**Statement of Purpose**

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Watching documentaries about the formation of solar system and galaxies that entrenched a deep interest in me about outer space during my school years. The elite organizations and their feats such as ISRO and NASA missions to Moon and Mars: their ingenious rockets and spacecraft have inspired me to be a part of them. This led me to think about rockets and space vehicles that enable us to think about space travel and make studying these places possible. It was this thought that drove me to study aerospace engineering.

During my undergraduate program, I found Propulsion and Composites to be the most interesting subjects. However, the important subjects that made me understand the fundamentals and played a vital role in strengthening my decision of pursuing higher education in the space sector were Thermodynamics, Aerodynamics, Mechanics of Fluids, Structures, Compressible Fluid Flow, Avionics, Finite Element Methods, Spacecraft and Rocket Propulsion, Air Breathing Engines and Aero Design.

In the Low-Speed Aerodynamics Lab, I was part of a wind tunnel experiment where we had to build a wing to find the pressure distribution across an airfoil in low Reynolds number flow and in the Flight-Testing Lab, I worked on Waypoint Navigation Tuning for UAVs using MATLAB where I was able to apply theoretical concepts to practical scenarios. The Aero-Design Course tasked my team with creating the preliminary design of an amphibious search and rescue aircraft, which required us to dive headfirst into hydrodynamics and mechanics with no prior experience which helped me understand problem solving and pragmatic approximations. Even though I had no formal course about Design Thinking, I absorbed it by working with experienced faculty and insightful colleagues on multiple topics.

In my final year, I worked on a project that applied machine learning techniques to optimize an Expansion-Deflection (ED) nozzle. We designed axisymmetric ED nozzles with varying geometries using SolidWorks and meshed it using GAMBIT. We generated data from CFD analysis and used a Machine Learning algorithm to optimize it. We worked on enhancing its performance through rigorous testing and optimization using tools like ANSYS Fluent and MATLAB.

In July 2023, I had the opportunity to do my first internship in Srihari Kota High Altitude Range (SHAR), an organisation under ISRO where I got to learn about the various kinds of tests done on different parts of a rocket such as ignitor, crew module, nozzle, and AGNI motor before launching. This further propelled me to realise my strong interest in space which led me Luleå University of Technology’s Master Programme in Spacecraft Design.  Its strategic position and infrastructure make it an ideal site for space and atmospheric research and space technology attracting students and researchers from all over the world providing me with valuable international exchange with like-minded individuals. The elective streams I have chosen during my bachelor's degree also pertain to propulsion (Air Breathing Engines) and/or space (Rocket and Spacecraft Propulsion).

At this stage of my academic journey, I believe that pursuing a Master's degree in Spacecraft Design is the logical next step to deepen my knowledge and skills in this field. The experiences gained during my undergraduate studies and internships have provided me with a strong foundation, and I am now eager to engage in advanced coursework and research that will prepare me for leadership roles in the space industry. I am particularly motivated to address current challenges and contribute to the ongoing advancements in space technology.

Upon completion of the Master's program, I aspire to pursue a career in Propulsion systems in rockets and other spacecrafts where I can leverage the knowledge and skills acquired to contribute to advancements in the space industry. I aspire to contribute to transformative projects involving Sustainability in Space Exploration which advocate for environmentally sustainable propulsion technologies to minimize the environmental impact of space exploration activities. This could involve researching alternative propulsion methods, such as electric or nuclear propulsion, that reduce reliance on traditional chemical propellants. Looking ahead, my long-term goal is to assume a leadership role in space systems research and development in organization’s like ISRO, ESA, RUAG Space AB and Omnisys Instruments. I aspire to contribute to transformative projects that push the boundaries of space technology, potentially working on innovations in propulsion systems or contributing to the exploration of deep space. I envision myself collaborating with industry leaders, research institutions, and governmental agencies to shape the future of space engineering whether in academia, industry, or research institutions.

Several distinctive features of Luleå University of Technology make it my top choice for pursuing a Master's in Spacecraft Design like the fact that there is a collaboration with the Esrange Space Centre in Kiruna, which launches sounding rockets and large high-altitude balloons. This collaboration means that you can build your professional networks, tap into their expertise, and access modern research infrastructure. During the summer months, I will be able to take the opportunity to do research internships at a space company, space organisation, or a research institution.  The faculty at Luleå University of Technology includes some of the leading experts in Space Engineering. The state-of-the-art laboratories and research facilities will also provide an unparalleled environment for hands-on learning and innovation. The university's strong emphasis on developing fundamentals allows students to integrate various engineering disciplines and future-oriented technology, fostering a holistic understanding of complex engineering problems. Moreover, its collaborative research environment provides ample opportunities for students to engage in cutting-edge projects, gaining practical experience. Additionally, its connection to industries ensures that the knowledge gained during the program is not only academically rigorous but also directly applicable to real-world scenarios. Finally, the vibrant academic community at Luleå University of Technology, characterized by diverse perspectives and a culture of innovation, is conducive to personal and intellectual growth.

In conclusion, I am enthusiastic about the prospect of joining the esteemed program at your university and contributing to the rich legacy of innovation and excellence. I am confident that my academic background, research experience, and dedication to the field make me a strong candidate for admission to your esteemed institution.

If selected, I wish to engage in collaborative projects, participate in student organizations, and contribute to the rich academic tapestry of the institution.