Kieran Bowsher 19036291	Neural Volume representation of volumetric cloud rendering		
Date	Tasks set	Outcomes	Questions
14/10/2021	Research raytracing	Made notes about sources that were researched.	N/A
21/10/2021	Research Neural Radiance Fields and Neural Volume representations	Made notes about sources that were researched.	N/A
28/11/2021	Draft proposal document	Made a draft of the proposal.	N/A
04/11/2021	Show supervisor the draft and finalize the document.	Improved document from feedback and finalized the document.	What elements of the report need to be improved?
11/11/2021	Focus on other coursework	N/A	N/A
18/11/2021	Create basic volumetric rendering in Unity using 3D textures.	Did not make a start since other coursework had to be worked on.	N/A
25/11/2021	Carry on with creating volumetric rendering.	Progress made on project	Should the rendering be done inside a physical volume, or one made by the shader?
02/12/2021	Start on research report.	Made a basic draft of the report	N/A
09/12/2021	Carry on working on research report.	Made more process on the report. Discussed the project and how certain elements should be approached.	N/A
16/12/2021	Carry on working on research report and finish it.	Finished research report	N/A
3/02/2022	Had a discussion on how to implement the neural network and the data that it will train on and to start making it.	Looked more into Py torch and started creating the C++ script to generate 3D points.	How to detect if a point is within a mesh?
10/02/2022	Continue working on dataset and neural network.	Carried on working on dataset. Still looking into Py torch and neural networks	N/A

17/02/2022	Carry on working on point generation.	Fixed point generating and now they generate inside mesh.	Explained that I had an issue with points generating outside of mesh How would I get the neural network to read my dataset?
24/02/2022	Fix some issue with point generation.	Any issues with point generation are now fixed.	
3/03/2022	Export dataset to python.	Dataset exported and read as Json	Question mainly related to issues of lack of information about getting a neural network to read a text file.
10/03/2022	Add a sanity check in unity to check if points do spawn within mesh.	Added a scene which loads the mesh and the dataset and spawns a sphere for every point to visualise all the points.	Similar question as last week. Should I change from using Json to CSV since Json is hard to work with?
17/03/2022	Change how the dataset is loaded and read from Json to CSV.	Changed the code so that the dataset now exports the CSV, and the neural network can read the CSV.	How would the neural network lean the density of each point?
24/03/2022	Get the neural network to train on the dataset	Added code to sample the CSV file and allow the neural network to train on it. Currently not working correctly	N/A
31/03/2022	Finish adding code so that neural network can train on dataset.	Finally correct and added the code that allows the neural network to sample the CSV file.	Most of the question related to how the weights and biases can be outputted to a text file
07/04/2022	Replicate the neural network inside a shader.	Started making process towards creating a shader that can replicated a neural network.	The question mainly related to how a shader can replicate a neural network and how to send the weights and biases to that shader

14/04/2022	Continue working on neural network inside the shader	Mainly continue working on the shader and fixed issues. However, there are issues with rendering	N/A
21/04/2022	Continue working and fixing neural network inside the shader	Change how the volumetric clouds render by rendering them in passes similar to other implementations.	N/A
28/04/2022	Sanity check if the shader works by creating a C++ script which replicates the shader and debug its outputs	Added the C++ script and checked the outputs. All outputs were negative which means nothing will render. Re-training the neural network fixes this.	N/A