ENGINEERING AND ME: WHY I WANT TO BE A COMPUTER ENGINEER

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INTRODUCTION: COMPUTER ENGINEERING IS THE FIELD FOR ME

When I first left home to come to the University of Pittsburgh and study at the Swanson School of Engineering, I was dead set on being a bioengineer. This was almost three months ago, and in the time since I have been exposed to many different presentations as well as a conference relating to the different types of engineering. These have helped me decide which discipline of engineering will best fit my personality and where I would like to go in life. Through research and self-reflection I have settled on computer engineering to be the best fit for me. There are many different reasons I believe that computer engineering is a great fit not only my interest as a student but also the things I find interesting outside of class.

So why does any of that matter? Well, the idea of engineering as a career has encompassed my mind since a young age. Being able to work on technologies and develop new systems, while getting paid seems like something I could only dream of, when truly that is what many engineers get to do! That being said, I believe that Computer Engineering is the career path that will not only allow me to have many different career opportunities, but will at the same time allow my creativity to flow. Computer engineering is the discipline of engineering that will not only make me happy as I continue to work in the field; but will also allow me to live a lifestyle which I aspire to have.

WHO I AM

Computers have been a part of my life for as long as I can remember. Even as a child, computers had a part in my everyday life. During a recent engineering seminar relating to electrical engineering, the presenter described a fictional condition called the "knack". The symptoms of this condition included; tearing apart of electronics and other devices and then rebuilding them, the persistent asking of questions regarding how things work, and the interest in all things technical. If one was to ask my parents if I displayed any of these symptoms as a child they would immediately reply yes. I did each of those things as a child and continue to, with the only difference being that the things taken apart seemingly continue to grow in price.

My Exposure to Engineering

My first real exposure to an engineering career was with a group of bioengineers. I worked for two summers volunteering my time at a local hospital near my home working with the bioengineering technicians who would repair and service the hospital equipment. This was my introduction to a job that would let me do what I thought was fun; the disassembly and repair of electronics. With this experience in mind, I applied to the University of Pittsburgh in hopes of being a bioengineer. However, while I was exposed to new types of engineering and the different things one could do with these different disciplines, I leaned more towards Computer Engineering. To sum up what a computer engineer does, one can look at the description given by the Occupational Outlook Handbook: "Computer hardware engineers research, design, develop, and test computer equipment such as chips, circuit boards, or routers. By solving complex problems in computer hardware, these engineers create rapid advances in computer technology" [1]. Meaning that computer engineers are at the forefront of technological advances, and are the people making the technology of the future.

While still in high school, I was exposed to a little education on software code writing as well as web design. This was the first time I considered this as a career choice, or even a field of study. During 11th and 12th grade, I was able to take different code writing classes which increased my love for computers and the power that they possessed. I enjoyed these classes so much that one of my projects was purchased by a local business and is currently their businesses website [2]. This first experience writing code made me realize that computers could be used for much more than wasting time, but rather can make simple operations much easier and help with workflow. However, it was not until I came to Pitt that I was introduced to computer engineering and the fact that they use these ideas to optimize products and invent new technologies.

Where Can Computer Engineering Take Me?

At the freshman engineering conference I learned from real computer engineers what types of work I could possibly do with my degree. At this conference, two speakers really made me think about how great of a fit computer engineering was for me. The first speaker was Chao Hu who is in charge of hardware development for Compunetix. He had two powerful quotes that made me consider computer engineering, "The products you touch change people's lives" and, "Computer Engineers have lots of hands on work" [3]. Working with my hands is something that I love and with hardware engineering I could work hands on with components. At the same time, the hardware I would be working on would be directly changing the lives of the users.

The second speaker to talk at the conference was Jerry Pompa, another computer engineer who worked for Compunetix. Mr. Pompa talked about how computer

engineers work on different projects, as well as what companies look for when hiring engineers. A notable quote taken from Jerry Pompa from the conference was, "Computer engineers are a vital part of any corporation" [4]. This quote looks at the aspect that a computer engineer can better any corporation, and are often time a part of any companies relating to electronics. Furthermore, this allows for a computer engineer to work in many different tech sector careers; some of these include, medical device manufacturing and development, computer hardware/software companies, and various other tech sector positions.

Where does this leave me?

This allows for myself to be in a great position when looking for a job in the computer engineering field. There is no doubt that computers are everywhere, but they have a strong role in engineering specifically, seen in this quote from the *Fundamentals of Computer-Aided Engineering.* "During the past four decades, computers and computer-based information technologies have penetrated into every aspect of our daily lives and have profoundly changed the way we perform many of our daily activities" [5]. This being said I would be able to work in many different locations and many different work place environments, due to the fact that computers have become a part of every corporation and every home across the world.

