

# GAME TECH

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CSC8503 COURSEWORK DOCUMENTATION

All the tasks in part 1 are implemented.

The tasks in part 2 that I implemented are listed below:

- Apply a collision counter for each of the airborne objects. After a given number of collisions, it will explode or shatter. Its remnants might have their own physical representation, causing further collisions.

- # The collision counter is not only for the airborne spheres but for the projectiles as well, given number of collision is 5 and it will shatter into 27 spheres, each of them flying to a different direction with the group speed before the object shatters. Remnants will cause further collisions.

- Optimize your collision detection implementation to maintain high update rate

- # Used Sort and Sweep for broad phase culling, greatly reduced the number of collision detection made. Use Key 'B' to turn it on / off to better see the difference.

- Implement an intelligent, dodging entity within the simulation which attempts to evade the projectile.

- # The dodging entity will not move until an active object is close enough to 'endanger' it. It will move faster if the object gets closer or approaching quicker.

- Implement the ability to control the size, shape or speed of the projectile.

# Have the ability of control the size and speed of the projectile, but not the shape. This is because this physics system is based on implementing every possible combination of the collision type such as sphere-sphere or sphere plane, other than use GJK method, which is more commonly used in industry. The time is already not enough to re-build the system from the beginning when this problem is noticed.

However, an inelegant but rather believable heightmap-sphere detection is implemented without GJK. I really want to highlight it out because the time it consumed.

- Objects might re-spawn a given time after they are destroyed.

# Destroyed objects will re-spawn after 5 seconds, which can be set through a pre-defined variable in PhysicsSystem class called SPAWN\_TIMER.

- A more complex scoring system, possibly related to the velocity at which objects collide.

