Assignment 4

3D "Super Bug Zapper" – Bacteria Growth, Interaction and Scoring

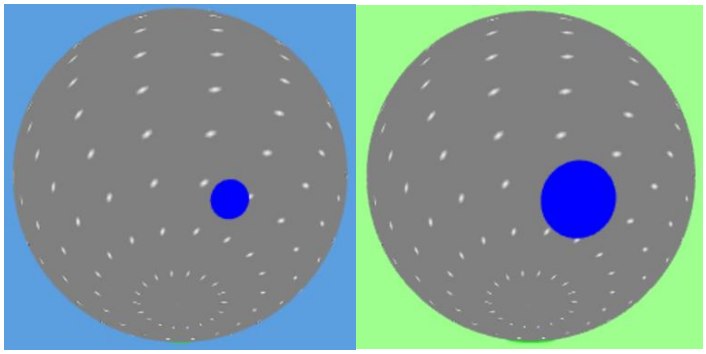
This is an individual assignment. This assignment is marked out of 10 points.

Due Date: April 5 Friday, 2024, 11:59PM

Following Assignment 3, use WebGL and JavaScript (but not three.js), and the mathematics package that comes with the textbook, to finish the three-dimensional interactive game "Super Bug Zapper" with the following new features:

[4 point]

1. Bacteria grow on the surface of the sphere starting at an arbitrary spot on the surface and growing out uniformly in all directions from that spot at a speed determined by the game.
2. The bacteria appear as a colored circular patch on the surface of the sphere.



(Please ignore the background color in the image)

[2 point]

3. The game can randomly generate up to a fixed number (say 10) of different bacteria (each with a different color).

[2 point]

4. The player needs to eradicate the bacteria by placing the mouse over the bacteria and hitting a button.
5. The effect of the poison administered is to immediately remove the poisoned bacteria.

[1 point]

6. The game gains points through the delays in the user responding and by any specific bacteria reaching a threshold (for example, a diameter of a 30-degree arc on a great circle of the sphere).

[1 point]

7. The player wins if all bacteria are poisoned before any two different bacteria reach the threshold mentioned above.

For the students in COSC519I only:
You will get maximum [4/2/1/1/1 points] for the above features. The remaining [1 point] will be given to one of the following features:

A. The effect of the poison administered also propagates outward from the point of insertion of the position until all the bacteria are destroyed.
B. When two bacteria cultures collide, the first one to appear on the surface dominates and consumes the later generated bacteria.
C. Lighting is used. Use GUI control to enable or disable lighting.

Submission:

Electronic submission of source code and documentation will be through Canvas:

1. Submit everything as one zip file to Canvas.
2. This .zip file should contain all your source files plus the files specified in 3 below and the files should be correctly placed so that the program runs from a browser.
3. Include in your submission two .doc (or .docx or .pdf) files: one for a user guide and one for a gallery of screen captures (with at most a 3-line explanation of each image). The screen captures should be complete and illustrate all aspects of the assignment requirements sufficient for marking needs.