Statement of Purpose

Dolly Shahani

I, Dolly Shahani, am pursuing my Bachelor of engineering (B.E Hons) in Electrical and Electronics Engineering, at Birla Institute of Technology and Science, Pilani (Hyderabad Campus), India currently in my 3rd year. I am writing this letter in context of my application for summer research fellowship in National Tsing Hua University from 11th May to 13th July 2015.

Opting for Electrical and Electronics engineering has been one of the best decisions I have ever made. Engineering opens up your mind and helps you get dissolved in vast ocean of knowledge. The study of electrical systems and electronics along with medical sciences, physics and mathematics create marvellous wonders. I look forward to be a part of research group in NTHU which is famous for its research and innovations.

I like the idea of implementation of ideas and creating innovations. I am currently engaged in an internship as a research intern at LV Prasad Eye Institute, where I am working on a project in collaboration with the Camera Culture group of MIT Media Lab. I am involved in the development of a non-modular eye design which is designed to track the pupil and detect eye defects using real time processing. I am also engaged in a project which involves tracking of corneal surface using corneal topography technique. The project involves knowledge of programming in c++,opencv and hardware design.

My interest lies in study and research in the field of Biomedical Engineering along with development of new technologies by applying the concepts of image processing, machine learning, discrete mathematics, and computer vision. This stems from my work as a part of my project which involves developing a biomarker of a disease using available clinical phenotypes, with the help of graph theory and machine learning. The work involves application of concepts of pattern recognition and graph theory along with modification in patterns with the help of softwares like Graphical Annotation tool. For several cardiac and neurodegenerative diseases (like Amyotrophic lateral sclerosis, which I am currently working on) the etiology is unknown and no objective diagnostic tool is available today. The use of electronics, signal processing, image processing, machine learning, mathematics and computer programming makes the task more exciting and challengeable.

I have also worked on design of a wireless system which can be used in all emergency situations in a place where human intervention is not possible. The aim of the project was to design a system to monitor temperature of a room and send the data wirelessly to the receiver. As a part of another project, I proved the adherence of Auto Transfer Scheme of Madras Atomic Power Station which was originally designed in 1970s according to the design requirements stated by American National Standard for Polyphase Induction Motors for Power Generating Stations, released in 2000.

I have good expertise in softwares like Matlab, Adobe softwares (like Illustrator, Photoshop), CAD softwares (SolidWorks, Sketchup). I have hands on experience on RasberryPi, Arduino and Beaglebone. I have also done work related to hardwares like DSP tool kit, CCS, EMONA Kit and oscilloscope. I also have an experience in 3D Printing, which I have done during formation of a pupil tracker hardware and an eye modular design used for complete diagnostic of eye, which uses lenses, beam splitter, LEDs, LCD and camera.

I have done courses like Microelectronics circuits, Signals and Systems, Communication Systems, Mathematical Optimization, Digital Design, Control Systems, Microprocessors, Analog and Digital VLSI design, Digital Image

Processing, Digital Signal Processing, Electronics Design, Electrical Machines, Electrical Sciences , Computer Programming and basic Chemistry and Biology.

With a strong desire to research and obtain International exposure in the field of Biomedical engineering, I had applied to Professor Tsai Hung-Yin, National Tsing Hua University, for a Summer Research Project in the field of printing head monitoring for 3D printer. I went through some of his published research papers which resonated with my areas of interest. We defined a mutual topic of interest for the summer research project. This opportunity will provide me with the platform to develop as an International researcher and contribute to the global scientific community. I believe I have the potential to cultivate fruitful results out of this experience. I take pride in being an adaptive learner which would help me incorporate the Taiwan way of research into my existing skill set with ease. I am also pursuing experimental research work which involves formation of hardware design used to solve eye problems.

I hope that you shall consider my research interest, knowledge, performance and my motivation for applying to NTHU Summer Programme Scholarship and be given the opportunity to complete my research internship.

Yours sincerely,
Dolly Shahani
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