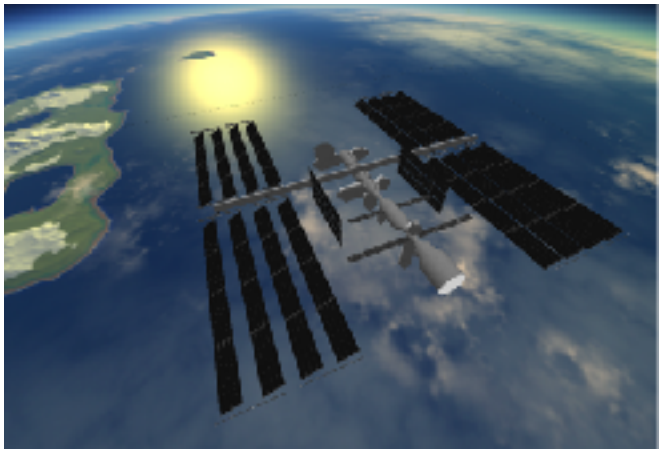
G53GRA Coursework
By Dovydas Ciomenas (ID: 4257350)

Displays a virtual scene with three or more different 3D objects (3D modelling / hierarchical modelling.

The model that I have built using hierarchical modelling is a replica of an International Space Station. It is made out of several objects built into one (as the ISS is a complex and large model by itself). The base of the station is built using modules. The modules are made by combining cylinders and circles to make the base cylinder and the ends of it and finally the circles to fill the holes in the module. The modules are then connected to each other in the way the real International Space Station is in real life. I tried to make it as realistic as possible within my time limit. The next are the solar panels which are all connected to either a supportive structure (which I have abstracted into a single cylinder due to it being a bit too complex in real life) or the base of the ISS. The big solar panels are connect to the big supportive structure at the top. The panels are modelled with rectangles as they are quite thin. The below image shows the real ISS and the model that I have made and their similarity.



The solar panels do change their position and rotation in real life. In my model, they change rotation for most of the panels.

Has some animated objects (animation).

The only animated objects in my scene are the solar panels. The big panels on the supportive structure (the cylinder) rotate to get the most sunlight by pressing the '-' and '=' keys. The other panels that are connected to the base of the ISS rotate automatically (that is my own interpretation) and pressing '0' accelerates the rotation, while pressing '9' decelerates the rotation of the solar panels.

Looks realistic (lighting and texturing); Is set in a thematic, appropriate environment, e.g. with a skybox.

To make the scene look realistic, I have created a skybox with images of the earth in the orbit. The model itself is at the centre of the skybox and the sun is at the edge of it, shining light at the ISS.

The ISS is textured, but the base is mostly white as it is made mostly of white fabric or aluminium, so I made the base texture out of aluminium. The solar panels have the solar panel textures. The whole scene looks like the ISS is orbiting the earth and the player is floating above it.

Allows user control, e.g. for viewing (keyboard and mouse input).

The scene allows user control provided with the framework. WASD moves the player and mouse interaction rotates the camera. The additional keys ‘-‘ and ‘=‘ rotate the solar panels, and ‘9’ and ‘0’ change the velocity of rotation for some of the other solar panels.

Reflection.

To build the scene, I had a lot of trouble with transforming the modules so that they seem to connect with each other, but mostly it just took a lot of time to accurately portray the ISS. The texturing could be done a little better, but since the ISS model is highly abstracted and the real ISS has many details, it would have consumed a large amount of time to accomplish that. The skybox has edges for a reason that I have not figured out, so I assumed that it is a problem on the graphical end and not my own, since models made on Visual Studio did not have this problem. Overall, I am happy with my work, I believe it is a fair replica of the ISS.