# The score is related to the relative speed between two sphere when they collide.

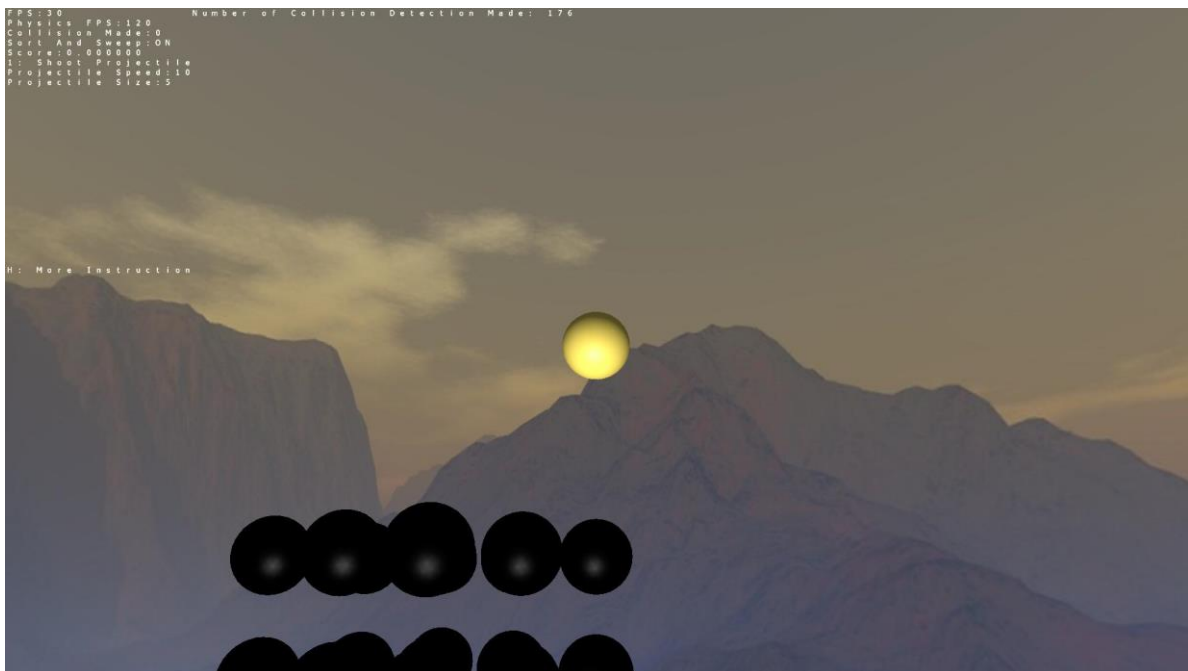
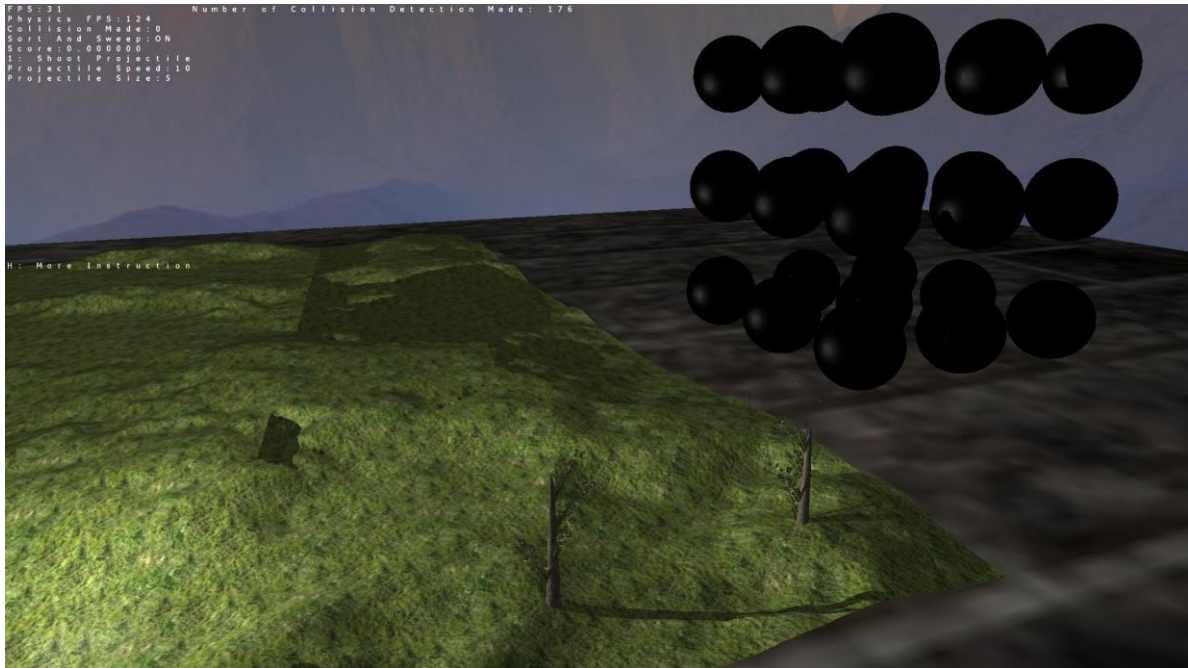
Video:

Demonstration Video is uploaded to Youtube and can be access using the URL below:

