

# TRAINEE REPORT

2010



45th Annual Issue

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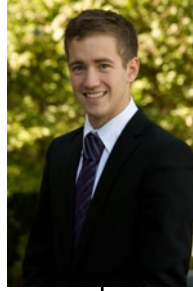
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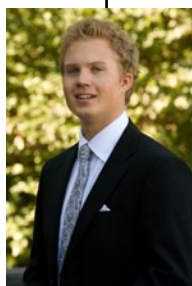
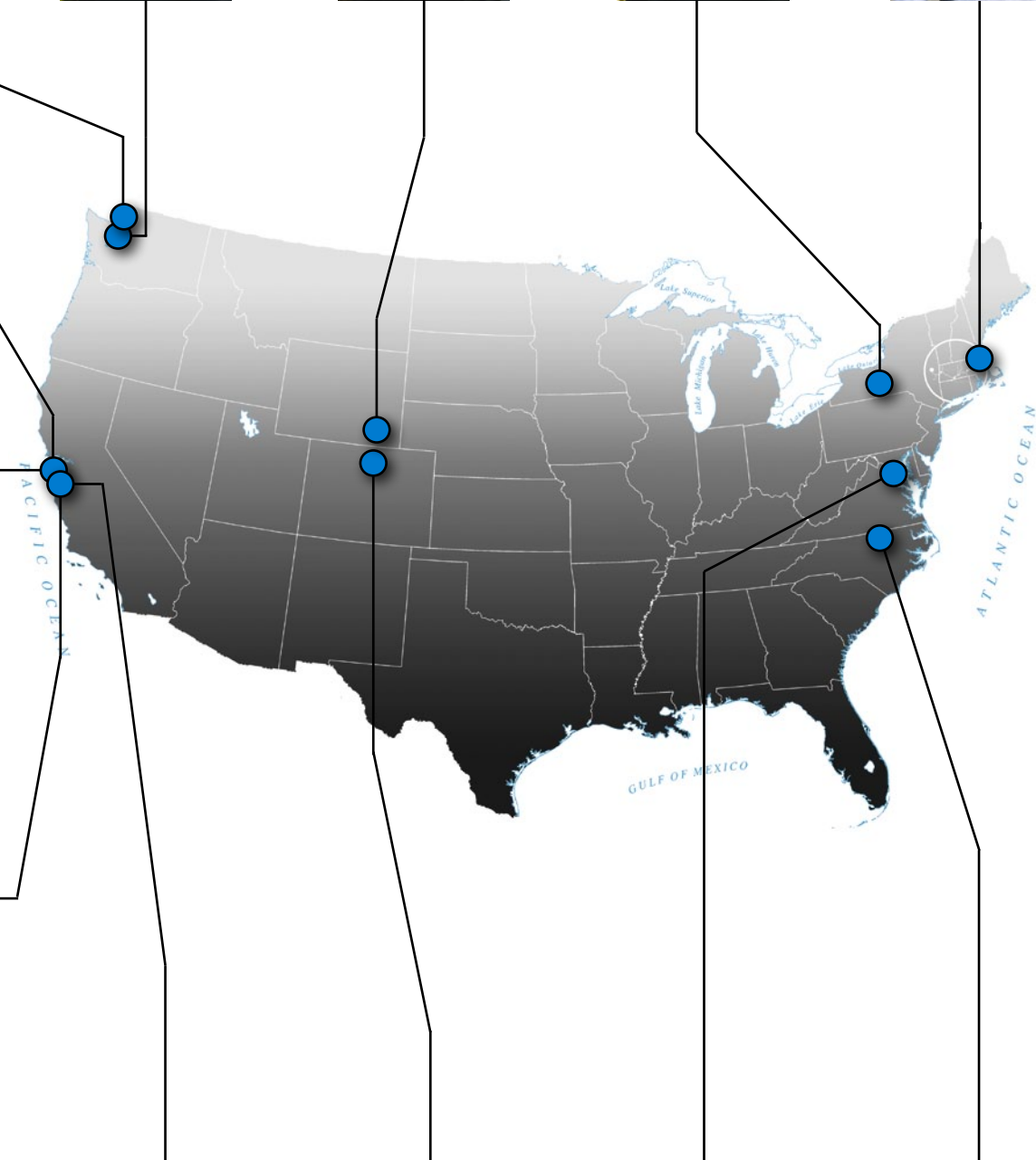
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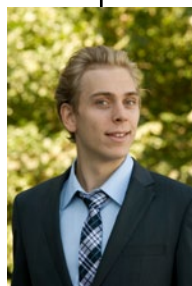
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## CHALMERS ENGINEERING TRAINEE APPOINTMENT COMMITTEE

*Dear reader,*

You hold in your hand the 2010 edition of CETAC'S TRAINEEREPORT. We in CETAC, or Chalmers Engineering Trainee Committee, have worked for over a year to make this magazine what it is today. Along the way we have all gained new insights, made new friends and torn our hair on more than one occasion, but in the end we managed what we had set out to do, and sent 12 brave engineering students to internships in the United States. We have gathered their stories here, and hope that you will find them as inspiring as we have found it to work with this project.