One specific example of this would be working for Intel in their Arizona location. Arizona is one of the many different locations I would love to live in and Intel would be a great fit for my degree. While working at Intel in Arizona, I would be exposed to many different settings such as clean rooms and product design labs. One other thing that I would get to do if I worked at Intel would be that of working with people from many other cultures. The products developed at Intel span many different countries, thus bringing many different cultures together. This is yet another reason why computer engineering is a good fit for me. Cultures and how different people's lives are from different countries and settings is something that fascinates me.

Another thing that computer engineering would allow me to do that I love is work with my hands. Hardware engineering would allow me to get a hands on task at constructing new components for computers and systems. Yet again, Intel offers this as well as many other companies in the computer sector. One company that has lots of hands on work is that of Nvidia, a major graphics processor manufacturer. What this means for me is that there are many different opportunities within computer engineering that allow me to do anything I could really imagine. So not only does computer engineering have many different opportunities for myself, it also allows me to do different types of work as well as put me in different settings. This leaves me with the question what in computer engineering will be best for me, and to get a better idea of this I can look at what is currently happening in computer engineering.

WHAT REALLY GOES ON IN COMPUTER ENGINEERING

According to the Occupational Outlook Handbook the media salary from 2010 was ~$98,810 per year. The job growth was around 9% and the expected employment growth from 2010-2020 was 6,300 careers [1]. While this is a stat sheet for the career, it does not truly represent what type of work I can expect to be doing, or what to expect in the work place. To better understand the types of projects computer engineers are currently working on I looked at a peer review journal called *Advances in Electrical and Computer Engineering* [6].

Some of the things I learned from looking at the journal were very appealing to me, and made me believe even more that computer engineering was an appropriate choice for my future. Some of the notable things I got from this research is that computer engineers don't just work in cubicles by themselves. Lots of hands on work occurs in the computer engineering field, as well as lots of group/team work to help ideas flow and combine strengths of the group. Computer engineering needs more than just people that are fluent at writing code, but also requires the hardware components to make that code work. This was a subject that Chao Hu also covered in his presentation at the career conference. A direct quote from his presentation was, "without the support of different types of engineers/resources none of the hardware would work" [3]. This is largely due to the fact that these engineers need to work in unison to bring a product to the marketplace.

An example of how software can shape hardware use/ design, can be seen in an article from the *Advances in Electrical and Computer Engineering* journal. In this article, the modeling of road traffic was discussed and could then be used to change how traffic was directed and handled [7]. This may not necessarily apply directly to "computer hardware" but can change how hardware used on roads works. This also displays the breadth of computer engineering and all of the different applications that can apply to it.

Exploring further into how computer engineering is a fit for me, I also looked into similar career fields. The most obvious similar career is computer science, which is also a program at Pitt. The Encyclopedia Britannica defines computer science as, "The study of computers, including their design (architecture) and their uses for computations, data processing, and systems control. The field of computer science includes engineering activities such as the design of computers and of the hardware and software that make up computer systems" [8]. While this is similar to computer engineering by definition, I feel as though I would be offered better opportunities in my career with a degree in computer engineering. Thus, allowing me to live a life that more suits what I would like to be doing 20 years from now.

How is What Really Goes on in Computer Engineering Relevant to me?

This leaves me in a very interesting situation with my future career of computer engineering. For it is not a problem of me not being able to find a work setting I will like. But having to pick from multiple different settings and deciding which will be best for me. After all of my research I believe that computer engineering will be a great fit for my lifestyle, as well as offering me different opportunities along the way.

With the different types of work I could do as a computer engineer in mind, I believe that hardware engineering would be the best fit for me. This is due to many different aspects of what hardware engineering deals with. Computer hardware engineering will allow for me to work in many different settings and at the same time work with my hands on real products that will reach consumers. Hardware engineering would also allow for me to work in a team with others, as well as work with software engineers to better optimize the hardware to function with the software being developed. With the resources used, I can say with confidence that computer engineering is the correct type of engineering for me to pursue as a career and study at the University of Pittsburgh.

CONCLUSION: YES, COMPUTER ENGINEERING IS RIGHT FOR ME

I feel as though I am still too young to make a concert decision regarding what I truly want to do with a computer engineering degree. However, at the same time this is what attracts me to the field even more. Computer engineering will allow me to live out my life however I wish and will give me opportunities to work with many different disciplines of engineers in different markets. Form personal electronics, to medical devices a computer engineer touches most of the products.

I see myself fitting well in this field because of the variety of work and the variety in what I will be doing from day to day. As a computer engineer, as stated throughout the paper, I will have opportunities to work with others and continue to learn every day as I work. At the same time, there are career opportunities across the country in every state and this means I could truly work/live wherever I fell would be the best for me and my future family. In regards to my feelings about computer engineering, I can honestly say I am excited to explore this field as I continue my education. I look forward to my future career as a computer engineer as it will truly be everything I am looking for in a career.

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ACKNOWLEDGEMENTS

I would like to thank all of the students on my floor for helping with proofreading. I would also like to thank my roommate for his continued help with topic discussion and writing skills.