CM2113 Coursework - Design Document

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Table of Contents

Mood Board

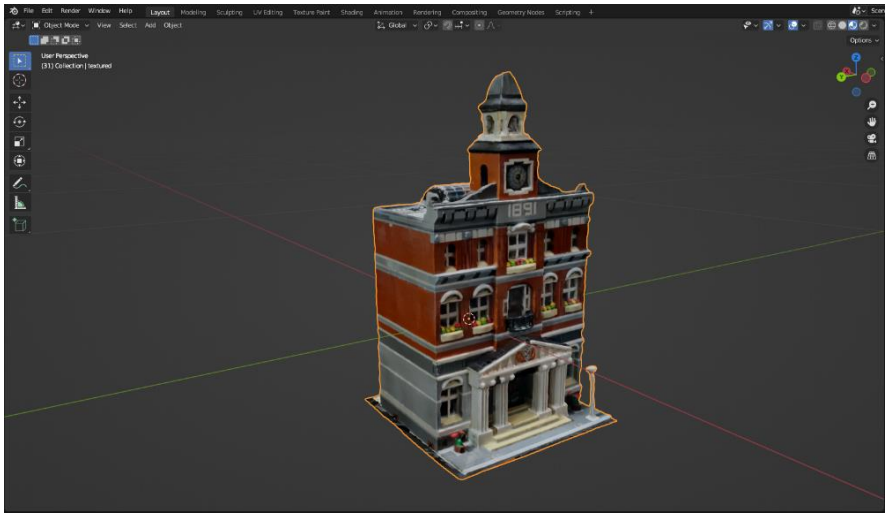
Project Plan

Date	Targets / Description of Progress	Design Stage - Implementation -
22/04/2023	Begin design stage - mood board and rough project plan	
23/04/2023	Details of game mechanics, scanned and imported Spider-Man toy into Unity	
24/04/2023	Functional Requirements, finalised project plan	
28/04/2023	Should have completed design stage and made progress towards implementation	
01/05/2023	Ideally around half-way through implementation	
03/05/2023	All coursework for other modules now complete, full focus on implementation	
04/05/2023	Have implementation completed, record video demonstration	
05/05/2023	Due Date - Submission	

