



User manual

Computer Graphics and Human Interaction
Computer

Universidad Nacional
Autónoma de México

Group 4

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Students:

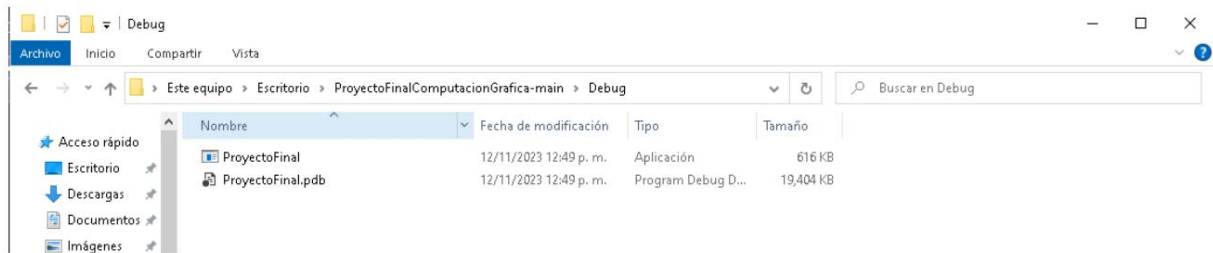
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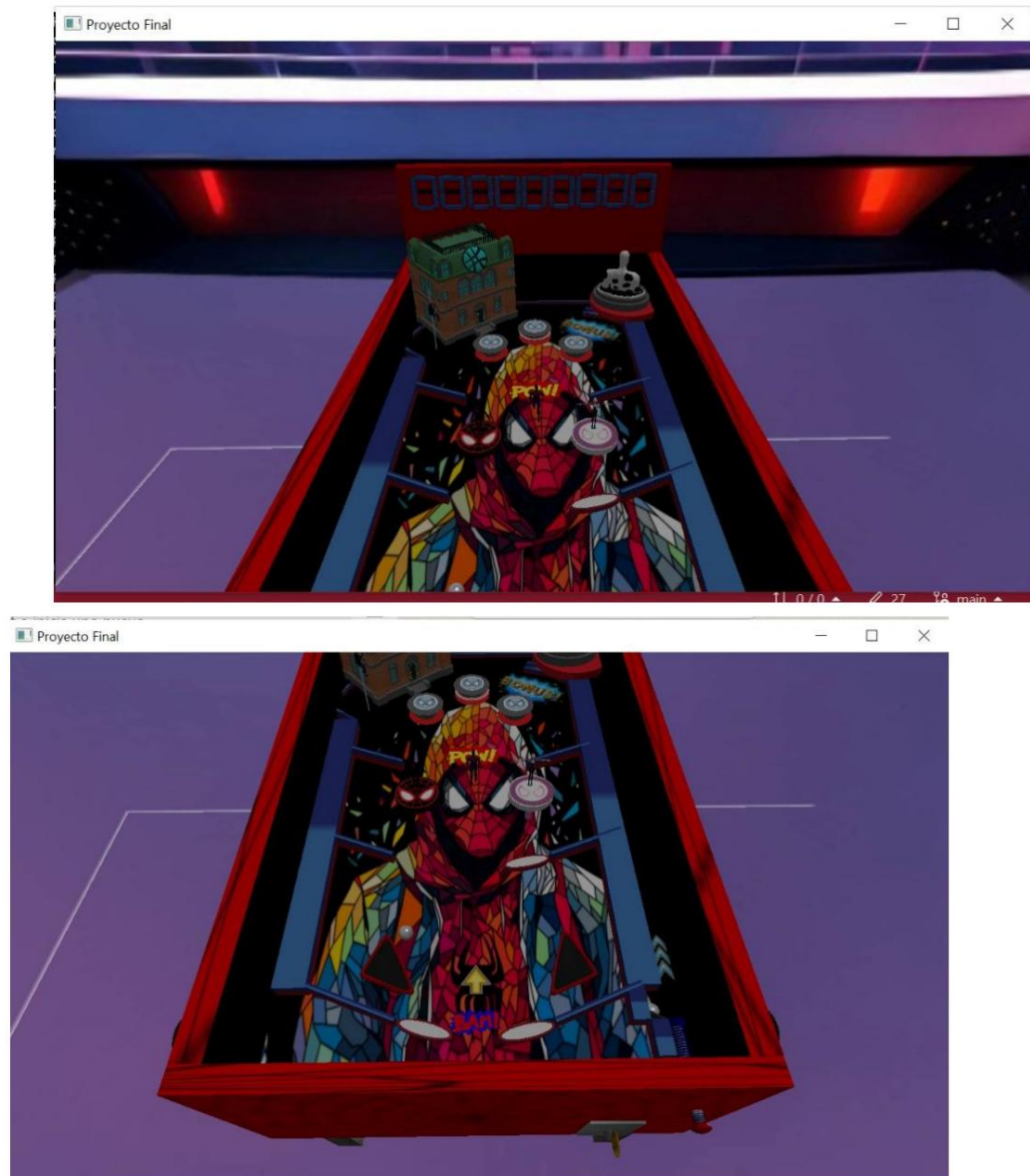
User manual

