I am applying to WHAT PROGRAM at ENTER UNIVERSITY HERE to learn how to build novel solutions to problems that are emerging in the aerospace industry today. As companies work relentlessly to increase safety and reliability while simultaneously striving to decrease cost, noise, and emissions, skills based in computer science will prove paramount to the advancement of the industry. The industry recognizes this, and is moving toward automation and computer solutions to problems. I am fascinated with this shift, and I want to contribute to meeting these challenges. My goal is to be at the forefront of the emergence of automation and AI in the aerospace industry, and to be able to combine principles from WHAT PROGRAM with my mechanical engineering background to create state-of-the-art solutions in the aerospace industry.

There are many processes currently employed in the aerospace industry which could be vastly improved. For example, finite element analysis to determine expected component behavior takes a long time and uses a lot of resources. Because of this, emulation is becoming an increasingly popular as a computationally efficient way to compute expected part behavior. Across a design space, and based on a threshold for emulation variance error, the number of models and their locations can be optimized to reduce computation requirements. Regardless, creating these models based on multiple design permutations requires a lot of computing power (or a lot of time). This makes batch processing an amiable companion to model creation. Being able to utilize the performance of multiple processes at a time can reduce the time to create a large model from hours to minutes. Being able to efficiently work and communicate between emulation and batch processing systems, therefore, is one key driver to future aerospace design and manufacturing tools.

Another important driver to the strategic direction of the aerospace industry is machine learning. One implementation being discussed is in engine cycle fatigue. Based on the behavior during normal flight cycles, sensors can detect the performance of each stage of the engine. Using this data, one can determine the degree of wear on individual components, and from this extrapolate the time until an inspection is needed. If effectively employed, this can give airlines further notice for when they will have to ground engines for inspection, and will likely reduce the total down-time of fleets which would reduce the price for air travel and increasing engine reliability. Effectively making use of machine learning principles to be able to accurately anticipate problems such as cycle fatigue before they become threatening to the operation of the engine is an important and challenging consideration for cutting-edge aerospace companies today.

These are just some examples of how skills at the intersection of WHAT PROGRAM and aerospace engineering will further the aerospace industry. There are many more, and problems will continue to emerge. With a combination of skills in aerospace and WHAT PROGRAM, I hope to be able to effectively manage these problems and to dictate the direction of proposed solutions.

During my undergraduate career I was able to explore problems at the intersection of WHAT PROGRAM and mechanical engineering. My freshman year I took a lab in MATLAB and Arduino, where I learned the principles of controlling mechatronic systems. Upon my completion of the course, I was offered and accepted a position as a Teacher’s Assistant for the class, where I got the opportunity to build and maintain the systems used in lab, as well as help other students through wiring and debug issues. Building off this early experience in my college career, being able to write code was a driving factor to my success in control systems and control systems lab and my ability to design controllers to increase performance of complex dynamic systems such as an electro-magnetic levitation system and a VTOL (vertical take-off and landing) fan system. For my research in orthopedic healing of tibia fractures my senior year, I wrote a program which automatically generated novel plots that overlaid theoretical tissue behavior based on hydrostatic and orthopedic strains on top of real world callus zones.

Add some stuff about the university. Talk about some programs or specialties that interest me. If they have a decent aero program, or any aero program, talk about it and how that was important to my selection process, as they are a university which balances my interests. yadayada

Another reason for my consideration of ENTER UNIVERSITY HERE is the robust online program offered. I want to simultaneously expand my industry knowledge by working on real-world, market problems, and expand my horizons through formal learning through a university. Completing a degree program online gives me the distinctive opportunity to achieve both, and directly apply knowledge to current industry problems in real-time.

In summary, my goals as a graduate student are to expand my knowledge of WHAT PROGRAM as well as computer system architecture to be able to solve next-generation problems in the shared space of WHAT PROGRAM and aerospace. As the aerospace industry continues to evolve, new methods will have to be implemented to face emerging challenges. Looking forward, I am excited to have the opportunity to these challenges as they emerge