Statement of Purpose

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In January of 2010 I traveled on the three person Bob Jones University science team in order to promote my school and teach high-school kids about physics. At each school I taught a basic lesson about inertia with lots of exciting demonstrations to show that physics and engineering is more than abstract ideas that are somehow related to math. My favorite experiment consisted of asking a girl from the audience to change the orientation of the axis of a non-rotating bicycle wheel from pointing upward to pointing parallel to the ground as fast as she possibly could. The ease with which she accomplished this often created speculation of the purpose of asking such an easy task. I would then ask a guy from the audience to do the exact same experiment with the modification that the bicycle wheel would be rotating rapidly. The shock on his face when he attempted to change the orientation quickly and suddenly realized that something about the wheel spinning made the experiment entirely different was priceless. The experiment always captured the students’ attention and interest while providing a spring board for explaining rotational inertia.

Traveling on the science team captures a picture of my firm belief that engineering is useful not as an end of itself, but as a means to help people. On the team I used my knowledge of physics to aid others in their understanding of how the physical world works. Working as a camp counselor for the last two summers also demonstrates my belief that helping people is my objective. Seven to eight campers stayed in my cabin each week and received the focus of my counseling about relational, spiritual, and career issues. Although I could have used my summer to intern with an engineering firm, I believe working as a counselor worth more than the opportunity cost and that I received the greatest blessing by helping campers, creating cabin unity, and working with the other camp staff as a team.

Studying civil engineering best prepares me to use my talent and love for math and science to help people. Because roads, clean water, public buildings, and wise use of land form the back-bone of a successful society, a civil engineering project done well can affect many people for good and therefore it is an ideal branch of engineering for me to choose. Civil engineering has always fascinated me. While in elementary school I built several dams in the ditch in my backyard in order to slow down the speed of water coming down the ditch when it rained which helped prevent soil erosion and caused sediment in the water to fall out. As a high-school senior I checked *Structures: Or Why Things Don't Fall Down* by J.E. Gordon out of a local library and quickly read the book from cover to cover. The book fascinated me because J.E. Gordon masterfully explained structural engineering ideas with simple mathematical models. As an engineering science major in college I enjoyed taking the required class *Statics & Strength of Materials* which focused on structural engineering, and I am pre-registered for next semester to take *Materials Engineering*.

The same comradery that I experienced at camp I also felt when working on a small extracurricular robotics team my freshmen and sophomore years of college. This spirit of comradery gave me an edge to perform my best while implementing solutions for the robot. Although I could not go to Michigan to be at the competition, our robot named “Abel” entered the Intelligent Ground Vehicle Competition (IGVC). My key contributions to the robot were suggesting various solutions that were implemented for several hardware problems and also custom designing a Hough transform algorithm to analyze the picture from the camera and finding the white lines that designated the boundaries of the course. Because my programming background lacked anything in the robot’s source code language of C++ and I had never worked on a program that complex my first challenge was to understand more about programming. I quickly learned enough of C++ to understand how the robot was working and to successfully implement the Hough transformation into the code. Now that I have taken a class in C# programming I understand that the code designs I used on the robot were rather unorthodox and represented terrible style, but the value of teaching myself enough C++ to play a key part and working on a complex project with a team served as a highlight of my college engineering experience .

My work in HVAC also relates to some of my engineering experience. Starting at the end of 2002 I worked in the HVAC department of Bob Jones University during the summer and winter school breaks that I did not work at camp. Working HVAC on a large college campus gave me experiences beyond what a small local HVAC company could provide such as work on control automation on a large scale, cooling towers, boilers, the campus energy conversion plant, but most importantly talking to the technicians about how it all worked. Most of my work consisted of leading a small team of students in accomplishing preventive maintenance tasks. Working HVAC also taught me how the technicians and workers think and view supervisors, administration, and safety rules which often bring discontentment to all. I observed the revolving door that brought many technicians into the HVAC department and then out a few months later because of the many policies they had to follow which were crafted by those that did not understand how the workers thought. This misunderstanding is one of the key reasons I want to study civil engineering with an emphasis in Construction Engineering and Project Management, so I can understand even better both sides of the construction process and eliminate much of the frustration on both sides.

Project management and organizational leadership were the two central responsibilities I fulfilled while serving as vice president of my literary society, Nu Delta Chi, which has over a hundred members. The president of Nu Delta Chi, Joe Lee, and I desired to be very purposeful in every society meeting and action we took instead of being random as is often considered a virtue to some college students. The result of our decision was not only that we created slightly more work for ourselves to organize people and events but also the overall quality of society functions increased. Joe and I split main responsibility of organizing our two biggest events, Nu Delta Chi dating outing and the service project. I took on the service project of helping the Bob Jones University Alumni Association organize a 5K race where all the proceeds from the race went to a scholarship fund. In the end Nu Delta Chi helped with registration, provided food, water, and Gatorade for the 600 runners, served as course marshals to direct runners and disqualify any who cut corners, and helped clean up after the race. Other aspects of serving as vice president include negotiating prices with vendors of society paraphernalia and maintaining good public relations with the school administration on behalf of Nu Delta Chi. Although serving as vice president created more work, I am thankful that I learned so much about organizing people to accomplish as a group something greater than one could do alone.

Enhancing my engineering education by pursuing a master of science in engineering at the University of Texas at Austin is the ideal next step in furthering my ability to help people. CAEE’s emphasis on teaching not only engineering but also the array of other skills that are needed for a successful engineer aligns with my liberal arts undergraduate degree and observations from my personal experience of the need for engineers to be well rounded. CAEE’s commitment to academic excellence and the many research opportunities causes CAEE to stand out from all other schools. Upon completion of a Master of Science degree I would plan to begin working as an engineer in the south-east United States while keeping an open mind toward the possibility of pursuing a PhD.