DIPLOMA IN GAME DESIGN AND DEVELOPMENT

MD234Z GAME PROGRAMMING 4

Class: DGDD/FT/3B/31 & 32
Session: AY2019/2020 Semester 2
Release Date: Term 4 Week 2, 14th January 2020
Submission Date: Friday, 28th February 2020 at 9:00am
Critique Date: Friday, 28th February 2020 at 9:00am
Critique Venue: SD501
Weightage: 30%
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Graded Assignment T3: Develop a Multiplayer Game using Unity and Photon

A multiplayer video game is a video game in which more than one person can play in the same game environment at the same time, either locally or over the internet. During its early history, video games were often single-player-only activities, putting the player against preprogrammed challenges or AI-controlled opponents, which lack the flexibility of human thought. Multiplayer games allow players interaction with other individuals in partnership, competition or rivalry, providing them with social communication absent from single-player games. In multiplayer games, players may compete against one or more human contestants, work cooperatively with a human partner to achieve a common goal, supervise other players' activity, co-op. Multiplayer games typically require players to share the resources of a single game system or use networking technology to play together over a greater distance.

1.0 Objectives

1. To design and develop a multiplayer game using Unity and Photon (PUN2) through demonstration of programming to incorporate game mechanics, features and gameplay.
2. Apply the fundamentals of computer networking.
3. Apply the fundamentals of coding, data structures, mathematical concepts, level design and construction using Unity.

2.0 Game Requirements

For this assignment, you are required to:
- Create a multiplayer game (2D or 3D) of any genre using Unity and Photon (PUN2).

Demonstration in gameplay features design implementation through understanding of coding techniques that display:
- Server and client setup and connection.
- Spawning of networked objects.
- Displaying player names above the player characters.
- Synching values, e.g. synchronising character states, animations etc.

- Game Lobby implementation, including create room, join room, display room list/random matchmaking.
- Display connected users in the room.
- In-game chatting system implementation.
- Multiplayer game or multiplayer interactive application on mobile/AR/VR (bonus).
- Interaction control and display various forms of user feedbacks e.g. use of various casting techniques like Raycast, Linecast, Spherecast or Capsulecast, collider detection and event triggering.
- UI design with canvas display features.
- Use of audio source, listener and spatial effect for background music and sound effects.
- Transformation controls i.e. translation, rotation and scaling.
- Material control i.e. color, transparency, texture.
- Only 1 level design of multiplayer game is required.
- Duration of gameplay should at least 5 minutes.
- No restriction on number of camera used and manipulation
- Scenes minimally required are:
  1. Main menu containing Play, Instructions, Credits and Options.
  2. Level Completion menu and/or Win (Mission Cleared)/Lose (Mission Failed) screen
  3. Instructions menu containing all game mechanics and controls explanation.
  4. Options menu for controlling of background music or sound effects.
  5. Credits menu containing your particulars i.e. name, ID and class together with other assets taken from other sources.
- Use of appropriate visuals and sense of aesthetics to match game theme
- Commenting against written codes is required as demonstration of understanding

1. This is group graded assignment which constitutes **30%** of overall module weightage.
2. For group, team size should not comprise more than **2 members**.
   https://drive.google.com/open?id=141WtHCG9dUUHqNKECxq5AbIuxfN0TVJM1HuSSqIJLG4

3. Development platform is Unity.
4. Published game prototype must be runnable on PC platforms.
5. Ready or custom-made textures and 3D models are both accepted as game assets.
6. Submission date will be on **Friday, 28th February 2020 at 9:00am**. Submission channel is through Google Drive by sharing the download link via email (guo_jiayan@sp.edu.sg) containing **published executable game in *.EXE and packaged Unity project** containing <u>student name and ID in zipped format</u> i.e. Student Name (Student ID).zip. You are also required to **capture your gameplay** using Fraps or any other video capture software, and submit during the critique by uploading the video to the tutor's portable hard disk.
7. Critique date will be on **Friday, 28th February 2020 at 9:00am**. Venue is at **SD501**.
8. Weekly hands-on practice and in-class exercises do help you towards building up the game to be delivered. Hence, it is extremely important to make an effort to attend these lessons promptly.
9. Late or non-submissions and plagiarism will be awarded zero mark. Incomplete submission will be penalized for not fulfilling requirements.

3.0 Assessment Criteria

This assignment is based on the following assessment criteria.

Item	Category	Description	Weightage	"A" Grade Rubrics
1	Planning of systems	Clarity and systematic design in planning of game objects and prefabs to achieve game design requirements	15%	Efficient, systematic and clear organization of game objects and prefabs. Meets all of game design needs. Optimized, and allows scope to expand the game and level design.
2	Algorithms	Coding structures that perform intended behaviors	20%	Algorithm was implemented in the game code, for a variety of purposes. Everything was functional. The algorithm also demonstrates good optimization, and flexibility to handle changes or modifications.
3	Programming Syntax	C# syntax, use of keywords, flow control, condition checking, variables and program structure are correct and function as intended	10%	Game program runs. A good variety of syntax demonstrated. Clear understanding of syntax logic is shown. Coding is well-structured, very clear and concise.
4	Professional Practice	Use of comments, proper indentation, clear variable and function naming convention	10%	Good commenting throughout, and with clear planning, brief overview of intended function. Good naming convention applied, such that the intended purpose is understood

				immediately.
5	Game Design	Fun and Playability	25%	Game is fun and has high playability. Players want to continue playing after repeatedly testing and are hooked.
		Creativity and Innovativeness	15%	Clear visions of dream game with refreshing ideas. Extensive thoughts and effort placed in refining game concept and mechanics. Extremely original and appealing ideas with demonstration of development and evolution.
6	Visual and Audio Aesthetics and Appeal	Quality of overall layout and presentation	10%	Very strong in presentation style. All graphics and audio elements are very well developed and have excellent control layout, typography and sense of color. Design has good focus and match closely with theme.
		Total	100%	

WARNING!
- Plagiarism will be awarded zero mark and disciplinary action will be taken against offenders
- Work submitted within 1 hour after submission time will be awarded a PASS or FAIL
- Work submitted after than1 hour after submission time will be award zero marks
- Work will be awarded zero marks for student whose class attendance for the submission day is marked as absence