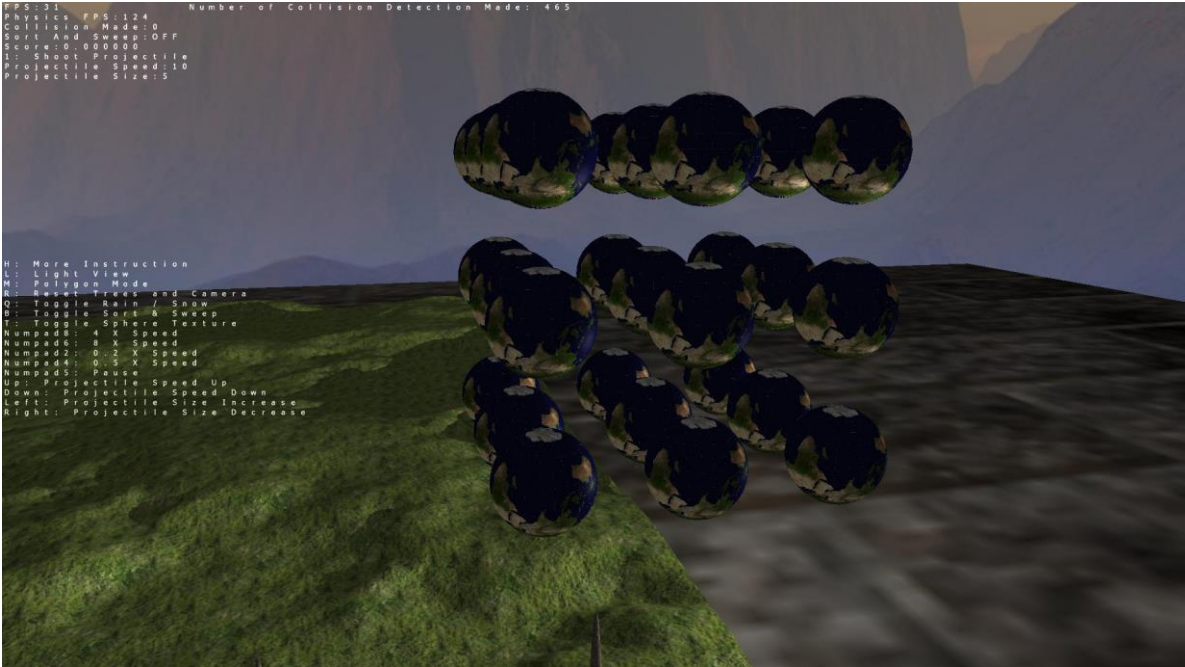
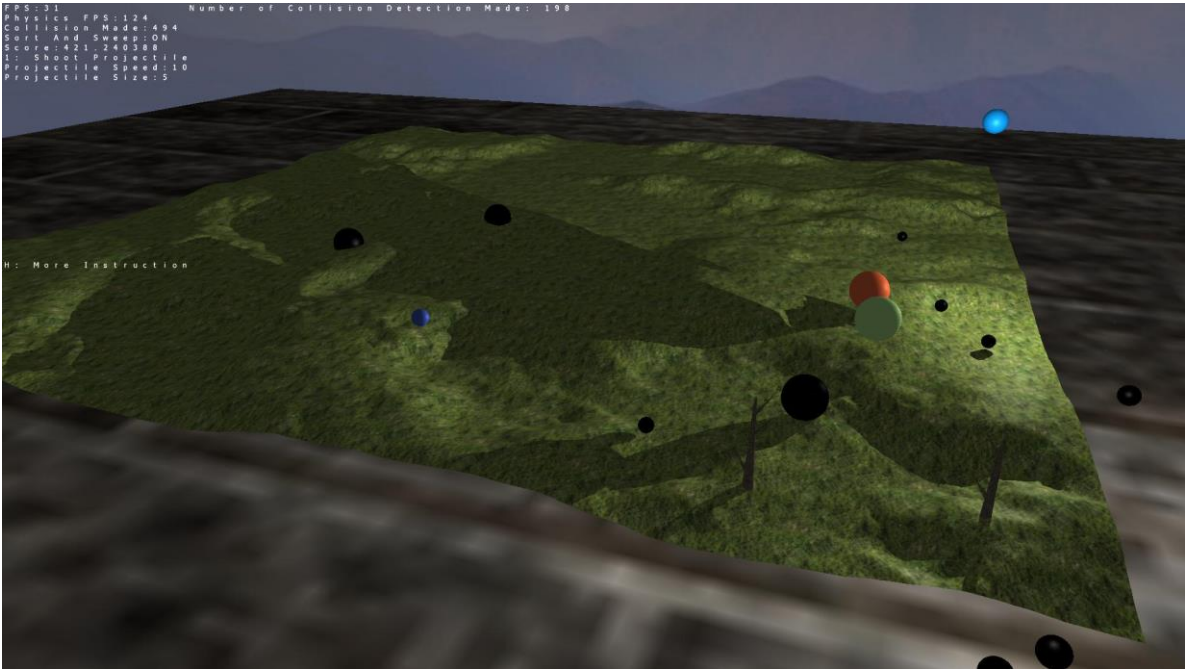
<https://www.youtube.com/watch?v=pUgDaZ4UjiU&feature=youtu.be>

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Screenshots:



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