

Statement of Purpose: Mechanical Engineering

Accepted at Arizona State University, MS in Mechanical Engineering (Specialization – Robotics)

In the summer of 2011, I attended national science camp, organized by Homi baba, government of India initiative. During this, I heard talks by prominent Indian scientist about latest research on astronomy and health care which invigorated my inclination to pursue applied science. This also motivated me to take part in an intra-school competition, where I highlighted brain's complex organisation and clarified certain myths about its inner functionalities using working model. Its ingenuity won me first prize in over two hundred participates and made my prediliction stronger to pursue a course in Engineering.

Taking up the speciality of Mechanical Engineering due to my affinity for mechanical systems and robotics, helped me bolster my technical acumen. Courses in them helped me understand design of electromechanical system in depth, and I perfected the art of C programming in numerous labwork. The subject on control system was instrumental to conduct MATLAB based modeling projects requiring independent reading, programming, simulations and technical writing. My constant endeavour to give my best efforts in any given situation earned me Narotam Scholarship, a prestigious programme which aims to promote scholastic excellence at the undergraduate level.

Due to my strong mathematical background, I developed strong interest in system dynamics and controls. To learn more about its application, I signed up for three courses namely Aerial Robotics, Robotics Mobility and Computational Motional Planning on Coursera. Motion Planning expounded on the topics like graph-based methods, randomized planners and artificial potential fields. Mobility kinematics delved in intricacies of non linear dynamics. Due to Aerial Robotics, I was able to develop dynamic models, derive controllers, and synthesize planners for operating in three dimensional environments. The key learning from these myriad mix of courses upgraded by acumen of linear controllers for Unmanned Aerial Robotics (UAVs) and path planning algorithms.

To strengthen my theoretical knowledge, I volunteered for my college's Baja team, who were building an all terrain vehicle (ATV). I gradually learned the basics of steering geometry and its underlying mechanism and got promoted to lead team of 5 student to design, simulate and manufacture a roboust but light weight steering assembly. By reducing the turning radius, we were able to achieve our objective and also attained weight reduction of about 50% in overall steering assembly due to strategic inclusion of low density materials and carbon fibre.

Meanwhile, I was also allured by vehicle dynamics and its various concepts like transitory stability and G-G diagram. Thus, I decided to incorporate its key aspects in my final year project. Making use of SusProg3D to study suspension design and kinematic alignments and taking cue from MATLAB racing lounge, I constructed mathematical models in Simulink. This model also incorporated a feature to calculate variable parameters like acceleration and torque, along with damper inclination, wheelbase, and position of center of gravity, which made it multifunctional. To experiment with ways to collect data of critical parameters of the vehicle and use it to our advantage, my team at BAJA acquired a DI1pro data logger with 4 wheel speed and shock travel sensor, which helped us to identify the shortcomings of the ATV and improve upon them.

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My professional collaboration with Kanan Industries helped me dabble in a corporate setup with tight deadlines and resource planning, where undergoing several assignments made me more equipped with dealings in design of electromechanical systems. By working with thermocouples and PID controllers, I learned the basics of temperature management.

Due to such well-endowed training in the area of mechanical design, vehicle dynamics and control systems, I now want to gain holistic knowledge in the field by obtaining a Master's degree from 'XX' University. My aspiration is to become a competent authority in the areas of control and automation algorithms. I wish to work on the forefront of such emerging technologies, by adapting control theory problems into areas like healthcare and diabetes prevention, which amalgamates the best of crossfunctional worlds.

I firmly believe that 'XX' University, with its multifaced curriculum and strong industry relations, will motivate me to go beyond my latent abilities. I am looking forward to work under Professor 'X' and assist him in his research project on 'Y'. An important motivation behind applying here is 'A' lab, where I want to conduct analysis in domains such as 'C' and 'D'. To satiate its thirst for innovation, the industry expects an amalgamation of both mechanical and computational sciences, which is exhaustively covered under the graduate program. Needless to say, as someone who is aiming to be the best in his field, I am naturally attracted towards the 'XX' University.