The project consists of a Pinball Machine with the theme of Spider-Man. Various objects were used to be able to give life and atmosphere to said machine. To run the program, you will only have to click twice click on the file with an .EXE extension to start working (The program load may vary depending on the capacity of the equipment we are running with, it may take minutes for the show board).



Once the program has been executed, the machine can be seen from a front point of view in which we can Note that some objects already have their respective startup animations. One of the Bumpers, the figure of Spot, the climbing Spiderman and the bases with the models of the main characters are found in constant movement. Spot's figure has an animation in which he is spinning around all the time. its axis (This speed cannot be varied during the execution of the program, only from the main code).

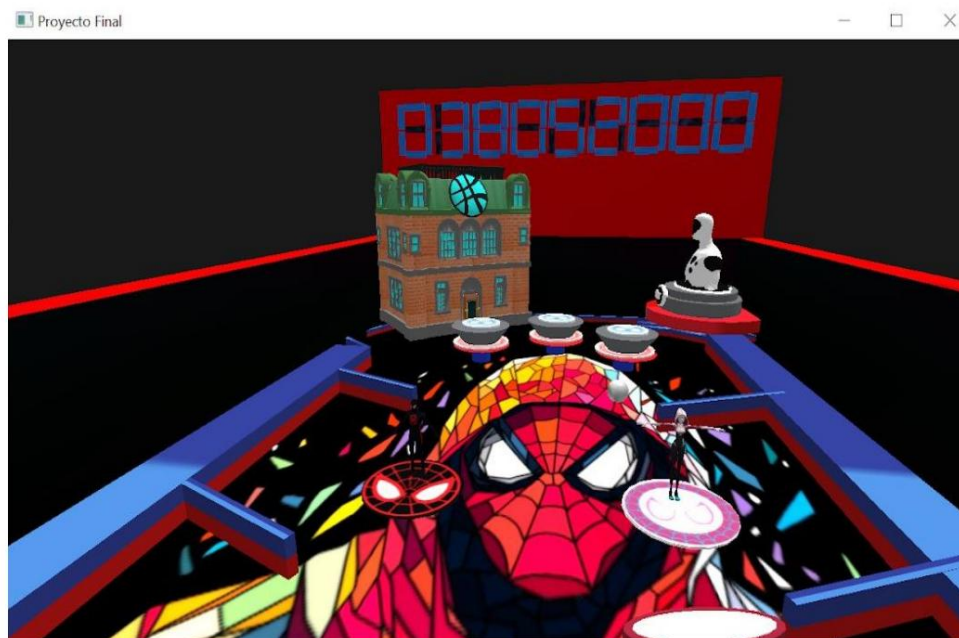
The Bumpers are 2 separate objects, one of those objects includes a tube with its stop and another is the skirt with the logo at the top, this animation does not need to be activated and we can see that the skirt goes up and down at a maximum height and a minimum height (same as in the previous case, the speed and maximum heights only can be varied from the code). The next object is the base that contains the Miles Morales logo and another with the Spider Gwen logo, this base will be found by making up and down movements with a lower speed than the Bumpers but with a much greater height, the attraction of these bases is that in the upper part contain the figures of the respective characters of the logo of their bases, a figure of Miles Morales and another of Spider Gwen and finally the figure of Spiderman has some arm and leg movements that simulate that it is climbing, to make the machine more realistic we put a tube as if this were the one that move the figure.



Let's now move on to the part of the objects in which we can activate with a key on our keyboard. First of all, we have 3 Flippers, two at the bottom of the machine and one at the top, these flippers They can be controlled in the following way: With the "Z" key we will activate the lower left flipper, with the "X" we will activate the lower right flipper and with the "C" key we activate the upper flipper. These flippers have a limit on its rotation of 45°, so regardless of how long we press the key, the flipper will reach its maximum point, when we stop pressing the key the flipper will return to its original position giving the sensation of a real machine.



