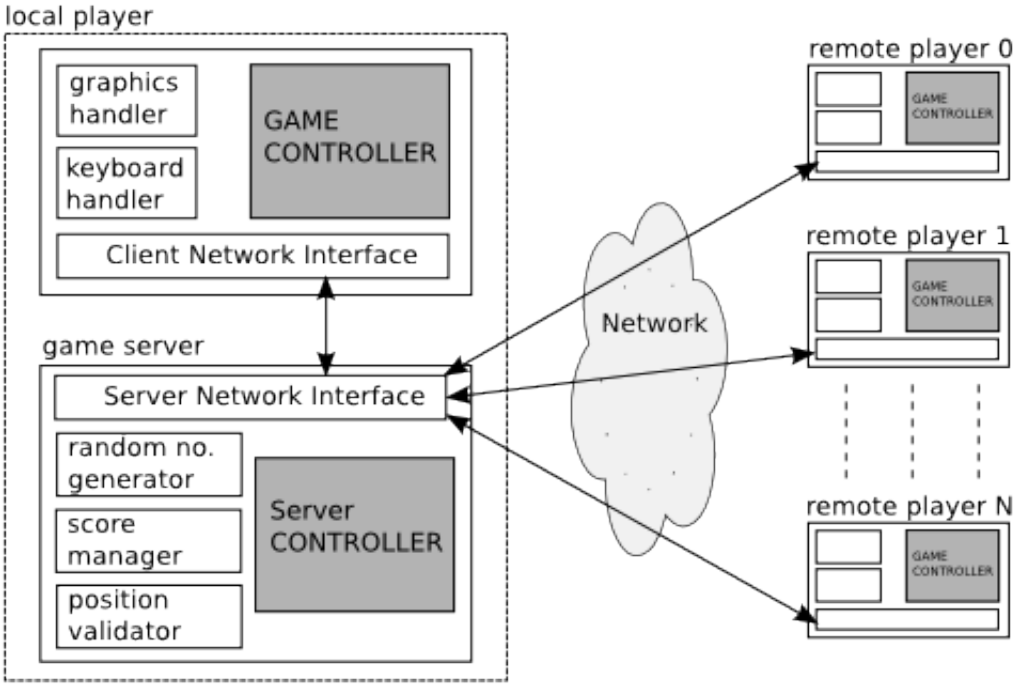
- **Description**

  The proposed game will allow more than one players to play a game simultaneously over a network. The iSnake , a feature unique to this game, will offer challenge to the human players and hence make the game more interesting.

  Swing API and Java2D API will be used to give the user interface (UI) of the game the look of commercial games. The focus of UI will be on usability. As the UI is a very import part of any game, we will follow these UI design guidelines to create attractive game application interface:

  1. Simplicity
  2. Contrast
  3. White Space
  4. Balance
  5. Alignment

- **System Block Diagram**



Methodology and Data

- **Primary**

  The several task of this project will be assigned to each team member on the basis of their interest in particular portion of the game. Weekly meeting will be held to assess the status of each member and propose restructuring of plans when required. Project documentation will be performed by the respective team member(s) at the end of each task.

  Regular discussion with the project mentor will be held to gather suggestions related to the project. It will also provide us chance to update our mentor about the progress of the project.

- **Secondary**

  Netbeans 5.5.1 IDE will be the development tool that will be extensively used by all the team members. Several "Developer Collaboration" features of the IDE will be utilized to communicate and collaborate code between the members. Graphical tools such as Inkscape 0.45 and Gimp 2.2 will be used to create the graphical element of the game.

  A project [http://isnake.sourceforge.net] has been registered at Sourceforge [http://www.sourceforge.net] which will provide us resources to manage this project. As this project involves three team member, we will use SVN [http://subversion.tigris.org/] (subversion - a version control system) to host our code. WIKI , provided by SF, will be used to share development documents and prototype design during development of the game.

  JUnit tests will be developed to test each modules separately. The code will be fully documented using the standard tags of Javadoc (code documentation tool shipped with JDK) utility.

Expected Results

The final version of the proposed game will deliver the following features:

1. A game that will retain the simplicity of snake traditional snake game and contain attractive graphics and user interface to attract the players.
2. The real time experience of commercial multiplayer games will be available in the snake game that will allow more than one players to play a game simultaneously over a network.
3. A computer controlled opponent – iSnake that will strongly challenge the human players in the game. This functionality will make the game more interesting and challenging. This will also be a unique feature of the game over existing versions of snake game.

Scope of Project

Online gaming is a booming business in western countries. If we can develop this game to deliver a thrilling experience to gamers, we can enter into the world of online gaming.

The mobile phone operator will be particularly interested in this game as the conventional snake game is quite popular among the mobile phone users. As the present mobile operators are already testing 3G mobile communication systems (which has very high bandwidth), implementing a multiplayer version of this game for mobile phone users is feasible.

"You can install new compatible Symbian operating system applications (SIS files) and Java applications (Java MIDlets and MIDlet suites) on your phone.....
.... Your phone supports J2ME Java application ...."

extracted from a Nokia 3530 Mobile Phone User's Guide

As most mobile phone today being used already support the Java application , this game can be easily ported to run on mobile phones.

Project Schedule

- Proposal Submission – Sep. 05, 2007.

Task – 1 **Time allocated: 1 week**

UI prototype and Server/Client Network interface design

Develop the prototype of Game Application User Interface (UI). This prototype will form basis for "Swing Implementation of UI". Design the architecture of network logic portion of Game server and Client Application. Test that all I/O operation work as desired.

Task – 2 * **Time allocated: 3 weeks**

Swing implementation of UI

Implement the User Interface in Java Swing.

Task – 3 * **Time allocated: 4 weeks**

Game Server / Client Application network logic design and development

Develop the protocol for communication between the Game Server and Client Application. Make the design of protocol flexible so that it can accommodate future enhancements and design changes. Develop Java classes that realize the functionality of proposed Server/Client network interface.

Task – 4 **Time allocated: 1 ½ weeks**

Game application development

Integrate the codes from Task – 2 and Task – 3 to form the overall game application. It will also develop the logic for overall game play.

Task – 5 **Time allocated: ½ weeks**

Testing

Perform extensive BLACK BOX TESTING of all the components.

** The team will be divided into two group. The two groups will carry out these task in parallel.*

Task – 6 **Time allocated: 3 weeks**

Develop logic and code for iSnake (computer controlled snake that will appear as opponent to human players)

Perform research and development to develop an the algorithms that will control the behavior of iSnake during the game play. Perform testing of iSnake's performance in real game scenarios to test it's level of intelligence.

Task – 7 **Time allocated: ½ weeks**

Perform alpha testing

Gather some volunteers to play the game and help perform testing of the game application.

Task – 8 **Time allocated: ½ weeks**

Perform beta testing

Release the BETA VERSION of Game Application and gather data from players to perform BETA TESTING.

Task – 9 **Time allocated: 1 weeks**

Analysis of test results

Analyze the results of Task – 8 and Task – 9. Make modifications in the game application to correct the bugs found during testing. Efficiency of the game can also be improved by analyzing the test results.

Task – 10

Release 1.0 version of game and submit the minor project.

References

- **Core Java – Volume I and II** by Cay S. Horstmann, Gary Cornell
- **JavaGaming.org – Java technology game development forum** [http://www.javagaming.org]
- **Java Forum** [http://forum.java.sun.com]
- **Official Java Swing tutorials** - http://www.theswingconnection.com/
- **A Distributed Multiplayer Game Server System**

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  May 4, 2001