NOTRE DAME OF TACURONG COLLEGE

City of Tacurong

**JOREX: AN ARTIFICIAL INTELLIGENCE (AI) MOTION-BASED FRUIT RAZOR COMPUTER GAME**

A Thesis Presented To the Bachelor of Science in Computer Science Faculty

In Partial Fulfilment of the Requirements for the Degree

Bachelor of Science in Computer Science

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**CHAPTER I**

**INTRODUCTION**

This chapter discusses the basic overview of the JoRex: An AI Motion-Based Fruit Razor Computer Game, proposed in this study. The background of the study, statements of the problem, objectives, significance of the study, scope and limitation, definition of terms are discussed in this chapter.

**1.1 Background of the Study**.

Playing games is one of the most popular uses of computer technology. In the evolution of computer games, they have grown from modest text based to the three dimensional graphical games with complex and large worlds.

Artificial Intelligence (AI) is the most important part of every computer game and playing the game without artificial intelligence would not be any fun. If artificial intelligence is removed from computer games, the games will be so simple that nobody will be interested in playing the computer games anymore. Without the game AI, the winning would not be difficult at all [l].

The artificial intelligence is used to solve common problems in the computer games and provide the features to the games. Specifically, non-playing character (NPC) path finding, decision making and learning are examined. There are several ways that AI contributes to modern computer games. Most notably are

unit movement, simulated perception, situation analysis, spatial reasoning,

**CHAPTER II**

**REVIEW OF THE RELATED LITERATURE**

This chapter discusses the related studies and literatures conducted. This chapter also discusses similar systems that used almost similar implementation to the proposed study.

Motion Analysis for Creating Immersive Experience, discussed about benefits of playing video games. Thus various studies have been made in analysing the origin of games, its development and in creating new games. This study is unique for its particular case based approach. In this work, a game Mario is taken for the study and a cross comparison is made among the users with opinion prevailing in them, by applying the game with traditional and motion based approach [5].

With current generations raised on the lightning-fast processing speeds and crystal-clear graphics of Xboxes and PlayStations (and with the tide of virtual reality-based video games fast approaching), it’s easy to forget that just 50 years ago, digital gaming existed in only a few laboratories around the world, the experiments of unknown Doctor of Philosophy students or well-known scientists and mathematicians who’d made their name in more traditional fields. From the

**CHAPTER III**

**TECHNICAL BACKGROUND**

This chapter discusses the tools and techniques applied in the developed study, JoRex: An AI Fruit Razor Computer Game. It talks about the game, hardware and the software used by the researchers in the study.

**3.1 Hardware**

The technology used in this research is a USB2.0 HD UVC webcam, which is the main device in this study. The webcam is the one that stream image in real time. In the stream image, the system will determine the object being detected and tracked. That object will serve as the pointer in the game. It is supported by windows 10, windows 8 operating system.

AnROG-GL552VX laptop computer is a portable computer, usually battery-powered, small enough to rest on the user's lap and having a screen that closes over the keyboard like a lid.

It has Intel Core i7Processor, Windows 10, 4GB DDR4L 2113 MHz SDRAM, and 15.6-inch 16:9 HD Display.

**3.2 Software**

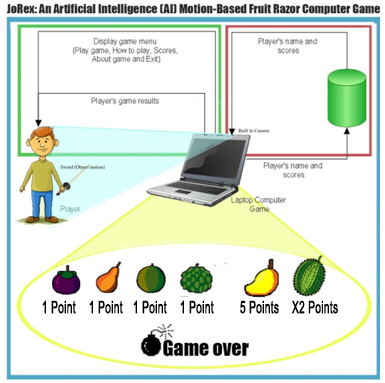
Python is a high-level programming language designed to be easy to read and simple to implement. It is open source, which means it is free to use, even for

**CHAPTER IV**

**METHODOLOGY**

This chapter shows the methods and tools used in the study. It contains the Operational Diagram, System Analysis, Developmental Approach, Schedule, Timeline and budget that the researchers used in this study.

**4.1 Operational Diagram**



*Figure 4.1.1* Operational Diagram of JOREX: An AI Motion-Based Fruit Razor Computer Game

Figure 4.1.1 shows the operational diagram of the developed system. The operational diagram of the developed system is separated into three colors. Firstly

**CHAPTER V**

**RESULTS AND DISCUSSION**

In this chapter discusses the results and discussion, whereas most important data are gathered is concise. With the help of survey questionnaire that are gathered and presented.

After developing the application game, Fruit Razor Computer Game, the researchers made series of dry runs to test the game if it is running successfully. The researchers analyzed the game carefully and used computers to test the game. After much analysis and discussion, the following specific objectives were attained:

1. Discuss the developed system’s process of detecting and tracking the movement of the sword.
2. Design the algorithms used to randomly select:
3. objects such as fruits, bombs, and bonus points; and
4. object’s location
5. Use flat file database in storing player’s information such as name and score.
6. Test the accuracy and friendliness of the developed system in terms of:
7. cutting objects and adding its corresponding points;
8. generating scores;

**CHAPTER VI**

**CONCLUSION AND RECOMMENDATIONS**

**6.1. Conclusion**

This section gave the opportunity to discuss the meaning of the results beyond what they mean statistically.

After implementing the developed system, it has been used, criticized, and evaluated by the players of Jorex: An Artificial Intelligence (AI) Motion-Based Fruit Razor Computer Game. Results showed that developed system’s process of detecting and tracking the movement of the sword must convert the frame from RGB color space into HSV color space in order to detect the green color from the lightest to the darkest. Masking all the objects that were within the lower and upper boundaries of the green color in the HSV color space was needed. The developed system took the coordinates of the biggest contoured object to represent the position of the cursor on the screen of the developed system. In addition, the developed system was able to randomly select objects such as fruits, bombs, bonus points and object’s location. These were represented through essential algorithms that made the system to function efficiently.

Meanwhile, survey results showed that majority of the respondents strongly agreed that the developed system was accurate (3.84), and user-friendly (3.71) in all areas of the developed system.