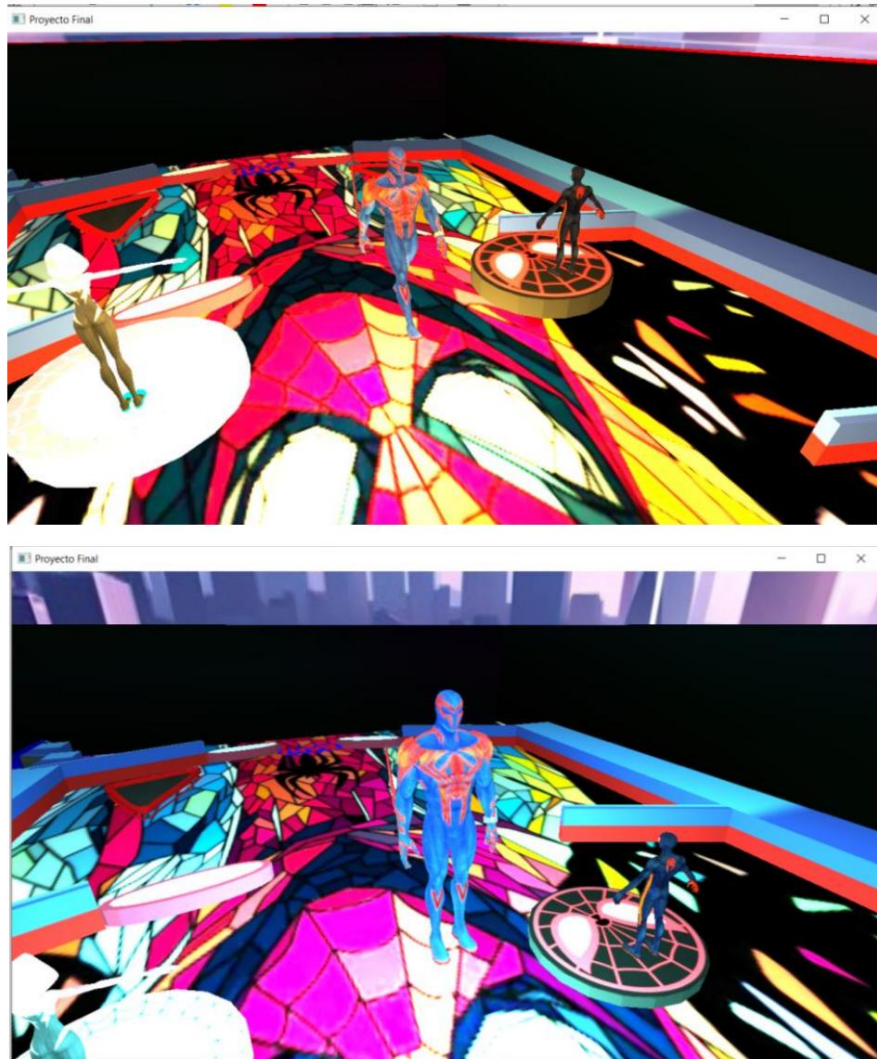
Another object that we can control is the first of the marbles, as we can see there is a marble that is located in the center of the board and has a preloaded animation of a route it follows, this animation is linked to the points section that can be seen at the top of the machine, to start the animation we have to press the “9” key and you can see how the marble begins to bounce on the triangular bouncers, climbs the bumpers, crashes on the edges of the board and finally returns to its initial position, at the same time we can see how the score begins to change. If we want to repeat the animation, first we will have to press the 0 key to reset all the values and later we can press the key again.



