I am applying to the Masters in Computer Science at Purdue University 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 computer science with my mechanical engineering and aerospace 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. An 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.

Purdue is an excellent university in both the aerospace and computer science disciplines, making it the ideal university to build the cross-discipline skills needed to succeed in the aerospace industry. Especially unique to Purdue is their commitment to research in computer science, as evidenced both by an expanding faculty and wide variety of research including the MINDS project and CSE research group. Principles from each of these projects are likely to impact the aerospace industry in the near future, making study at Purdue University a great opportunity to grow intellectually.

In summary, my goals as a graduate student are to expand my knowledge of computer science as well as computer system architecture to be able to solve next-generation problems in the shared space of computer science 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.