Co-op Work Assignment

At Intel, I worked at the Massachusetts Microprocessor Design Center (MMDC) in Hudson, MA. My team was part of the uncore design for a next-generation enterprise server Itanium chip. I was part of the Tbox/DFX architecture design team, which (along with the implementation and validation teams) works on building the chip's testing architecture.

While working for Intel, I had a variety of tasks: writing and updating the RTL code, debugging validation test case failures by analyzing waveforms, resolving functional bugs, constructing timing diagrams, writing PERL scripts, and updating documentation. One of my major projects was designing, implementing, and maintaining several dozen SystemVerilog assertions, which are snippets of RTL code that enforce key design aspects of the model. Often these would cause test cases to fail, so understanding and resolving these failures, and working with members across different teams was a big part of my job.

Training was provided via orientation on the first day and online courses (for general Intel material). For job related matter, training was provided through 1:1 sessions with team members and experience. My mentor’s approach to my learning was mostly learn-as-you-go, supplemented by 1:1 whiteboard sessions where he would go over key concepts and I could ask questions. I felt very comfortable going to my mentor with any questions I had in general. There was also a ton of internal documentation, but my mentor thought it would be more useful to gain experience rather than spending hours reading the documentation and specifications. Intel also requires every co-op to have a Training Plan, where you and your mentor set goals to learn about subjects inside and outside your job-related functions. Every co-op is also required to hold a 30 minute presentation at the end of his term, where he discusses something he worked on during the term and field some technical questions, so you can sit in on those to learn about what other co-ops are doing.

Learning and Development

The work I was doing on co-op very closely corresponded to the computer engineering related courses I took at Cornell. As of the courses I have currently taken, it was most closely related to Digital Logic Design (ECE 230) and Computer Organization (ECE 3140 / CS 3420), in which we did work designing a simple processor (writing Verilog, synthesizing it, simulating, analyzing waveforms, etc). At Intel, the scope of the project is obviously much, much greater, but I felt very comfortable jumping right into it based on my educational background. Obviously there were a lot of proprietary tools to learn and environments to navigate, so there was a bit of a
threshold to overcome before becoming acclimated. This was the case for me, starting on the architecture team, but from what I hear most co-ops start in implementation or validation, where a few co-ops have told me their work was not really like any course they had taken before.

I felt this experience in a professional engineering setting was incredibly valuable to understanding what a career in this field would be like. While I am still a bit on the fence with what exactly I want to do after graduation, getting a sample of “real” work, in stark contrast to school work, was very enlightening. I think I will go back to campus with a better perspective on my education, a fresh outlook on college life, and hopefully somewhat clarified career goals.

**Life Outside of Co-op**

I contacted a few places for housing in the area, but I found that Andrea Bibi of BB Realty is probably the best option, as she is very used to working with co-ops/interns (especially with Intel), and has some property she rents out exclusively to us. Her apartments are very local (in Marlborough, I was less than 3 miles from work), but you need a car for transportation, unless you are biking to work or something similar. There are a few co-ops here who live as far away as Boston, but I cannot imagine commuting that far daily. I ended up living in a studio apartment by myself, mostly because the building where the co-ops/interns lived was essentially empty (Intel went through a hiring freeze around the time I got my offer, so there were not many co-ops floating around while I was working there). The fact that there were so few interns/co-ops there at the time (from ~40+ in previous years to ~6 while I was there) obviously made making friends and socializing much more difficult.

The towns of Marlborough (where I lived) and Hudson (where Intel is located) do not offer much socially, save for a few local bars/pubs. Boston is about ~30-40 minutes away by car, and there is plenty to do there. I found it very difficult to have much of a social life at all, especially at first, with such few numbers. I joined up with the RCGnet softball team two weeks in (Recent College Graduates network + interns/co-ops), and participated in a few of their activities. This was one of the best decisions I made, as I met ‘07 and ‘08 Cornell grads who were now working there full-time as well as a few of the other co-ops. Since the numbers were so low, there were no Intel-sponsored co-op events as there were in the past, so RCG was the next best thing.

Intel is big on community service, with most fundraisers benefitting the United Way. I participated in some of the events, including an employee poker tournament and a Wii tennis tournament. They also have emphasis on good health and diversity.

**Evaluation**

My overall experience working here was very good. Intel has a lot of things going for its co-op program, and it seems to be a great place to work. The pay is very good, the hours are
Co-op Job Summary – Intel Corporation

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Co-op Work Assignment

At Intel, I worked at the Massachusetts Microprocessor Design Center (MMDC) in Hudson, MA. My team was part of the uncore design for a next-generation Xeon server chip. I was part of the Cbo architecture/logic design team, which handles connecting the core and LLC to the rest of the uncore. This team works closely with the validation and implementation teams to produce a design which can be used by other groups to actually layout and manufacture a chip.

