I have always had a passion for aviation and robotics. It fascinated me that huge machines could be controlled to perform extremely precise jobs. In my second year of aerospace engineering I realized that I wanted to learn more about robotics and manufacturing. I started looking for a job to gain hands-on work experience. Close friends of my family in Seattle advised me to approach Electroimpact. Not being familiar with the company, I opened their website and my eye fell on a number of pictures showing a great variety of machines for aircraft manufacturing. While reading I noticed another interesting aspect; engineers are responsible for building and testing their products. Being able to follow a project from the initial planning to the final product was something I found quite unique. With much enthusiasm I sent my resume and cover letter and shortly afterwards a Skype interview followed. When they let me know that they were happy to have me as an intern it seemed too good to be true. However, a lot of paperwork still had to be filled in order to get a Visa. Electroimpact was very helpful and the application process was soon completed. As the last exam period was about to finish I packed my bags and prepared for the flight to Seattle.

**ELECTROIMPACT**

Electroimpact is a highly experienced provider of factory automation and tooling solutions. The company started its life primarily as a supplier of machine tools to Boeing. But over the years Electroimpact has gradually expanded its business overseas to act as a supplier for other major aerospace companies such as Airbus, Spirit Aerosystems, the Japanese heavy industries companies MHI, KHI, FHI, as well as Bombardier and Embraer. The company is situated in Mukilteo near Seattle and close to the Boeing Everett factory. The campus includes two very large high-bay construction and buyoff facilities featuring cranes with up to 32 metric ton lifting capacity, as well as several smaller buildings. As mentioned before, a unique characteristic is that engineers are responsible for both design and development, following projects from the initial planning to the final product. The engineer that designs the tool or machine is also responsible for detailed drawings, coordinating manufacturing, assembly, and any tooling setting or machine alignment. This minimizes the disconnection that happens at a typical company between an engineer, drafter, manufacturer and assembler.

**MY EXPERIENCE AT EI**

Each summer Electroimpact hires around 30 young interns. The interns are divided into groups according to their study program namely mechanical, electrical and IT engineering. As an intern I had a great time working at the company. I was pleasantly surprised to meet so many young students of my own age. The other interns were all American students, mainly from Washington State. They were very keen on showing me the American traditions and every lunch break was a great opportunity to exchange ideas while eating hamburgers and donuts. The senior engineers were very willing to share their knowledge and experience. As all engineers like problem solving, they would always explain how to achieve an even better result. My internship lasted two months from the beginning of July to the end of August.

If we consider the enormous amount of parts that are necessary to build a commercial aircraft, it becomes clear that assembling all parts with great accuracy is a challenge. The development of new tooling solutions and automated equipment for the manufacturing of commercial and military aircraft is therefore of great importance. The increasing use of robots results in faster, safer, less expensive and more precise manufacturing processes.
and my assignment was related to the metrology field. In the first week I learned how to use laser trackers to measure a control network. Once the data from the laser tracker had been collected, I learned how to bundle the data using Spatial Analyzer.

Next I investigated ambient and laser light sensors and DC motors for prototypes of new products. For this task I focused on improving my CAD skills before starting the design of my own parts using Solidworks. To check the mechanical functions I made assemblies and animations. As soon as I completed the Solidworks design, it was time to evaluate the actual product. The parts I had created were produced with 3D printing. It was amazing to see the real parts on my desk a few days after the CAD model had been completed. I mounted the light sensors on the parts to test the complete prototype. To analyze data from the light sensor a control network had to be set up. The network consisted of a CPU, a circuit board to amplify the signal and a computer to see the results. It was a lot of fun to solder wires and calculate the maximum voltage that the sensors could handle. Various power sources had to be attached and trimmed to the right voltage using multimeters. When the computer screen started showing the results it felt like the calculations and the manufacturing work had all been definitely worth it.

This internship gave me the opportunity to learn about the different aspects of being an engineer. I received a broad and varied assignment that contained a good mix of research, design, manufacturing and testing. The American easy going style of jeans and t-shirts and the cooperation between the engineers contributed to a very pleasant working environment.

SEATTLE (CULTURAL AND FREE TIME ACTIVITIES)

For aviation enthusiasts Seattle is the perfect place to be. The city is surrounded by many large and small airfields. Any type of flying is therefore possible. I had the opportunity to fly at the Evergreen Soaring Club in Arlington in a Grob G103. The view from above was absolutely astonishing. On the ground below, the lakes and forests form a beautiful pattern while the snow-covered mountains span the horizon. Furthermore, I had the chance to try formation flying in an aerobatics aircraft. An engineer from Electroimpact built his own RV-8 and offered to show me his skills in making loopings, barrel rolls and chasing the tail maneuvers.

Every summer Seattle offers an incredible air show called Seafair. The C-130 aircraft from the Blue Angels team begins each demonstration showing the maximum performance of the plane. Shortly afterwards the jets appear in their diamond formation. They show the most difficult maneuvers reaching a minimum distance of approximately 45cm apart. If you want to closely inspect the Blue Angels F/A-18 Hornet, the Museum of Flight is something you do not want to miss. The museum has an amazing collection of old, new, civil and military aircraft. The Blackbird and the Blue Angels aircraft were two of my favorite ones.

I was a guest at my family’s friends’ house in the Capitol Hill area close to the center of town. They really made me feel at home and encouraged me to discover Seattle’s social and cultural life.

This internship was an amazing opportunity and a unique experience.

This is a lovely area with nice restaurants, fancy shops and parks. I really loved watching baseball games with them. The Seattle baseball stadium is home to the Mariners. They play nearly every day of the week and during home matches the stadium completely fills up with fans. I was surprised by the interest and passion for sports in Seattle. In addition to baseball, Seattle has a football team and an American football team with good players that keep the reputation of the city high.

The most common shop around town is definitely Starbucks, as Seattle is the city where the company was founded. Small local beer breweries also provide a nice place to relax after a day’s work offering a diverse range of flavors and types. I discovered that the Dutch are not the only ones who love special types of beer since a visit to the brewery after work was common among engineers. After work I would join the other interns for a trip to Mukilteo’s beach or for an evening canoeing on Washington Lake. For a 21st birthday party I had the chance to go to an American fraternity from the University of Washington as some of the interns were members there. Finally, there are also beautiful things outside of Seattle. With my family friends I travelled to Oregon for a weekend visiting the cities of Portland and Ashland. This is a trip worth making as every summer in Ashland there is a high quality Shakespeare festival where they perform old and modern plays that attract a huge crowd.

In retrospect, I can say that this internship was an amazing opportunity and a unique experience.