VR

PACMAN OF THRONES

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About Us

We are Batel Carmona, Mor Eliyahu and Lev Pechersky, Computer Science students
in the Technion – Israel's Institute Of Technology in last semester. We got to know each
other during the studies period and joined together for a joint project following Lev's
great love for computer games.

We have participated in a Virtual Reality project, conducted by Mr. Boaz Sternfeld, and
Mr. Yaron Honen. The project was fun and experiential, teaching and mostly satisfying.
We finally got the result we wanted - a Pacman game in virtual reality.

Introduction

We created a remake of the famous game Pacman in 3D environment for HTC VIVE VR. While developing the game, we tried to insert multiple elements in order to give the user a full experience of a true reality. We managed to create this experience by adding animations of 3D objects, adding many player's gestures which are closed to the real reality, like: movement, jump and attack.

The main components of the game are:

- Player
    - Represented by the camera
    - Control the game by controller gestures
    - Moves according to camera look direction

- Menu
    - Start a new game
    - Pause the game
    - The menu will activated with the controller

- The maze
    - The board game
    - Including several 3D elements: balls, ghosts, visual effects and ex.

- A Map of the board
    - This is for the player convenience in order to see the full board any time

Development Environment

Unity

Unity is a cross-platform game engine developed by Unity Technologies, first announced and released in June 2005 at Apple Inc.'s Worldwide Developers Conference as a Mac OS X-exclusive game engine. As of 2018, the engine had been extended to support more than 25 platforms. The engine can be used to create three-dimensional, two-dimensional, virtual reality, and augmented reality games, as well as simulations and other experiences. The engine has been adopted by industries outside video gaming, such as film, automotive, architecture, engineering and construction.

Microsoft Visual Studio

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps. Visual Studio uses Microsoft software development platforms

such as Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight. It can produce both native code and managed code.

Wix

Wix is an Israeli cloud-based web development platform that was first developed and popularised by the Israeli company also called Wix. It allows users to create HTML5 websites and mobile sites through the use of online drag and drop tools. Along with its headquarters and other offices in Israel, Wix also has offices in Canada, Brazil, Germany, India, Ireland, Lithuania, the United States, and Ukraine.
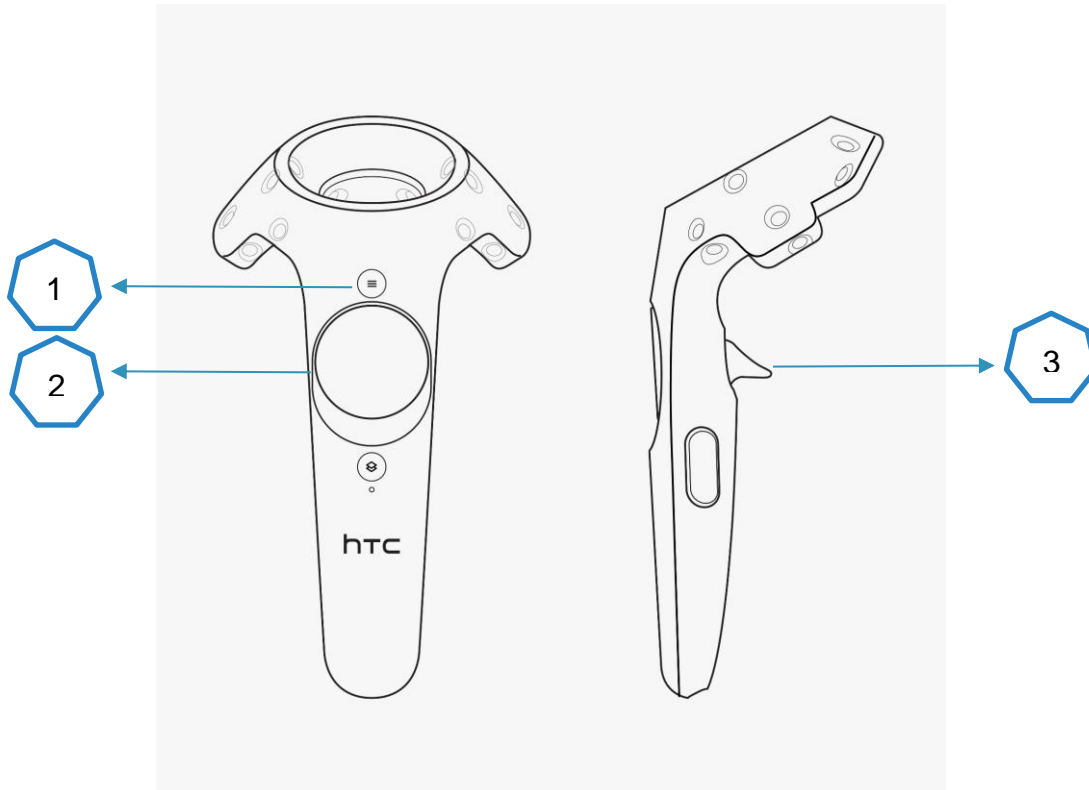
Application Overview

Movement:

- Walking is done simply and automatically using the headset.
- The direction of movement is determined by body rotation.

Gestures:

- <u>Jump</u>

  Jump is performed **by the user's physical jump**, the headset will detect a jump and translate it into a jump in the game. Simple!

- <u>Eating Balls</u>
    - Fireballs:

      Fireballs will hover in the air in order to eat them the user will **need to jump** and hit them. These balls allow the user to earn extra points.
    - Pink Balls:

The user will be standing next to the ball and **pressing button 3**. Clicking on the button will cause the ball to disappear and the user will know that the ball eating is done as required.

- <u>Eating ghosts</u>

  In order to eat ghost, the user must approach the ghost and **press button 3**, after eating the ghost it will disappear.

- <u>Menu</u>

  Pressing button 1, at any point in the game, opens a user menu.

- <u>Stopping the game</u>

  Stopping the game is done by pressing button 2. Repeating the button will return the user to the point where he stopped.

Manual

- <u>Menu screen</u>

  Press 'Start' in order to start the game or returning from pause.

  Press 'Reset Game' in order to reset the game and afterwards press 'Start' to start playing.

✓ **Movement**

The movement direction is determined by rotating your body.

There is a board map that displayed in the top of the screen for convenience.

✓ **Score**

You earn scores by eating elements in the game:

1. Eating Pink Balls
    a. Eat balls by pressing the 'trigger' button. For each eaten ball you get 10 points.
2. Eating Fire Balls
    a. This kind of balls is located high, and you need to jump in order to eat them.
    b. For eating a fire ball, you earn 50 points.
    c. After eating a fire ball, the ghost are entered to a 'struggle mode' for 30 seconds and you can eat the ghosts by pressing on the 'trigger' button.
    d. Also the walls are disappeared for 30 seconds.
3. Eating Ghosts
    a. As explained before, you can eat a ghost when it is in a 'struggle' button (by eating a fire ball).
    b. For eating a fire ball, you earn 1000 points.

✓ **Lives**

You have 3 lives for each game. When you are attacked by a ghost, you lose 1 life.

The game is over when you lose all the 3 lives.

✓ **Game Over**

The game is over when you lose all the 3 lives or you eat all the pink balls.