Project Definition

* This document should contain an elucidation of the problem and the objectives of the project.
* The objectives stated here form a ‘contract’ and your final deliverable will be evaluated, in part, against these objectives.
* The deadline for submitting this document is **Friday noon in the first week of Block 4.**

**1.Student Name: Lunar-Skie Hackett**

**2.P-number: P2724211**

**3.Project Title: FPS Weapon Implementation and Animation Pipeline**

**4.Supervisor: Artur Machura**

**5.Introduction (max. 100 words):** This project will be a framework that a first-person shooter can be built with. It will include the tools to implement a variety of weapons with different functions, the set up for the first person view on a character controller that has already been developed, and the tools to apply animations that drive, or are driven by, gameplay based on the weapon the player is using.

**6.Aims (max. 100 words):** The project will explore the following:

* Animation in Blender
* Animation Pipeline from Blender to Unity via FBX
* Implementation of weapons driven by Scriptable Object data
* Viewmodel Animation systems for a First-Person Shooter in Unity
* Animations driven by gameplay events.
* Gameplay events driven by animations.

**7.Objectives (max. 200 words):** *A list of specific, measurable objectives. They specify all the work tasks to be undertaken to meet the stated aim. They will vary from project to project, as every project is different. Your final deliverable will be evaluated, in part, against these objectives.*

* To implement the gameplay for, and to animate, a set of five weapons, each with varying properties
  + All weapons will have an equip, unequip, and inspect animation.
  + Three will be ranged weapons. They will all have an animation for firing the weapon, and a melee attack such as a bash or strike with the butt of the weapon.
    - One will have a partial and empty reload animation.
    - The second will have different reload animations based on how much ammunition has been used.
    - The third will be “reloaded” after each shot and will therefore only have one reload animation.
  + Two will be melee weapons. They will both have multiple animations for attacking, and these animations will drive the gameplay events.
    - One melee weapon will have a charge attack. The player will hold the alternative attack/aim input to charge, and releasing will launch the attack.
    - The player will be able to block or guard with the other weapon alongside the attacks. Guarding will prevent the player from attacking.
* Design VFX for weapons to enhance the visuals.
* Design a User Interface to give more information to the player.

**8.Deliverables (max. 100 words):** *A list of your Project’s deliverables. Be specific. e.g. a vertical slice of a game with audio, combat system, inventory system, HUD, and cut scenes. Or a plug-in for an existing engine which adds X, Y, Z functionality. Include any relevant documentation (testing report, code documentation, etc) you expect to create.*

* Technical Design Document
* Vertical Slice for basic weapon function with simple animation (First Deliverable)
* Blender Source Files
* A sufficiently developed framework for a First-Person Shooter, compiled to DLL(s).
* Unity project containing the source files for the project and a demonstration scene.
* PowerPoint Presentation for Viva

**9.Schedule of Activities:** *Having defined the tasks to be undertaken in the list of objectives, you need to prepare a Project Plan to show how you intend to carry them out. You can have a Gantt chart or text-based information related to your project plan.*

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| --- | --- |
| Week | Tasks |
| 31/03/2025 (wk. 1) | Basic weapon function, raycast job scheduling |
| 07/04/2025 (easter) | WEEK OFF |
| 14/04/2025 (easter) | Weapon planning and model sourcing, first weapon animations |
| 21/04/2025 (easter) | Test export pipeline, iterate on animation cleaning. |
| 28/04/2025 (wk. 2) | UI for weapons + Prototype deliverable |
| 05/05/2025 (wk. 3) | Build demo scene, finalise animation for demo weapon |
| 12/05/2025 (wk. 4) | Animation swapping & projectiles |
| 19/05/2025 (wk. 5) | animation-driven gameplay & visual effects |
| 26/05/2025 (wk. 6) | Unique firearm – bespoke reload and cycle animations |
| 02/06/2025 (wk. 7) | Polish + optimisation pass |

**10.Requirements:** *Specific Hardware or Software you will be using e.g. Unreal Engine, GitHub, Jira, HoloLens, Nintendo Dev Kit, Maya, Visual Studio, etc.*Unity 6000.0.32f1, Blender 4.4.0, GitHub, Visual Studio 2022

**11.Research Hypothesis:** N/A

**12.Student Signature:**

**13.Supervisor Signature:**

**14.Date:**