**CETAC is a group** at Chalmers run by students for students. We aim to send as many as possible on internships overseas, and have done so for 44 years now. Our experience and contacts makes this possible, but also the reputation that Sweden and Chalmers enjoy worldwide.

**If you are studying** Computer Science, Electrical Engineering, Engineering Physics, Engineering Mathematics or Software Engineering, do not hesitate to send us an e-mail for more information. The same is true if you represent a company that wants to cooperate with CETAC, either by hosting an intern, or having an ad in the magazine.

**It has been a pleasure** for me to work with CETAC and making this magazine possible, but my work is now over. What happens now is up to you, but I hope I can read about your adventures in a future issue of the CETAC TRAINEEREPORT.

**Enjoy!**

Johan Borglin  
Editor-in-chief



The board of CETAC 2010



The members of CETAC 2010 in August of 2009

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# Att söka CETAC

**Du håller nu en tidning fylld med reseberättelser från chalmerister som har varit i USA sommaren 2010. Läs vad de har upplevt, och ha gärna i åtanke hur det skulle vara att själv flyga över Atlanten, samla värdefull erfarenhet för framtiden och uppleva världens alla kulturer i Nordamerika sommaren 2012!**

CETAC lägger stor vikt vid att praktikplatserna är intressanta och kvalificerade ingenjörsarbeten. Vi kan stoltsera med tidigare arbetsgivare som till exempel Siemens, NASA, Apple, Intel, Microsoft, Silicon Power Corp, Merlin Engineering Works och SUN Microsystems. I regel varar praktiken åtta till tolv veckor, men en del stannar betydligt längre än så!

Praktiken ger inte bara goda arbetslivserfarenheter, utan dessutom ett värdefullt kulturellt utbyte. Kulturell förståelse och erfarenhet är något som efterfrågas allt mer i det ökande globaliserade näringslivet. Språkerfarenheten är också väldigt viktig, då ingenjörers kommunikativa förmåga är av stort värde för företagen idag. Så ligg steget före; sök medlemskap i CETAC och upplev ett spännande och lärorikt äventyr sommaren 2012!

## Medlemskap

För att bli medlem i CETAC skall du studera på D, E, F, TM eller IT, samt vara svensk medborgare eller ha permanent uppehållstillstånd i Norden. Vid ansökningstillfället måste du även ha uppnått minst 75 hp på din utbildning, och under det kommande året uppnå sådana studieresultat att du är studiemedelsberättigad. CETAC är föreningen för dig som är motiverad och beredd att lägga ned tid och engagemang för att få ut något extra av din studietid.

## Att söka styrelsen

CETAC 2011 kommer under läsperiod tre 2011 att söka medlemmar till styrelsen för CETAC 2012. Den nya styrelsen antar sedan ungefär 25 nya medlemmar under läsperiod fyra 2011. Styrelsen består av fem personer. Ordföranden organiserar arbetet, håller kontakten med American-Scandinavian Foundation och hanterar visumansökningarna. Kassören lägger upp en budget, deklarerar och fakturerar företag vid annonsförsäljning. Efter vistelsen i USA skriver alla varsin reseberättelse. Dessa sammanställs sedan i vår tidning, Trainee Report, som du nu håller i din hand. Redaktören har som huvudsaklig uppgift att utforma föregående års rapport men framställer även broschyrer, affischer och andra trycksaker. I styrelsen ingår också två jobbchefer som kontaktar amerikanska företag och finner lämpliga arbetsgivare.

## Att vara medlem i CETAC

Medlemsskapet i CETAC bygger på såväl personliga arbetsinsatser som arbete i grupp mot ett gemensamt mål. För att kunna finansiera resan till USA och andra omkostnader samlar man som medlem in bidrag och säljer ett antal annonsplatser i Trainee Report. Annonsförsäljningen inleds på hösten med en resa till Stockholm. Under denna resa besöks intressanta företag där medlemmarna får presentera både sig själva och CETAC. Föreningen har ett brett kontaktnät med företag, vilket medlemmarna kan utgå ifrån under annonsförsäljningen. Under hösten anordnas även en säljkurs och en CV-kurs för CETAC:s medlemmar. Att vara medlem i CETAC är ett stort engagemang men det ger samtidigt en unik möjlighet till en givande avlönad praktik i USA eller Kanada och många nya vänner och kontakter från Chalmers och Nordamerika. Så ta chansen och sök du också!



