A. Co-op Work Assignment

Mainly, the technical functions of my working group, in relation to the general organization of the company, were to analyze the data on the markets' history and help provide models that simplify and explain the markets' behavior. There were two major projects that I worked on. One was to compare the volatility skews of a couple of option markets. The other was to analyze the daily volatility skew changes of some markets.

The training was mainly provided in readings and in asking my supervisor questions. Also, although it was a minor part of my work, I had the chance to learn about the trading itself by being with the traders, while asking them questions, for a couple of weeks.

B. Assessment of Learning and Development

As I am majoring in applied and engineering physics and planning to minor in applied mathematics and business for engineers, my work activity was very closely related to my educational background and career interests. First, the work activity included working with UNIX, PERL, and EXCEL/VBA which are related to computer engineering. Next, the work activity included learning the concepts of futures, options, and bonds and their mathematical backgrounds which are related to finance and math. As someone planning to work in the quantitative financial field and/or get an MBA, working in this trading company helped me with my future-planning.

This work activity helped me develop both professionally and personally. Professionally, I learned to take the responsibility in completing given tasks with as little mistake as possible and as soon as possible. I also learned that following the work ethics and trying to do more than what was assigned helps excel my skills and impression. Personally, I learned that getting along with colleagues was as important as doing well on assignments. An assignment or a project is not done alone but is done by a group or a team, and without the help from others it would be difficult to do well with your work.

C. Life Outside of Co-op

One of the great things about working as a co-op intern at Archeleon is that you are provided housing located very close to the office. In my case, another co-op intern and I shared the company apartment, which was within a five-minute walking distance from the office.

To get around Frankfurt, using the subway would be a good choice. However, if you are not going that far (that is, if the expected distance is within about 5km), then I recommend walking or riding a bike. I found it quite convenient and refreshing to walk around in Frankfurt because of the well-organized and safe traffic system and the relatively clean air. I see many people commute by bike, but considering that each term is only a few months long, I did not purchase a bike.

There are quite a lot of opportunities for social activities. First of all, everyone in Germany
seems to like drinking, so if one likes drinking then he can enjoy hanging around at bars or other drinking places. Also, if one likes to watch soccer games then he can go to the pub to watch some games with others or go to the soccer stadium. Since many Germans are enthusiastic about soccer, it is quite fun to be in the excited crowd. Also, there are many clubs at the downtown, which is very close to where the office is.

Archeilon did not offer opportunities for community service or athletics, but I believe it is our own responsibilities to search for them. During my first term, the only athletics I participated in was going to the fitness center which is located in which the office is also located.

D. Evaluation

One of the best features of this job was that, because the company is rather small-sized, I could see almost everything that went on in the company as well as how the whole system of trading worked in the company. Another one of the best features was that many workers were kind enough to answer to almost all my questions, and thus I could learn many things in a relatively short period of time. Lastly, the working environment was very employee-friendly. For instance, breakfast was provided every morning, the kitchen had beverages and utensils ready, there was basically no dress code, and many more.

Frankly, there were not any features of this job that I could consider as the worst because of the following reasons. First, in every thing or being that I see, I tend to be able to look at the good features only. Second, there really was nothing unsatisfactory with this job.
Mi Tang
mt438
ORIE
Archelon LLC
Fall 2009, Term 1

