

Statement of Purpose

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From a young age the belief that an education is most valuable when it is used to serve ones community has been instilled in me. This conviction and a natural aptitude for science and mathematics convinced me astronautical engineering is the most fitting career for me. It is my goal to earn a PhD in Aerospace Engineering. Achieving this high level of scholarly work is not simply a culmination of a goal but rather the first step of a lifetime of service. A doctorate in this field would allow me to teach, conduct world-class research, mentor and develop a new generation of students, and finally make significant contributions to the technical development of our nation and the state of human knowledge. These goals have been fueled my collective experiences and have shaped the direction of my preparation and future aspirations.

My education at the Academy exposed me to the wide field of astrodynamics and I became very interested in control theory, dynamics, estimation, and orbit mechanics. I had several opportunities to apply this knowledge to problems beyond the textbook during the course of the senior rocket design class. However, it was only after becoming an officer and working did I receive a chance to observe the state of the art in astronautical engineering. As an Engineer at the Air Force Research Laboratory (AFRL) I have been exposed to the current technical challenges to the guidance, navigation, and control community. I worked on the orbit determination and space sensor characterization problem through the AFRL science experiment. In addition, I have extensive experience in the issues of implementing control and estimation algorithms on hardware. I used these skills to integrate a motion capture system, inertial measurement units, and momentum wheel actuators onto a spherical air bearing platform. I am very fortunate to have been able to work on such relevant technical challenges and deal with the current state of the art problems in the field. The ability to fuse education and current technical problems would be a huge benefit to my future graduate studies.

I further supplemented this education by pursuing a Master's degree from Purdue University. Focusing my coursework on control theory, orbit mechanics, and analytical dynamics have further cemented my desires to continually further my education. Completing a challenging graduate program while simultaneously working full time at AFRL was far from ideal. However, I am determined to supplement the hands-on experience gained from the laboratory with a quality education. As a result, I gained a level of discipline and work ethic that can only be gained by completing two full time professions, a graduate student and commissioned officer, at the same time. This experience will only serve to aid my future endeavors as I continue to pursue research and development in the astronautics field.

I hope to continue my education, gain experience, and continue research in this field. My interests in these fields have led me to applying to Purdue University. As a full time member of the Air Force a quality distance learning program in this field was very important to me. Purdue University allows me to continue my education and pursue my dreams while still working full time for the Air Force. I believe that the Aeronautics and Astronautics Department at Purdue University is the ideal place to complete my graduate degree. The expert faculty and highly regarded program make Purdue University a excellent opportunity to continue my studies. I can directly apply the information learned in my graduate studies to the current issues on operational systems for the Air Force. I plan applying the knowledge from this graduate degree to further advance current space systems in the Air Force. After my career in the Air Force I hope to pursue a doctoral degree and become a professor or work for the private industry. The combination of a world class education and applicable experience in a space related field would prove useful to a professor.