

Thesis Portfolio

**Space-Based Solutions to Virginia's Roadway Problems
Real-Time Weather Data and Traffic Data Integration**

(Technical Report)

Understanding Space Technologies through *Mobile Suit Gundam: Iron-Blooded Orphans*

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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Spring, 2021

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Sociotechnical Synthesis

Space engineering is the backbone of many communications systems around the world, and in recent years the potential to surpass its current form is being pushed by both the public and private sectors. From SpaceX's Starlink to Virgin Galactic's space tourism, it is evident that there exists a demand for advanced space systems beyond what has already been explored. My technical capstone is to develop a spacecraft solution for transportation problems presented by MITRE, in particular truck parking for the first semester and weather for the second. The capstone demonstrates the accessibility and capability of spacecraft solutions, paving the way for more reliance upon space systems to solve terrestrial problems. However, further expansion into space will bring about other complications, and the STS thesis dives into these potential concerns.

As humankind transitions into a spacefaring society, with space outposts or colonies, space industries such as mining and manufacturing, and expansive interplanetary trade, the intricacies of the macroscopic social order must be outlined to identify problematic relationships as a result of space technologies. This is achieved by considering human-cyber interfaces, advanced weapons, space mining, and energy-propulsion systems from the anime science fiction series *Gundam: Iron-Blooded Orphans* as they are discussed in parallel with real world equivalent technologies to encourage discourse around the social, political, and economic issues that surround these technologies. The STS frameworks of paradigm shift and political technology are used to identify how the technologies connect to the greater social systems.