I spent my first co-op term working for the software team on the Navy Multiband Terminal (NMT) team at Raytheon’s Network Centric Systems site in Marlborough, Massachusetts. NMT is a next-generation satellite communication (SATCOM) system that provides unprecedented connectivity, bandwidth, and protection against enemy intercepts. As a member of the software team, I worked on a number of different projects ranging from testing and coding to documentation.

The assignment that I spent the majority of my time on was the NMT regression test. It was my job to test the NMT software on a daily basis to ensure that nothing broke from build to build. Due to the size and complexity of the NMT software this proved to be a very important task. For the first half of my work term running the regression test took up the majority of my time. This led to my next major project. During my time at Raytheon, I was given the opportunity to receive Six Sigma training and become a Six Sigma specialist. Raytheon has adopted Six Sigma as a philosophy that plays an integral role in improving efficiency and quality throughout the company. For my Six Sigma project I redeveloped the regression test with the goal of making it less time consuming, more automated, and more consistent with the actual terminal operation. In addition, I worked on keyboard navigation for the operator interface. The idea being, that in the event the mouse breaks the operator would still be able to perform all the functions that the software has to offer. Lastly, I did some documentation work where I cleaned up and checked the consistency of an operator interface SDD that will ultimately go out to the
customer. There was no formal training specifically directed at any of the tasks that I was assigned however, in the first week there are several orientation programs. Much of orientation material serves an introduction to Raytheon. I was not assigned a mentor who I addressed all of my questions to. Everybody at the office was very approachable and who I went to for help depended on what I was working on.

My educational background served as an important basis for my work at Raytheon. While a lot of on the job learning was required, I feel that my experiences from school helped me to keep up. My computer science courses proved to be of most use. Going into this co-op with no experience with working on a software team made this an invaluable experience providing me with insight into the industry.

Life outside the co-op was extremely relaxing. Not having homework to worry about was an awesome feeling. Also, it gave me time to participate in a lot more leisure activities. However, the atmosphere is not as exciting as being at school. I lived in an apartment complex located in Marlborough. I lived with two other co-ops from Cornell who worked at Intel which is located nearby. Public transportation in the area was virtually nonexistent and having a car was pretty much required. In my opinion there are plenty of opportunities to get involved in social activities as long as you’re willing to go out and look.

Overall, I would say this experience was a really positive one. I learned a lot on the job and most importantly I feel that this experience will help me to make better decisions on what I would like to do in the future.
I spent my second co-op term working on the same team as my first term. I was again on the software team working on the Navy Multiband Terminal (NMT), a next-generation satellite communication (SATCOM) system, at Raytheon’s Network Centric Systems site in Marlborough, Massachusetts.

In addition, to being on the same team, I was assigned much of the same work as my first term. As a result, I was able to start working right away as I was already familiar with the project and the tasks involved. I was given the responsibility of conducting the daily regression test. Like last time, the majority of my time was spent on this task. The test is executed to ensure that no new errors arise as developers continually make changes to the software. Again, the regression test proved to be an integral part of the development process for the NMT team. When not running the test, I worked on various other projects including some coding, bug fixes, and documentation. I was able to become more familiar with GUI’s and java coding related to GUI’s. I worked on making the screens that make up the Operator Interface Software (OIS) more consistent, fixed memory leak issues in the OIS, and cleaned up the OIS by removing deprecated screens. Also, I worked on documentation issues. At Raytheon, giant documents known as Software Design Documents (SDD’s) must be presented to the customer. Typically, these documents are generated using a tool known as SoDA (Software Documentation Automation). I was given the opportunity to familiarize myself with the tool and I was able to fix a number of document generation issues that showed up while I was there.
These tasks took up the majority of my time and the rest of my time was spent working on smaller tasks such as investigating potential bugs in the software. Because I was on the same team and my work was very similar to last time no formal training was required. If I had a question about a task I would usually direct my questions at the person who assigned the task to me. I was not assigned a “mentor” but I did have a supervisor who was very helpful and approachable any time I needed something.