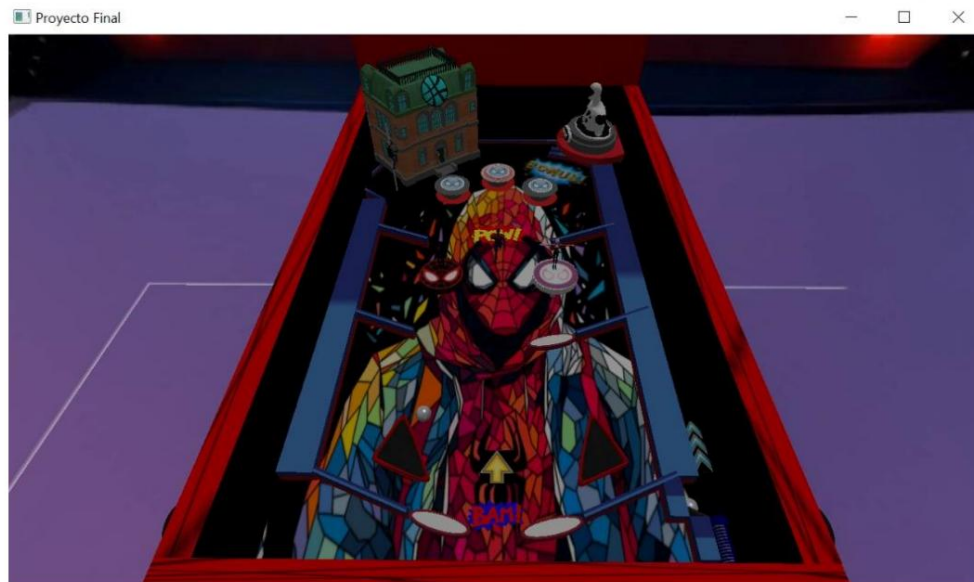
Now that we mentioned how to activate marble number 1, we can explain how to activate marble 2, unlike of the first, this marble starts from the spring and the lever like in a normal Pinball game, this animation It is linked to both the spring and the lever so that when activated we can see how the lever moves towards back and how the spring contracts. This animation starts with the Right Mouse Button, when the marble It shoots out and makes a cleaner path than marble 1, since it enters the Sanctum Sanctorum, it leaves there. itself, it starts to bounce off the edges of the board and ends up between the two flippers so that it returns to its position initial. When this sequence of movements ends, we can activate the marble again and it will come out in a different route, now colliding with the bouncers and one of the walls, so that it returns to its initial position.



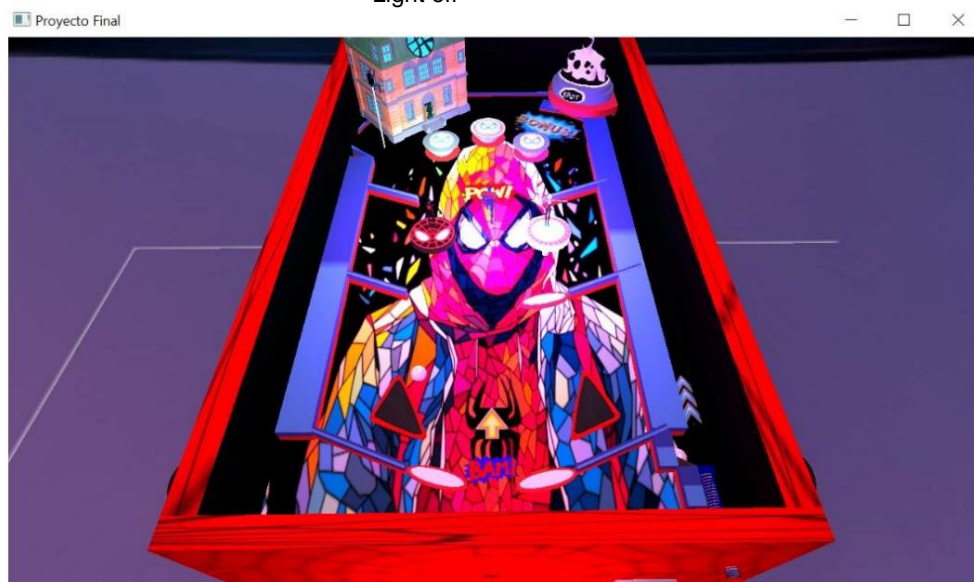
Inside the board we will find an avatar, set in pinball as the character Miguel O'Hara, who We can move with the WASD keys within the range of the board. When these keys are pressed, it will perform a walking animation, which will stop when we stop pressing any of the keys.



The dashboard has relatively opaque ambient lighting so that only what is necessary can be seen. of the details that we have inside the machine, but also to be able to go to the next level we will have the following 4 keys that will allow us to play with lighting. H Key: Will turn on a light between both flippers red, J Key: It will turn on a light on the left bumper, green J Key: It will turn on a light on the blue right bumper and L key: It will turn on a very bright light in the center of the machine that will go constantly changing color to illuminate the entire board.



Light off



Light on

Finally, while the program is running we will hear two simultaneous music tracks: the first will be the Spiderman 2099 theme song, which is placed as background music, and in the distance we will hear the Sunflower theme, placed as positional audio.