

## Statement of purpose

My name is Srinivas Diwanji and I am currently pursuing Masters in **Aerospace Engineering** in **IIT Bombay**. I did my **B.Tech in Mechanical Engineering** from **IIT (BHU) Varanasi**. Throughout my academic career I have explored different fields and have been part of many varied projects. I was a part of a **25-member** team in IIT (BHU) and am currently a part of a **50-member** team in IIT Bombay. In addition to team projects and academic M.Tech and B.Tech projects, I have also done research internship and design and innovation projects. Grateful to the flexible academic curriculum, I was able to study a variety of subjects like CFD, FEM, Essentials of Turbulence, Composite materials, optimization, Introduction to ML, Molecular simulation, Turbomachines etc. With regards to academic performance, I scored **9.37 CPI** in my **B.Tech** and ranked **5th amongst 130 students** and I have a current CPI of **9.14** in my **M.Tech** ranking **10th among 60 students**.

For **2 years (Aug'16-Jan'18)** I was involved in a **IIT (BHU)** team which was engaged in '**Design and fabrication of an All-Terrain Vehicle**'. I got the hands-on experience on how to design a vehicle from the scratch and it allowed me to apply the concepts that I learnt in my course works. I became aware of the manufacturing processes and how to deal with the manufacturing problems and **assembly** of all the components. I got the opportunity to lead the team for one year as the **Vice-Captain** and as the **head** of the **Roll-Cage department** of the team. This project taught me how to approach different sorts of problems by dividing them into small segments in order to tackle them swiftly. I understood the importance of **teamwork, integrity** which also relates to any research group in an institute.

During my **two months (May'18-Jul'18) summer internship**; I got an opportunity to work in **IIT Kanpur**. I developed turbomachinery **loss models** in **MATLAB** and integrated them with an **analysis based meanline solver** to provide a **complete 1D design tool** for turbomachines. Turbomachinery course was not taught before my internship and I take pride in the way I was able to **grasp the subject** without anyone teaching it and to equally complete the work in **two months** duration. I enjoyed the work and it taught me how much **hard work, persistence** and **discipline** is required for the **research work**. I wrote a **research paper** on this internship work and presented it in **FMFP'18 (Fluid Mechanics and Fluid Power)** conference which was held in **IIT Bombay** and it got accepted for publication.

My **B.Tech** project was on '**Liquid cooling of a battery pack using nanofluids**', which helped me to apply my knowledge of **fluid mechanics** and **heat transfer** on a real-life practical problem. We designed a **scalable cooling system module** and performed **CFD analysis** on it. A proper guidance from my mentor taught me how systematically the **theoretical, computational** and **experimental works** are done to do a **well-ordered and documented research**. For me, **research** is an **endeavor which I truly enjoy**. It puts forth many challenges which I cherish and makes research enjoyable.

During my B-Tech course, I also did **two additional projects**, one on '**Piezoelectric Energy harvesting**' and another on '**Design and Fabrication of an Arsenic Removal Filter using IONP loaded PU foam**'. To achieve the objectives of the latter project, we had to study the chemistry involved in the purification process and we also collaborated with a Chemistry professor for synthesizing the iron-oxide nanoparticles using the in-house facilities.

It is during my Masters project that I am able to apply most of my learnings to get the maximum output possible. I am gaining the experience of going through all the research stages right from problem definition to research defence. Owing to good research methods and proper guidance, I am on course to completely achieve the objectives of my project especially in these challenging times. My M.Tech project is on '**Unsteady Flow Interactions in a Contra-Rotating Axial Compressor with Inflow Non-Uniformities**'. The project takes its motivation from an **innovative propulsion technology** used in '**Boundary Layer Ingestion**' engines.

Modern research problems have become interdisciplinary in nature. It is therefore necessary to expand our domains in order to achieve these breakthroughs needed to have a constructive impact on our lives. I am naturally motivated for a research problem based on its practical applications which can also be inferred from my previous projects. I get inspiration from the same to explore and confront the challenges which I truly relish.