PROTOLAUNCH

The Company

At Protolaunch we are developing the next generation of chemical thrusters to meet the mobility demand of in space operations. Our thrusters are at least 50% more efficient than the next nearest chemical thruster, and can produce thrust levels far beyond electric propulsion systems

The Placement

The Placement was divided into two projects.
The first project focused on concept design work for the company's in-orbit-demonstration mission, and the commercial version of this. This also included making rendered stills and animations
The second project focused on the next iteration of the company's propellant delivery system, used for testing engines

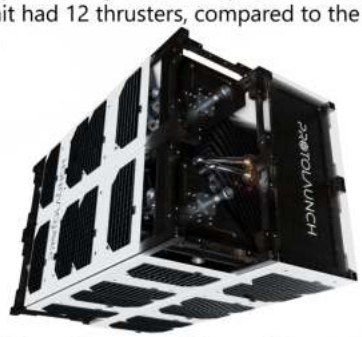
UK SPACE AGENCY

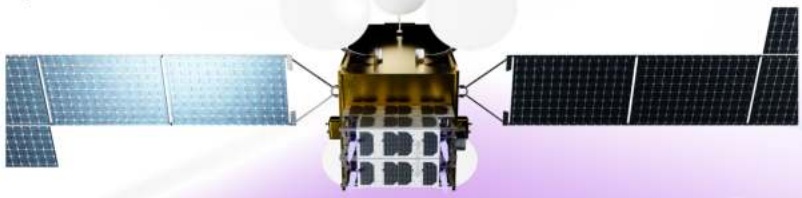
CATAPULT Satellite Applications

Project 1 - Concept Design and Graphical Rendering

To showcase the company's upcoming 3N hydrogen/oxygen engine, I was tasked with designing the concept of the In-Orbit-Demonstration mission of said engine. This meant creating a CAD model of the engine, based on values provided to me and integrating the engine into a 3U CubeSat structure. I would then implement the tubing, wiring and other components such as valves and oxidizer/fuel tank.

Learning from the IOD mission, Protolaunch will develop an off-the-shelf thrust package that can be implemented onto other satellites. Through three thrusters placed on four different corners, the satellite operator is able to move the unit while in orbit. This meant implementing the same system that was in the IOD CubeSat into a larger 12U structure. This had an increased complexity as this unit had 12 thrusters, compared to the single thruster system in the 3U.



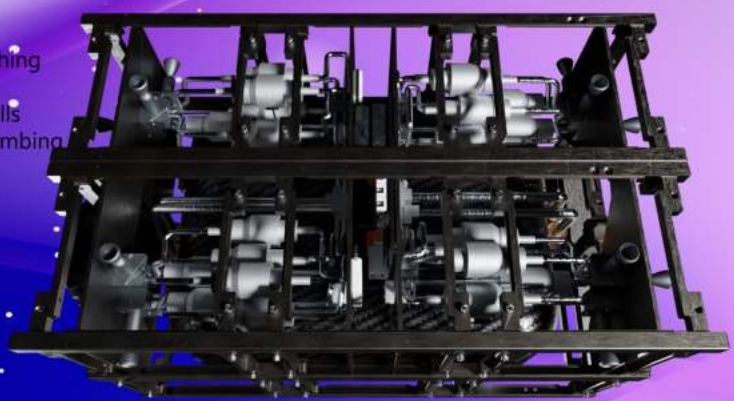


Project 2 - Propellant delivery system

In order to test our own engines as well as other clients' engines, Protolaunch has a custom propellant delivery system, used in these tests, at our test site. However, we currently only have one unit, and want to take what we have learned from building the first unit, do some minor alterations and build two more units. We also want to be able to sell these to other companies.
For my part this would involve creating CAD models of the new parts, such as the tank, find ways to integrate the new parts, add missing tubes, ID them and make bending diagrams of the tubing

Conclusion

During my 2 months at Protolaunch, I had the opportunity to experience how it would be like to work as a graduate engineer in the propulsion industry. I was set to work independently, researching and figuring out solutions to issues I came across, on my own.
During my time at Protolaunch, I got to continue to develop my skills within SolidWorks and Blender. I also got to learn about engine plumbing, bending diagrams, what it takes to develop chemical thrusters, and much more



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