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# New York: A Forest of Skyscrapers

Text & photos: Johan Borglin



It had been, literally, the longest day of my life, and I was more than happy with finally being back on the ground again, after a train ride to Copenhagen, followed by the long flight to JFK via Reykjavik and the still-steaming volcano.

I was just about to fall asleep in the seat of the taxi that took me and my fellow CETAC friends toward our hostel when the taxi driver suddenly called "Look to your left" as he did a sharp right-turn off the highway, and suddenly the whole Manhattan skyline lay before us, lighting up the night sky with millions of lights and reflecting in the Hudson River, and suddenly I realized where I was, and that the trip we had been working towards for a year had finally begun.

The trip to New York is, in my opinion, CETAC's best tradition, serving as a chance for everyone to meet up one last time and have some fun before going off to different corners of the continent to work. This year was extra fun, since all members except one could make it, even if some left earlier than others. This meant that we had a large group, with lots of different interests (even if it seemed like everyone was carrying an SLR camera). Since New York is the city it is, with an almost limitless amount of things to do, we simply split up into groups with similar aims for the day. Later, we would meet up again at our hostel, conveniently located by Columbus circle, close to the south end of Central Park, to plan the evening.

The daily activities consisted of a lot of walking, at least for me. We marched up and down the avenues and streets of the never-sleeping city, amazed by the forest of skyscrapers and the sheer amount of people living in such a small area. Since we only had a few days, four in my case, we concentrated on the more touristic parts and stayed on Manhattan for most of the time, even if shorter excursions to the Bronx, New Jersey and Williamsburg were made by some members.

Manhattan seemed, in some strange way, to be big enough for spending several years exploring it, yet small enough to walk across in a few hours, and viewed from the observation deck of the Empire State Building, the whole city looks surprisingly small, at least compared to say Paris which seems to go on forever when viewed from the Eiffel Tower. I think it is this enormous concentration of people, all part of the giant machinery that is a city, which is my strongest memory from my visit.

In addition to the previously mentioned visit to the Empire State Building, which was easily worth the \$20 we paid to take the elevator, we visited southern Manhattan, with Wall Street and the financial district, where we learned the truth about the Boston Tea Party, walked down Broadway, and went jogging in Central Park, among many other "musts" when in NY.

The evenings varied greatly in

character. When I arrived, some of us had already been in the city for a few days and recovered from the jet-lag, allowing them to experience the night life, while we who had just arrived dropped dead in our beds after a quick visit to the local sports bar, wondering if we ever would understand baseball. However, a good nights sleep got us back on our feet and into the local time-zone, and before our short stay was over, we managed to visit random clubs in Essex, a stand-up comedy show and a hidden hamburger joint in Upper Midtown.

The hostel we lived in might not have held the highest standards, but it was relatively cheap and had a great location close to Central Park, Times Square and a subway station, something that becomes very important when your feet are tired after a long day of walking

All in all, the New York trip was a great experience, and I can really recommend anyone flying to the US via one of its many airports to stay for a few days and have a look around.





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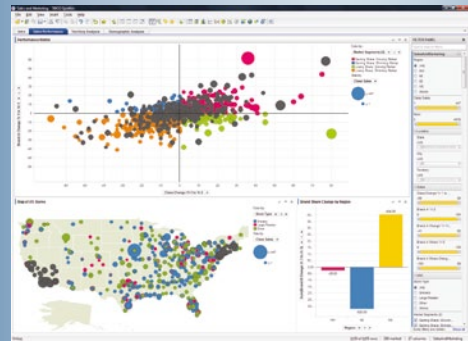
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Text & photos: Stefan Carlsson

## Green (High) Tech in the Bay

**For decades Silicon Valley has kept its place as the world's leading center of everything "tech". Arriving at such a place, knowing you will spend the next six months researching high efficiency solar cells, can only be described as a dream come true.**

JDSU, the company where I would take part in this research, is a leader in laser and photonic technologies and has through rapid expansion entered into new product areas. One such area is high-efficiency, triple-junction solar cells.

This type of solar cell has traditionally only been used within the space and satellite industry, where cost is no object and the highest performance possible a necessity. During the past decade, these cells have seen an incredible improvement, going from the low 30's to past 40 percent efficiencies. This has spurred a growing interest in bringing these cells to the terrestrial market. Doing so at a low cost, in a reliable, high volume fashion is the challenge everyone entering the market is now facing.

To start off my internship at JDSU and bring me some insight into the solar cell industry, I was given the opportunity to

attend a nearby solar conference. Sitting down with the experts and CEO's of leading solar tech firms definitely had the effect of jump-starting my time in the US. As if moving to the other side of the world did not provide enough of a kick.

The conference added to that feeling of being right THERE, in Silicon Valley, where everything happens. With so many tech companies in one place, your closest competitor or most valuable customer is never more than a few miles away.