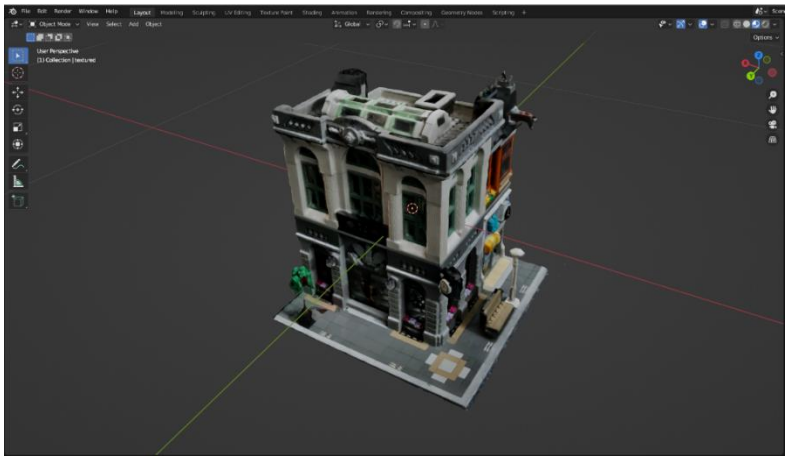
Diagram of Game Environment

Scanned Objects for Environment

Lego Townhouse

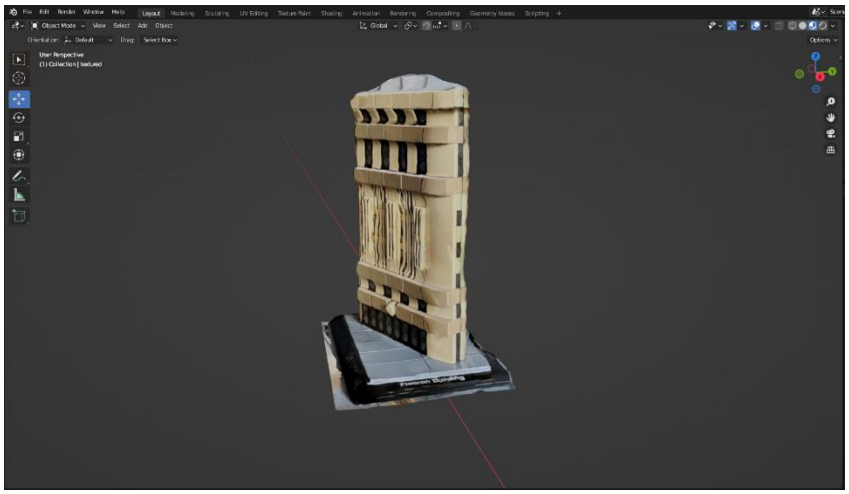


Lego Brick Bank

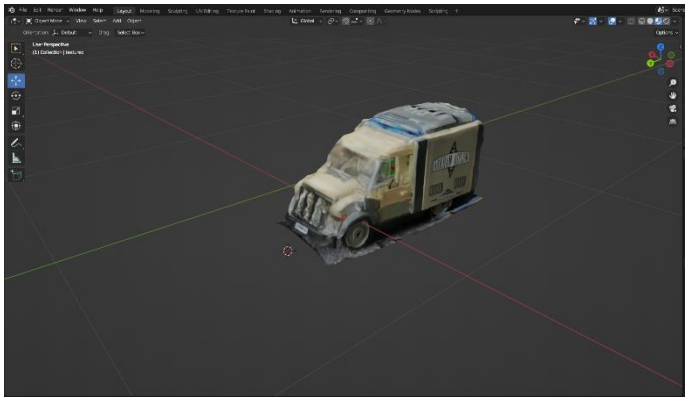


Lego Pet Shop and House

Lego Flatiron Building



Lego Arkham Asylum Van



Biped Character model

Spider-Man Toy

Details of Game Mechanics

Using Spider-Man as inspiration, the game naturally must feature web-swinging, wall-crawling, shooting webs etc… Spider-Man's powers. Swinging might be difficult, so is not a priority, but wall-crawling and jumping from building-to-building should be implemented as major game mechanics. It will be interesting to see if achieving a basic version of the Marvel's Spider-Man game on PlayStation and PC, is possible, or at least something resembling it.

In terms of gameplay, traversal will be the main focus. Spider-Man (The Player) will be tasked with getting around "New York City", avoiding or dealing with obstacles such as cars and enemies. Objects should have some sort of perimeter-sensing, so that cars play honking SFX when near the player and for a potential attempt at Spider-sense when near dangers that could harm the player. The game will be in third-person perspective, perhaps over-the-shoulder for shooting webs. If there is time, and it isn't too difficult, the game may feature a time limit and super-villains, to add some fun additional elements / challenges.

Requirements Analysis

Functional Requirements

Starting with the basics, many elements, including the character must be imported photogrammetry scans, and the player must be able to move, jump, swing, etc… To this effect, all animations and rigs must function correctly.

To deliver on the concept, different elevations in terrain will be required for climbing and jumping, and objects will need to have mass – The character must be able to jump or fall from rooftops, for example. The player must be able to interact with buildings / cars, requiring some form of collision detection and/or triggers, which could also be used to implement the perimeter sensor mentioned previously. Further, these interactions could cause Particle VFX – Perhaps for taking damage, or Spidey-sense.

In order for certain interactions to take place, e.g., the player making contact and pressing against a wall, or being pushed back by vehicles, the use of Rigidbodies and the Unity Physics system will be required. Vehicles must have more mass than the player. Buildings should have their positions and rotations fixed to prevent unexpected interactions – the player needs to climb up walls, and not push the buildings away.

Further, triggers will be required so that the player, and only the player, can climb objects marked as a building/wall. OnTriggerExit can be used at the top of a wall so the player doesn't keep climbing forever, and to stop the animation. Could layer another object so that the player can't climb when standing on a building roof.

Non-Functional Requirements

As for non-functional requirements, they are fairly standard ones, such as having clear, understandable UI and easily readable fonts. UI elements shouldn't be too big and there shouldn't be too many – it would look distracting and cluttered at best, and could reduce performance at worst.

Audio could also be included, with perhaps some royalty-free music and SFX, mostly for cars and Spidey-sense. A main menu of sorts may also be included, with the option to mute the audio, which may require some kind of pause function. It could be argued that these are functional requirements. However, as the main intention of the coursework is to demonstrate the ability to work with 3D models scanned using photogrammetry as opposed to more linear games development, they are being considered as added extras, and non-functional.

References

- Music - "Tech Live" Kevin MacLeod (incompetech.com) Licensed under Creative Commons: By Attribution 4.0 License http://creativecommons.org/licenses/by/4.0/
- SFX – "horn, hooter" from specrad1 on Pixabay.com
- VFX – "WispySmoke01" from Thomas ICHÉ on the Unity Blog
- Imported Rigs, Camera and Idle animation – "Starter Assets – Third Person Character Controller" by Unity Technologies
- Mixamo animations and rigs:
  "Thriller Part 3"
  "Swing To Land"
  "Running"
  "Jumping"
  "Look Over Shoulder"
  "Climbing Up Wall"