I am applying to the Master of Software Engineering at Penn State World Campus to learn to build 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 software engineering with my mechanical engineering background to build state-of-the-art solutions in the aerospace industry.

One 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. This, in turn, would reduce the price of air travel and increase 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.

This is just one example of opportunity for emerging technologies that I have been involved with in my experience at Pratt & Whitney. During my work at Pratt & Whitney I have had the opportunity to contribute to projects focused on advancing design and manufacturing technologies. One project, DART, focuses on allowing engineers to get rapid feedback for compressor blade and IBR (Integrally Bladed Rotor) design changes. Another project, Airfoil 2.0, automates the inspection process for engine components, focusing on functionally acceptable geometries, rather than blueprint constraints, which increases engine reliability while vastly decreasing inspection costs. With a combination of skills in aerospace and software engineering, I hope to further be able to drive innovation to problems such as these, as those problems continue to change and evolve.

Another reason for my consideration of Penn State is the robust online program offered. People who have completed the program have raved about the slick online interface and the comprehensive courses. Additionally, 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 be able to directly apply learned knowledge to current industry problems in real-time.

In summary, my goals as a graduate student are to expand my knowledge of software engineering to be able to solve next-generation problems in the shared space of software engineering and aerospace. As the aerospace industry continues to evolve, new and innovative methods will need to be implemented to face emerging challenges in inter-discipline fields. Looking forward, I am excited to have the opportunity to face these challenges as they emerge.