Job Summary

This summer I worked as an intern in engine control systems on the Tier 4 engine development program. I was put onto a number of projects to assist in calibration of the engine control system for the next generation locomotive engine. Most of my work dealt with empirical models of engine emissions, which allows the locomotive to meet strict emissions standards. I did some theoretical derivation of engine operating parameters but a lot of data crunching. Another one of my projects dealt with calibration of an engine sensor for which I helped plan testing, analyze data and finally make a correction to the sensor output.

GE’s engineering business is full of opportunities to learn. There were multiple lectures and classes put on for interns to learn about the business, the products, engine/locomotive technology and more. I also had the opportunity to see locomotive testing and a some of the production process. Overall I greatly enjoyed working here in a more relevant position than last fall.

I think this internship reaffirmed that I want to pursue engine development in my career. I don’t think that I would want to continue doing large diesel engines, but I would definitely be interested in doing automotive. I found some of what I learned here to be relevant to my work on the FSAE project team. And I honestly think that the car team is as close to a real engineering job as you can get at the university. One thing that I’ve observed throughout my time in the engineering part of GE is that there isn’t a whole lot of “loyalty” necessarily to the company. Many of the engineers I’ve met have come from other businesses who they praise highly still. They seem to move around a lot but what bonds them all together, generally, is a mutual love of technology, no matter where they are.

I think I could have worked a little harder or learned a little more through my assignment. I came into this internship with a good understanding of engines. I learned a lot about diesel engines which I’m not sure is pertinent to my future employment. I had a full plate of tasks for my summer and I worked diligently on them most days. But there were always days where I was stuck in limbo from one task to another that I didn’t really pursue to their fullest. I feel like I could have learned more or found more tasks to work on. This is my only real regret for the summer is that I don’t think I was 100% into my job all of the time, despite the fact that I thoroughly enjoyed what I did.

GE provides housing to their summer interns, but only for 10 weeks. They will provide you with a stipend for the other two weeks, but you end up having an awkward week or two looking for a place to crash or living in a little dorm room at Mercyhurst college. For the first 10 weeks, GE houses us in the town houses at Mercyhurst. On the average, they are okay, but there was a large range of quality. I had a friend who had a newly renovated apartment which looked great and had a nice kitchen. I, however, lived in a second floor apartment which hadn’t been renovated since at least the 90’s. The bedrooms and livingroom were fine but my main complaint was the kitchen that was the size of a closet with no counter space and a compact stove/oven. Both my roommate and I love to cook and this literally frustrated us every day.
Outside of work, GE has opportunities to do community service and intern events almost every day. There was a softball league, beach volleyball league, relay for life, and a plethora of other community service opportunities from cleaning up highways to quilting blankets for babies. With something on the order of 200 interns in Erie, there was always something going on; Almost too much going on. I had a hard time finding time to take care of other responsibilities that I have outside of Erie. That said, it was a lot of fun hanging out with the guys and girls I worked with and I made a lot of friends (or at least acquaintances). Erie is a fairly mediocre city, but there are things to do. The food and bars are cheap (really cheap). Presque Isle beach is like an oasis and is hands-down the best thing about Erie. Otherwise we spent time at the townhouses, hanging out in moderately sized groups, getting to know people from around the country.

To summarize, my favorite part of my summer was obviously spending time with interns, specifically on Presque Isle. I liked my job because I was doing real engineering work. I could have done more hands on work, and I would have liked to learn more (difficult when I came in knowing so much about engines) but I do not by any means regret my summer. Housing could have been better, but it was definitely nice living within a quarter mile of 100+ other interns. All in all, GE is a solid internship experience. On top of it all, they have a fantastic leadership program for engineers called Edison which is a 2 year program during which you work and go to classes at GE. It is somewhat difficult to get into but if you are a hard working cornelian that is passionate about technology, you should have little problem.
A. Co-op Work assignment

During my Summer 2013 Co-op at GE Transportation, I worked as an intern in the Engine Performance team and my assignment leader was Nathan Yeager. The role of the Engine performance team is to provide support for engine operation and performance of a specific locomotive proposal or requisitions. In general, half of the work we do is to control what goes into the cylinder, and the second half is controlling the in-cylinder combustion process itself.

This position gave me great exposure to engines. During the summer, I had a few main projects. One of which was creating an analytical model for an engine family. Using test data, I created transfer functions to predict fuel consumptions and emission levels based on the operating point of the engine. Another project I worked on was supporting engine lab testing. I spent a lot of time in the test cell. I collected test data, analyzed for emissions, and created reports to present to Principal engineers. This project also gave me the opportunity to troubleshoot engine and facility issues, allowing me to get hands on experience in the test cell. During the end of the summer, I was given the opportunity to perform on locomotive testing, recording peak cylinder pressure data, and analyzing the loads on the pistons to ensure it was within stress limits.

At the beginning of the internship, I knew very little about engines. The learning opportunities were tremendous. Initially, I used informational slides and Internal Combustion Engines by Heywood as references. During the summer, we had visiting lecturers that came to talk about Biodiesel, Turbomachinery, and Diesel Engine technology.

B. Assessment of Learning and Development

Returning students at GE Transportation are given the opportunity to preference positions. I selected technical roles, and was given my first choice. This role was much more technically challenging than my previous role in manufacturing. In my job, I used what I learned from Thermodynamics, Heat Transfer, and Automotive engineering. As cheesy as it may sound, being able to see the components of the engine (turbine, compressor, power assembly, etc.) really brought the things I learned in class to life. It was also eye opening to see the level of development and support needed to create a commercially viable engine. The engine performance team is just one subset of a larger team, working together with Engine controls, fuel systems, turbo machinery, engine reliability, and other teams that work to develop the product. The number of unique and challenging opportunities in engine engineering make me excited to work in the industry full time.

This summer I was also exposed to the importance of statistics in engineering, quality, and customer satisfaction. GE heavily relies on six sigma principles for engineering, so statistics is used in the office daily.

C. Life Outside co-op

Erie is a great place to spend a summer. For housing, GE Transportation houses all interns at Mercyhurst University, which is a 15 minute drive to work. The apartments have 2 bedrooms, living room and kitchen. A car is a good thing to have, but not a necessity in the summer since plenty people carpool. In the summer there were about 180 interns working in Erie, so there were a lot of social events planned by the interns. Main highlights of Erie in the summer are Presque Isle State Park (beach, great sunsets, great for running/biking), Waldameer (amusement park, free admission), and Downtown (plenty of bars and