Complex Game Systems

PGDGSP6006 – Develop complex systems for real time applications.

Assessment Brief

SAG Document Link: https://aie.instructure.com/courses/1027/files/723198?wrap=1

Glossary of Task Words: https://aie.instructure.com/courses/1027/discussion_topics/2809

This subject requires you design, build, implement a modular complex system in a demonstration application. There are three stages: Design, Implementation and Integration, and Evaluation.

Design Stage: *01/05/2023 - 09/05/2023*

Task 1 Link: https://aie.instructure.com/courses/1027/assignments/8336

In this stage you are required to undertake self-directed research to design the concept for a modular complex system. The system must be able to be added to various projects to serve its purpose, the system can be created as either a statically-linked library (.lib), dynamic-linked library (.dll) or a redistributable source code that compiles into the project (such as a package that could be held on the Unity Asset Store or the Unreal Marketplace).

You will need to explain what is involved in your proposed modular complex system; this must include:

- *Identify* what your system is by name and description.
- *Outline* the *objective* and use of your system.
- If applicable, *describe* and reference any 3rd party libraries that your system relies on, otherwise *Identify* you are not using any.
- *Identify* and *Outline* the mathematical operations involve, allowing your system to function as intended.
- *Explain* what advance algorithm/s you will be implementing (*diagram/s could be used to help support your explanation*).
- *Illustrate* how your system should be integrated into an application.
- *Prove* how you will design your complex system to be modular. (*diagram/s could be used to help support your explanation*).
- Provide a reference list of the sites used following the Harvard Referencing method.

Naming Convention: *Yourname*_CGS_Brief.pdf

***Please note*:** Your modular complex game system must be approved by your trainer before you may commence the Implementation and Integration or Evaluation stages.

Implementation and Integration Stage: *08/05/2023 - 31/05/2023*

Task 2 Link: https://aie.instructure.com/courses/1027/assignments/8338

Once you have been approved, you will create and implement your modular complex system into a proof-of-concept/demonstration application, you will simultaneously create these for showcasing purposes.

The modular complex system must be functioning in your demonstration application as intended and specified in the brief. If you need to change minor portions of your modular system during this stage to meet your stated objective, you should record the alterations for the evaluation stage of this assessment.

- The modular complex system and the demonstration application must function error free and compile without any errors.
- The modular complex system must be packaged and ready to be redistributed.
- The demonstration application must run external to an IDE without errors.

Naming Convention:

1. *Yourname*_CGS_Asset_Source.zip
2. *Yourname*_CGS_Asset.zip/unitypackage
3. *Yourname*_CGS_Demo_Source.zip
4. *Yourname*_CGS_Demo_Release.zip

Extension task 1 (Optional)

To build a strong portfolio piece, it is recommended that you create a Readme/ Instruction document to explain to a user how they can implement and use your modular system. This could include one (1) or more of the following:

- Step-by-step instruction for a user to implement.
- Explanations of how to use the system features. Including diagrams and examples.
- XML comments to explains through hover over in the IntelliSense of functions, classes, etc, where applicable. (This is included as part of writing your code).
- If working in an engine, creating custom inspectors and/or tabs for usability.

Extension task 2 (Optional)

It is recommended that you create multiple demonstration applications that can showcase the modular complex system being used in a modular way for different projects.

Evaluation Stage: *30/05/2022 - 07/06/2022*

Task 3 Link: https://aie.instructure.com/courses/1027/assignments/8340

In this stage you will write a Performance Evaluation Report.

The ai for this document is to be a stand-alone description and critical evaluation of the performance of your created system. You may find it useful to introduce the reader to your work by providing a brief overview of the system (as stated in your original brief) and the purpose and functionality/design of your demonstration application.

You will need to ensure that your evaluation, at a minimum, covers all the following points:

- *Identify* and *outline* what your final modular complex game system is.
- *Identify* any *issues* you encountered when creating and integrating the Modular Complex Game System identified in your Design Stage Brief:
    - *Account for* how you either overcame, fixed, bypassed, or avoided each issue identified.
- *Explain* any required changes you had to implement into the Modular Complex Game System for it to function for your outlined *objective*.
- *Illustrate* the performance of the implemented system:
    - *Outline* any optimizations included in your implementation and areas where improvements could be made.
    - The method of doing this will change on a system-by-system basis but will typically require you to benchmark your system against similar implementations. For example:
        - For an AI algorithm implemented on the GPU, compare and contrast against the same algorithm running on the CPU.
        - For a networking application, measure latency and performance across a range of network conditions.
        - For a procedural generation algorithm, an analysis of the algorithm's complexity or performance (with reference made to Big O notation) may be sufficient.

Naming Convention: *Yourname*_CGS_Report.pdf