learning, group coordination, resource allocation, steering, flocking, target selection, and so many more. Even context dependent animation and audio use AI [2].

Video games have been around since the early 1970s. The first commercial arcade video game, Computer Space by Nutting Associates, was introduced in 1971. The user control interface allows the player to interact with the video game. Without it, a video game would be a passive medium, like [cable TV](http://electronics.howstuffworks.com/cable-tv.htm). Early game systems used paddles or joysticks, but most systems today use sophisticated controllers with a variety of buttons and special features. As of today’s generations one of the current featured games is motion controller, a type of [game controller](https://en.wikipedia.org/wiki/Game_controller) that uses accelerometers or other sensors to track motion and provide input. Motion-based game is to provide motivating way to help people exercise their body at home. This game could potentially become an alternative way for completing prescribed home exercises and help increase the likelihood that the user or player could perform exercises at home.

There are a lot of games available for a window-based computer games ranging from role playing games such as Dota 2 that defines a [free-to-play](https://en.wikipedia.org/wiki/Free-to-play) [multiplayer online battle arena](https://en.wikipedia.org/wiki/Multiplayer_online_battle_arena) (MOBA) video game. Currently, the most famous game genre on the market is endless game, which includes Ever wing. These games may look casual but when played, it requires a lot of skills and dexterity for a player to reach the objective of the game.

Hence, the researcher’s came up with the idea of developing a fruit razor computer game as inspired by the mobile game application called “Fruit Ninja” and by the “Xbox Kinect”, a hands-free motion control device for the Xbox 360. In Xbox 360 it allows the players to control game using a combination of the body movement and spoken commands without having to hold a controller in their hands. The developed system is entitled “JoRex: An Artificial Intelligence (AI) Motion-Based Fruit Razor Computer Game”. It is an object motion tracking game that uses camera and sword that track and serve as the pointer in the game. The game contains six different fruits. If the player successfully slices the fruits, points are given to him. If the player slices the bomb, automatically the game end and display the player’s score.

**1.2 Statement of the Problem**

Some of the particular problem in fruit ninja games are the following, when the game is played so long the fruit ninja fruits stopped falling out, bombs are exploding even when it didn’t hit them, as well as the player missed the fruits because of the delayed reaction.

Most of the computer games nowadays can be played by sitting only and not exerting much effort. This might cause many kinds of illness such as addiction and also cause obesity in some players. As with any other addiction, video game addiction has warning signs. The symptoms can be both emotional and physical. Some of the emotional signs or symptoms of video game addiction include; feelings of restlessness and/or irritability when unable to play and preoccupation with thoughts of previous online activity or anticipation of the next online session. Some of the physical signs or symptoms of video game addiction include; fatigue, migraines due to intense concentration or eye strain, carpal tunnel syndrome caused by the overuse of a controller or computer mouse and poor personal hygiene [3].

According to the research at the University College London (2011) spending more than five hours a day in front of a computer may damage one’s heart, leading to an early death. People spending more than four continuous hour’s day in front of a computer 125percent more likely to suffer a heart related death than people who spend less than two hours a day in front of a screen. These researchers believed that this may be caused by prolonged sitting. It can cause 90 percent reduction in heart-healthy enzyme and lipoprotein lipase, an inflammation and metabolic problems caused by long periods of inactivity [4].

**1.3 Objectives of the Study**

**1.3.1 General Objective**

This study aimed to develop a game application called “JoRex: An AI Motion-Based Fruit Razor Computer Game”.

**1.3.2 Specific Objectives**

Specifically, the study aimed to:

1. Discuss the developed system’s process of detecting and tracking the movement of the sword.

2. Design the algorithms used to randomly select:

1. objects such as fruits, bombs, and bonus points; and
2. object’s location

3. Use flat file database in storing player’s information such as name and score.

4. Test the accuracy and friendliness of the developed system in terms of:

1. cutting objects and adding its corresponding points;
2. generating scores;
3. adding bonus points;
4. tracking the coordinates of sword’s location; and
5. graphical user interface

**1.4 Significance of the Study**

This section discussed the significance of the study which was to create a fruit razor computer game that could be beneficial to the players and future researchers.

For the players, it gave entertainment to them and relieve stress.

For the future researchers, this study may help them gain further knowledge on motion-based games that may serve as provider of ideas and basis of references to the future studies of the future game developers, it could also open new ideas for new concepts of motion-based games and how motion-based games could affect mental or cognitive capacity.

**1.5 Scope and Limitation**

This study is focused on developing a Fruits Razor Computer Game that uses a webcam and a sword with a ball attached at the end. The ball attached at the end of the sword serves as the pointer or cursor of the game. The AI could tracked the ball. The game could only run on a recent and latest windows operating system such as windows 7, windows 8, windows 8.1, and windows10. The webcam should be capable of 720pixels resolution recording.

The developed game was not adopted for multiple players, therefore it should only be played by a single player. The game couldn’t be played with the environment with a green background, as the sword used was colored green and if the player has something with the same colour of the sword, which could result to not being able to track the sword frequently.

The player could use the sword to select the menu. In the game proper, the player should stand and face the front of the monitor that has a webcam. To play the game, the player should use the sword with a ball attached at the end to swing and slice the fruits falling from the screen. If the player slices the normal fruits such as papaya, mangosteen, pomelo and sugar fruit they gain one point. If the player slices the special fruits like mango and durian another point is gained. For the mango fruit the user could gain 10 points. If the player slices the durian fruit, the player could receive double points on every fruit sliced within 10 seconds. Bombs or the trap could drop on random time. If the user sliced the bomb, automatically the game ends. When the game is over, the player is prompted to enter a name. The player’s score and name are placed in the flat file database.

**1.6 Definition of Terms**

To fully understand the study, the following terms are operationally defined:

Artificial Intelligence – refers to a part of this game used to track and detect the sword.

Endless game – a genre of games in which the player must slice the fruits

Flat file database – a type of database that stores data in plain text file. Each line of text file hold some record.

Graphical Users Interface (GUI) – a user interface that allows the user and the software to collaborate with one another through graphical icons and visual indicators secondary notion, instead of text based user interface.

Player – the one who plays the game.

Razor – an instrument with a sharp blade used to slice fruits.

Single Player – a video game played by one player only.

Sword – a device made of cardboard with a green ball attached at the end that serves as the cursor of the game.

Video Game – a game played by electronically manipulating images produced by a computer program on a television screen or other display screen.

Webcam – a video camera that captures a series of image.