Job Summary

My first Co-op term in Archelon is from the Aug. 30th to the Dec. 11th in Frankfurt, Germany. I worked with Mr. Felix Guthoff, the financial engineer of the company, on research projects and provide assistance to the traders. Trainings were provided in the first two weeks. I read the book "Options, Futures, and Other Derivatives" by John C. Hull to learn the basic concepts of options and futures. Mr. Guthoff helped me perform some Excel tasks involved with topics such as trading strategies and the Black-Scholes formula for better understanding. I had two major projects. The first project is a study of the relationships between the implied volatility level and other variables, such as the underlying future price and the time to maturity. I wrote a Perl script to generate useful data and analyzed the relationships between the variables using Excel. I did a PowerPoint presentation in the end to show the results I had found. My second project is related to the basket trading group. I was asked to write a program to find the percentage of undesirable trades in different indices and then figure out possible explanations. During the first term, I also seated with the basket traders and the options traders for two weeks to learn the strategies and tools they use in trading. Mr. Felix Guthoff is my supervisor. I usually asked him for questions about my research projects. The programmers also helped me to find answers to questions related to programming.
I am majoring ORIE and planning to study financial engineering in graduate school. Working with a financial engineer, I gained insights about the use of financial engineering in a trading firm and learned what knowledge and skills a financial engineer should possess. I am sure this valuable working experience would later help me make decisions regarding to my education and career. The educations I had at Cornell definitely helped me working in Archelon. My research projects were deeply involved with statistics and programming. I took some relevant courses at Cornell, so it helped me better understand my task and sometimes to figure out ways to solve problems with knowledge I had already learned. The academic experience I had also made me feel comfortable to learn new things and free to approach people for questions when needed. This is my first time to work in a financial firm. I learned how to make myself fit in a business working environment, such as to adjust to a working lifestyle, to take responsibilities for my own tasks, and to communicate with other staff members. The experience also gave me a more professional understanding of the financial industry. Talking to people in the companies, I was able to learn news and perspectives about the financial world.

Frankfurt is an international city, so I was able to survive here without knowing German. I lived in the apartment provided by Archelon with another co-op student. The apartment has almost everything necessary for living, including two bedrooms, one kitchen, one living room and a bathroom. The apartment is near the company, about a five-minute walking distance. It is also very close to the center of the City, so walking was enough for me to get to the main shopping street, the Zeil, and the skyscrapers of different banks. It is also convenient to take the trains (u-bahn and s-bahn) to get to other parts of the city. To travel within Germany, train is also a good choice. I took the inter city express to visit Munich and Berlin. Since Frankfurt is a modern city, it is full of different social events. Soccer is the most popular sport in Germany. The
German league games are played weekly in the stadium and it is easy to find people play soccer in the parks. The city also holds major public events, such as the international book fair and the marathon. The main shopping street is always full of people and there are many bars open at night. In addition, I attended the company's Christmas party and had several dinners with the employer Mr. Charles Tall and other staffs.

One of the best features of this co-op for me was to live in Germany. It provided a great opportunity to learn the German culture and travel around Europe. In addition, I was able to have a real experience to work in an office environment and get a general understanding of the financial industry.
Mi Tang
mt438
ORIE
Archelon LLC
Summer 2010 Term 2

Job Summary

In my second term of my co-op at Archelon LLC – a proprietary option trading firm in Frankfurt, Germany – I stayed in the financial engineering division with my supervisor and mentor Mr. Felix Guthoff. During the twelve weeks of this term, I worked mostly on the firm’s newly created option trading simulator and provide analysis based on the study.

I started with some preparations about the concepts related to option trading, such as the binomial trees model, black-scholes model, self-financing portfolios, assets' payoff functions, and etc. With the help from Mr. Guthoff and John Hull’s Options, Futures, and Other Derivatives, I was able to absorb these basics quickly. Then Mr. Guthoff asked me to learn the functionalities of the option trading simulation program and used the knowledge I obtained previously to check the accuracies of the program’s important calculations.

After the trading period, I began working on the major project based on the simulator with another co-op student. The task is to run the simulator with four hedging strategies with different combinations of asset types, trading periods, and stock symbols and then compare the performances of these strategies. By writing my own computer scripts and rating the strategies, I tried to find the best strategy for a number of categories and time periods. I also used excel and made graphs to help the analysis. After that, I incorporated the data and graphs into a PowerPoint presentation. The research took about two months. In the end, my partner and I presented our
studies in front of the firm's professionals during the internet conference. The presentation was well received.

For the last two weeks of my term, I wrote computer scripts to run the simulator while wisely switching positions based on the relationship between the market’s realized volatility and implied volatility. I tried to find the best strategy which resulted in the highest profit for different categories of the stocks. I organized the graph and data in the excel sheets and presented them to the professional trader.

