6/9/2016

Assignment task 4 3D alpha game

32004 – Game Programming

Group 3

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# How to play

Basic control:

* Use W/S key to move the main tank forward/backward
* Use A/D key to rotate the main tank
* Move the mouse left/right to rotate the turret
* Move the mouse up/down to rotate the canon
* Press left mouse button to fire

Game mechanics:

* Every 10 seconds, an enemy tank is spawned on a random place on the map. The spawning stops when there are 12 enemy tanks on the map.
* Every tank (both enemy and player’s tank) has 100 HP, each time a bullet hit a tank, 20 HP is deducted. Which means each tank can withstand 5 bullet hit before being destroyed.
* Each time an enemy tank is destroyed, the player get 10 points.
* The objective of the game is to stay alive and destroy as many enemy tanks as possible. When the player’s HP reach 0, the game is over.

# Technical feature

|  |  |  |  |
| --- | --- | --- | --- |
| Step | Feature | Desired Mark / Maximum Mark | Justification |
| 1 | Basic world that contains:   * A 3D map * multiple 3D objects * a camera | 3/3 | The game has meet every requirements of this feature |
|  | Input   * Able to obtain player inputs and react to them | 1/1 | The player input can also be configured easily if needed |
|  | Physics: collisions   * Basic inter-object collision detection and reactions | 4/4 | Successfully implemented Oriented Bounding Box, which is more precise than Bounding Sphere or Axis Aligned Bounding Box. |
|  | Audio:   * Sound effects * Background loops | 2/2 | Sound effects: when tank fire bullets  Background loops: BGM |
|  | Modular Code | 3/3 | Game classes are grouped into corresponding folder/namespace.  Composite design pattern, which enable component-based architecture. |
| 2 | Physics: Kinematics | 4/4 | Natural object movements: tanks cannot move diagonally. They can either move forward/backward  Natural camera movements: camera always follow the player’s tank |
|  | A playable game that has   * Objectives * Conflicts * Scoring | 3/3 | Objectives: destroy as many enemy tank as possible  Conflict: player tank vs enemy tanks  Scoring: player gain point when enemy tank is destroyed. |
| 3 | [BONUS] AI: Steering Behaviours | 3/3 | Enemy tanks are implemented the following steering behaviours:   * Wandering: when the player is too far away. * Chasing player: when the player is nearby. * Avoid obstacle: avoid other tanks as well as other obstacles on map |

## Other technical features

Use custom shader (HSLS) to achieve the following effects:

* **Multi-textured height map**: the map texture is determined by the height at map position. Textures are blended at certain heights to achieve smooth look-and-feel.
* **Water technique**
* **Day & night cycle skybox**: the skybox’s texture will change during playing time. Skybox’s textures are also blended to achieve smooth texture transition.

# Peer evaluation

|  |  |  |
| --- | --- | --- |
| Team member | Cuu Son Dang – 12129565 | Huy Cat Hoang – 11940653 |
| Roles | * Create basic world map * Physics: collision * AI * Game objective, conflict & scoring * Custom shader (HLSL) | * Physics: kinematics * Input * AI * Game objective, conflict & scoring * Audio |
| Score | 5 | 5 |

# References

Tank model and BGM are provided on UTS Online.

Multi-textured height map and water technique tutorial: <http://www.riemers.net/eng/Tutorials/XNA/Csharp/series4.php>