While working at Intel this summer, I was working mostly independently on a single task. This task involved writing Perl code which would hook into the simulation tools and produce a report showing which parts of the model were non-deterministic after reset. Using the results of my script, I would modify the RTL to “fix” these areas and re-run the assessment. To accomplish this, I had to work well with other members in my group and even outside of my project (leveraging knowledge from other teams). I worked very independently and often had to solve complex problems myself and explore possible solutions.

Training was provided via New Employee Orientation (NEO) on the first day, as well as online courses (for general Intel policies and material). For job related training, this was provided mostly with 1-on-1 sessions with my mentor and team members. There was also a lot of internal documentation that I had to explore. Intel also requires every co-op to have a Training Plan, where you and your mentor set goals to learn about subjects inside and outside of your job-related functions. This training usually involved getting a group of co-ops together and setting up a 1-hr session with someone from a team to talk about some topic. Every co-op is also required to hold a 30-minute technical presentation describing what you worked on at the end of your term, so sitting in on these presentations was also useful to find out what other interns in the building were doing.

Learning and Development

The works I was doing on co-op very closely corresponded to the computer engineering related courses I took at Cornell, such as Intro to Digital Logic Design (ECE 2300) and Computer Organization (ECE 3140 / CS 3420). Most of the skills and topics discussed in these courses were essential to the job I was doing, including writing Verilog, simulating a test case, analyzing waveforms, etc. At Intel, the scope of the project is obviously much greater than the simple processor designed in those classes, but I felt very comfortable jumping right into the job I was doing based on my educational background. This was the case for me, since I was on the architecture / logic design team, but I have heard that many co-ops are placed on implementation or validation or tools teams, where the required skill set is different.

I felt this experience in a professional engineering setting was incredibly valuable to understanding what a career in this field would be like. While I still have not completely clarified my career goals, or decided
what I want to do after graduation, the experience was very enlightening and I highly recommend it to all engineering students. Now that I am back for my senior year, I hope I will be able to make more informed decisions about my educational experience and plans for after graduation.

Life Outside of Co-op

I contacted Andrea Bibi of BB Realty for my second term (same as first term), but I lived in a different building than my first term. This time, I lived in a building which is intended primarily to house interns/co-ops working for local companies including Intel, Bose, etc. Her apartments are very local, only a few miles away from the site. You must have either a car or a bike, or carpool with someone nearby. A few people live further away, some as far as Boston, but that seems a bit long for a daily commute. I lived in a 3-bedroom apartment on Main St in Marlborough, which was great because I shared it with two other Cornell students working at Intel. There were also several other Intel interns in the building. We became good friends and hung out all the time. This is in stark contrast with my first term, where I lived in a studio apartment (there were very few interns at Intel during the fall), and I was mostly alone after work. I enjoyed the social environment living with the interns, and it was a lot more fun (seemed more like college).

There is not much to do in Marlborough or nearby Hudson, except for a few restaurants, bars/pubs, and a mall. Boston is about 30 40 minutes by car, and is quite fun to go to on the weekend. There were also some cool recent college grads working there, and we were able to organize some stuff after work with them and other interns, such as weekly soccer and poker games. All in all, it was much more fun working in the summer, and there was always plenty to do and people around.

Intel is big on community service, and it is easy to get involved with some of their activities and fundraisers. Their main benefactor is the United Way. Some examples of events they have held during my time working there include an employee poker tournament, a Wii tennis tournament, a 5k run/walk, and several cleanup or building houses type of outings.

Evaluation

My overall experience working at Intel as very good. My second term was even better than my first. Intel’s co-op program is very well-organized, and they have good goals set and reasonable expectations of their co-ops. They give you real work and a real experience of what it would be like to work for them starting out of college. The pay is very good, the hours are flexible, the atmosphere is very relaxed, there are some very nice benefits, and there were lots of fun events. My mentor, manager, and supervisor were all great.

Additional Info

- Bonuses, paid vacation, holidays, and other nice benefits
- The site is open 24/7 because of the production facility
- You get a laptop and can log in from home if necessary (e.g. if you are sick)
- There is a cafeteria open from 8 AM – 2 PM (as well as a night shift) which serves decent breakfast and lunch food for pretty cheap; free drinks (coffee, tea, fountain soda) and free fruit; free massage chairs in cafeteria area; also lots of places to eat nearby
- Break room with Wii, ping pong, foosball tables; on-site gym, various athletic courts, and softball field