Looking back at the entire experiences at Archelon, this co-op is very educational for me. I have been planning to study Financial Engineering at a graduate school, so working directly within the FE division provided me practical learning opportunities. I was able to understand the roles and responsibilities for a financial engineer in a trading firm. I had the chance to see how trading were taken place electronically, to get to know the well-known Black-Scholes model, and to write computer scripts by myself for trading and analytical purposes. Because a lack of related coursework, I was not able to get too deep in option trading. This made me more determined about my plans for a master of FE, since I wanted to learn more advanced mathematical and financial knowledge in order to understand the various aspects about trading more thoroughly.

Frankfurt is one of the largest cities in Germany and the financial center. English is widely spoken, so communication here is not a problem most of the times. Public transportations here are very convenient. Buses, trains, and trams are connecting every part of the city. I live in the firm’s cooperative apartments in the city center for free. This made the life here much easier. A walk to the firm is about five minutes and I can get to almost every part of the city on foot. The owner of the firm, Mr. Charles Tall is also very nice. He invited me and other new full-timers to
the Korean barbecue several times. The environment of the firm is quite relaxing. I thought there would be a heavy pressure in a trading firm before I came here, but this did not happen. People here are nice, approachable for help, and quite humorous sometimes. Another reason why I like this co-op is I have never come to Europe. Traveling is very convenient in Europe. Although I did not travel that much, I have been to Berlin, Munich, Köln, Hockenheim for the F1 racing, Paris, and Amsterdam. Besides, if you love soccer, you would love Europe. There's no better place to watch soccer than Europe.
Job Summary for Co-op Second Term

I did the second term of my co-op at Archelon LLC in Frankfurt, Germany with my friend Mi Tang. Our working group, with Felix, our supervisor, for this term was to act as financial engineers to provide the traders the information they needed to do more efficient and profitable trading. To be more specific, we used the historical data on various options and stocks to find out which hedging strategy was most profitable for each portfolio of options, stocks, and indices. The training was done almost as same as in the first term; during the first week, we were given some books on the fundamentals and mathematics needed to understand the options pricing and trading strategies. After that, we first worked on the simulation program to gather the data and data-mine what we needed to analyze and organize them. And then finally, we analyzed them on which strategies were the most profitable on which portfolio types, etc. Whenever we had questions or results, we would inform Felix and he would give us suggestions or would look at our work and comment on it. However, almost everyone at the company were available for us to ask questions and get help on both our work and anything related to Germany, football, economy, finance, etc.

Doing co-op at Archelon LLC helped me decide on what I would do after graduating. As an A&EP major, I have two general options – to go to graduate school and lead a research life or to get a job in the industries. Although I have not yet decided for sure, I am now more leaning toward getting a job in the financial industries, whether it be trading, banking, or other fields. I had a chance to convince myself that working is certainly fun and rewarding and more fit for me than continuing in the academic world.

During this co-op, I did not do any traveling other than going to a near-by city called Darmstadt to take an exam because I needed to save some money for personal reasons. However, the weather in Germany, and elsewhere in Europe, is truly fantastic – sunny, windy, dry, and cloudless – so is perfect for traveling during weekends. Some places you could go without much worry would be other cities in Germany, Paris, Amsterdam, Switzerland, Hungary, Austria, Poland, Northern Italy, etc. If I had a chance in working in Germany during summer, I would definitely try them all.

Archelon LLC provides housing for interns (either hotel rooms or the company apartment) so there is no need for finding places to stay. Mi and I stayed at the company
apartment and it was really great. It is pretty big, with a fairly large living room, one bathroom, one kitchen, and two big single rooms. Also, it is only 5-minutes walk away from the office, so there really is no need to rush in the morning.

The best features of this job was that I could try something that I needed to find out whether it was something I wanted to do in the future and that I could work with friendly and smart people with all sorts of know-hows. Also, Charlie, the founder, took care of us very well so that I could spend the second term again without having any uncomfortable feelings.