

## **Thesis Project Portfolio**

**Design of a Light Attack Aircraft for the AIAA Undergraduate Competition**  
(Technical Report)

**Military Funding of 5G Technology and the Spin Around Concept**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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## **Sociotechnical Synthesis**

My technical project was the design of a conceptual Light Attack Aircraft which provided me with the initial inspiration of my STS research. We were designing what would theoretically be funded by and paid for by the military which caused me to ask is military funding of research of new technologies a bad thing or could it have benefits for both the military and society.

The technical project that I worked on involved the design of a Light Attack Aircraft capable of missions that would normally be done by a helicopter. There were many requirements the aircraft had to conform to including, but not limited to, payload capacity, takeoff/landing distance, and mission capabilities. The goal was to design a capable aircraft that would be a less expensive option than a modern day fighter jet. The design process started with each team member designing a rough model and then selecting the best aspects of each team members initial configuration. Several design programs were used to analyze aerodynamics, propulsion, capabilities, and cost. The majority of the time was spent on optimizing the initial configuration to meet and exceed the requirements put forth by the competition. The most important design aspects were the ability to takeoff and land in a relatively short distance and be able to carry the required payload. Aircraft such as the one we designed are an extremely important weapon today due to the jobs necessary of aircraft in the current war climate. An F-35 is an exceptional aircraft, however, for the fighting being done today it can be seen as overkill. Our aircraft was aimed at providing a fighter capable of doing the jobs necessary today at a fraction of the cost of advanced fighters.

The STS research paper was aimed at explaining why military funding of advanced technology can be beneficial not only to the military but to society as well. When I first began

researching, I believed large military funding into private companies to research advanced technologies for military use had the potential to be a negative for the advancement of society's technology. After initial research, though, I discovered that this was not the case and funding of research of advanced technology is beneficial for any parties involved. The spin around concept seeks to prove this by showing that numerous technologies can be discovered for civilian use in the process of researching military technologies and vice versa. I believe that research of advanced technologies is important for society regardless of where the funding is coming from. It is a mutually beneficial process in which the military gets what they want and the private companies doing the research gain useful knowledge of new technologies that can then be used to benefit society.

The work done for both projects was valuable to me and taught me a lot about how to approach a large design process and how you can have a different opinion on something after doing extensive research on it. I also learned that countless technologies are a result of military funding of research of advanced technologies and how beneficial military funding of research can be for society.