Unfortunately, I was not able to apply the majority of my educational background to my job as my work consisted entirely of software related tasks. Nonetheless, my computer science classes proved to be very useful and I used my knowledge from those classes on a daily basis. This experience exposed me to many different technologies which helped me decide where I would like to concentrate my studies.

Life outside the job was again a very good experience. This time I found a much more affordable apartment on the main street in Marlborough. The apartment was considered intern housing so short term leases were not a problem. The atmosphere was pretty fun there as the surrounding apartments were also occupied by interns. Public transportation was still mostly nonexistent and a car was still needed to get around. The lack of homework made life a lot less stressful and I really enjoyed my time there.

In the end, I feel that co-op was an invaluable experience. I now have a pretty good idea of what to expect after graduating. This has helped me to reassess my goals and future plans. I learned a lot on my co-op, a lot more than I realized at first, and I would highly recommend it to anyone.
Co-op Work Assignment

At Raytheon, I was working in the electronics center on the Darpa Trust Program. The main goal of our project is to ensure that integrated circuits can be trusted no matter where they are designed or manufactured. Most of the design and fabrication of integrated circuits is being pushed offshore so we need to be able to identify malicious changes that may have been made to our circuits in the design or fabrication stage. My role in the project was to write Perl scripts so that we could have an automated way to generate scripts for optimizing digital circuits. My code would identify gates that produced constants in the circuit and then generate a script that could be used to remove or optimize gates based off of these constants.

I did not have any specific training. I just worked closely with another co-worker who answered all of my questions and helped me with any problems I ran into. I was also assigned a "buddy" for any of my more general questions or concerns.

Assessment of Learning and Development

While working at Raytheon, I definitely relied on my knowledge of digital circuits as well as my programming experience. I learned that I had to be flexible and adapt to changes while writing my script because the people I was working with would constantly change their minds about what they wanted the script to do. I alone was responsible for the script so I had to go and ask others for help when needed or find out how to do what I needed to do. This co-op definitely affected not only my professional development but my personal development as well. It helped improve my networking skills with other workers and co-ops.

Life Out-side of Co-op

It was hard for me to find housing in the El Segundo, CA area. For the most part, I searched for housing on Craigslist, but it was difficult because I was only looking for an apartment for about two months. The biggest problem was that everyone I talked to wanted to meet the person who would be moving in before making a commitment, and I was unable to do that. I eventually found housing in Redondo Beach (about 5 miles from work) with someone from Craigslist who had relatives that went to Cornell.

I drove my car out to California, which Raytheon reimbursed me for. However, there is public transportation available. Traffic near Los Angeles is horrible, and I would recommend looking into public transportation. But it's still nice to have your car there so you can drive to places on the weekends. There are plenty of opportunities for social activities. I lived near Hermosa Beach, which always had things going on at the pier. Santa Monica, Malibu, Hollywood, and downtown LA are also nearby, with many shopping centers and tourist attractions. There's also the Getty, Six Flags: Magic Mountain, Warner Brothers Studios, Universal Studios, beaches, and various cruises that depart from Long
Beach, which are all within 30-45 minutes away. You can also take a scenic drive along the 
pacific coast highway or go camping nearby.

Raytheon has a group for young engineers called YES!net, which arranges a lot of 
activities for interns and recent college graduates. They arranged soccer games on Mondays, 
and beach volleyball games on Tuesdays as well as lots of lunches with guest speakers. 
YES!net members can also participate in the Summer Aerospace games, which is a 
competition between Raytheon, Boeing, Lockheed Martin, and other aerospace companies 
that takes place at a local beach. Each company has teams that compete with each other in 
volleyball, dodgeball, tug of war, and other activities.

Evaluation

At Raytheon, there are a lot of different projects going on so you can work on 
whatever you’d like. The talent acquisition team is always there for you to talk to if you are 
unhappy with the work you are doing. You can start off on one project and switch to 
something completely different, which is really nice. Overall, I think Raytheon is a great 
place to work. You have a lot of options as to what you can work on, and the people there 
really appreciate having interns because you are doing work that is important.