STATEMENT OF PURPOSE

I opted for undergraduate program in mechanical engineering because I was interested in mechanisms of machines and processes involved in an industry. This statement of purpose is intended to give a brief idea of my learning in the field of mechanical engineering.

I completed three projects under the guidance of college professors in my undergraduate program. The first was on Development of a Universal Greenness Index for Buildings through Multi-Criteria Decision Making of their Life-Cycle Parameters. Analytical hierarchy process was used to obtain the rating system for the buildings. I used MATLAB as a computational tool to develop a program that gives greenness index.

The second project involved determination of Optimum Residence Time of Slabs in a Reheat Furnace. In this project I used FLUENT as a tool for the combustion and heat transfer analysis. The complete heat transfer was assumed to be via radiation.

My recommender Dr YVD Rao was approached by Walmsleys India Pvt Ltd. They needed a CFD analysis report for deciding the parameters of screw turbines. He then chose and guided me in completion of this task. The performance of screw turbines was analysed based flow parameters which were height, angle of inclination, pitch and outer diameter. I used FLUENT for flow analysis. We were able to derive an empirical relationship between RPM and power produced by the turbine. I had an opportunity to present this work in a national conference.

I interned in an industrial organisation in the last semester. Here I successfully applied data analytics to reduce the specific energy consumption in a vertical rolling mill. As a part of this task, neural networks were used to predict the energy consumption. My knowledge of MATLAB from the first project helped me in the computations. We used global optimisation to get the optimum parameters. Sensitivity analysis was done for energy consumption with respect to all the operating parameters. I came up with a desktop application that uses the feasible extreme values of all the parameters as input to give out the optimum parameters. .

I am interested to do research in the branches HVAC, Refrigeration and Heat Transfer. After going through several works of the professors, I found Prof. James E. Braun’s work on building energy system optimisation exciting. The authors discuss the implementation of distributed optimisation algorithms in multi-agent framework for controllers. I also found the work by Prof. Suresh Garimella on thermocline thermal energy storage to be interesting. Here the effective storage and delivery of heat by thermocline tanks is explained.

In my seventh semester I had an opportunity to be the ‘Teaching Assistant’ for the fluid mechanics course. I learnt about the accuracy and diverse knowledge required to execute this responsibility. It was this time when I developed an interest to pursue a career in the field of academia. I deduced that this program would aid me in pursuing my goal and will also fulfil my passion for research.