The second week, right after having found an apartment to rent, it was time to dive into work. Joining the Photovoltaic

Team at JDSU at this point in time proved very rewarding and challenging at the same time. Preparations for the launch of the first solar cell product to reach market were well on their way, and new problems with the production line in Taiwan seemed to pop up all the time. Murphy's Law was ever present.

This constant flow of new problems provided an excellent learning curve for someone new to the game. I had to become familiar with the various equipment used for solar cell research, in order to help out with troubleshooting faulty cells, and more importantly learn how to interpret the results.

When competition is fierce even a small



efficiency advantage can mean the difference between business and no business. In a triple junction solar cell there are many parameters affecting performance and most of the time it is an interaction between so many factors you have to go with a good guess and trial error. An example of this is the design of the anti-reflective coating to be used on a particular solar cell.

Every high efficiency multi-junction cell comes with a specified efficiency in air. Because the materials used in this type of cell are rare and expensive these are at the same time optimized to be used under concentrated light, usually at or above 500 times. Now, that requires using concentrating optics; lenses, mirrors etc. The cell therefore ends up in an environment where instead of air it will be surrounded by glass. As a cell producer you will have to walk the line between good numbers in a spreadsheet that you can present to potential customers and real world performance.

As my main project, along side troubleshooting production problems, I have therefore worked on finding a relationship between results in air and under glass. This has also taken me down the road of writing a small MATLAB program to run simulations, which hopefully will help in improving the AR-coating on JDSU cells in the future.

The education I have received at Chalmers has provided me with confidence that I can quickly learn what is needed to understand a problem and carry the toolset necessary to solve it. For instance, when I was asked if I could

write a program to solve some logistics issues, I answered: "Sure, why not".

Having had just one course in basic JAVA programming, I started off coding in a new language, Python, and did fine. The program was crude in the beginning, but kept improving and is now used by JDSU.

Silicon Valley is a place people come to fulfill their dreams from all over the world. Creating a cultural mixture that is remarkable. No one in my research group at JDSU speaks the same language, except me and my manager! You can walk into an Asian supermarket and it feels like you travelled across the globe.

Now, this means I can have my food the way I like it, (love Thai), as well as perfect Swedish summer weather (25-30 °C and sunny) and do the work I love the most, beat that!

Change is always present here, that is the nature of Silicon Valley. People work hard, in our group at JDSU both American and Taiwan time, but look to the future and see a better place. The GO of the people here can truly sweep you away at times.

When I have not been working I have had some time to experience



### Stefan Carlsson

Age: 22

Company: JDSU

Industry: Optical products and broadband communications.

Location: Milpitas, California

Bachelor: Engineering Physics

Best US experience: Driving down HWY 1 with my girlfriend.

Worst US experience: Dropping car keys in bear-safe garbage can.



the beautiful scenery of this country. From the high peaks and waterfalls of Yosemite National Park in the Sierra Nevada Mountains to the Golden Gate Bridge in San Francisco. Just back from a week of vacation, driving down HWY 1 and the Big Sur with my girlfriend, I am looking forward to another 3 months here in US & A.

To sum things up, this has been a fantastic summer and I like to thank senior manger Jan-Gustav Werthen, who took me in under his command, together with my two supervisors; Xiaodong Chen and James Q. Liu, as well as all my other colleagues and friends at JDSU.





Text & photos: Anders Olofsson

## A Summer in Seattle

**Lush pine forests and fresh air were my first impressions of Washington state, which together with the beautiful lakes made things almost feel like Sweden. Ignoring the general lack of sleep (and the three hour jetlag from the east coast) I made my way to the city that would be my home for the rest of the year.**

My second impression was the chilly weather which was a huge difference from the massive heat of Manhattan. Would the whole summer be like this? Things eventually changed however: Summer in Seattle does apparently not start until July, where two months of excellent weather usually follow. And after my almost three months here I have to concur. Summer here is indeed really nice.

Previous CETAC member Jakob had generously offered me to stay a few days at his and his roommates' house, which was very helpful as this allowed me to focus on the huge amounts of paperwork required prior to start as well as finding a more permanent place to stay. A bit confused in the beginning, things eventually

worked out as I found a room in a shared household to stay in.

Traditionally Seattle has always had a very artistic and creative touch, which really adds to the feel of the city. When walking through town, it is not uncommon to run into open art installations and the like. Nature is always close and the surrounding area offers plenty of outdoor recreations while the city itself has everything a metropolitan city is expected to. "Kayak by day and then go to the opera at night" as the state's tourism office likes to put it. Nightlife is exciting, much due to the many and interesting bars of Capitol Hill and Belltown, and the frequent concert events and music festivals make sure there is always something going on. Seattle is fun!

Originally an independent company called Insightful, the Seattle office of TIBCO Software develops and maintains the statistical programming language S-PLUS along with tools and software. My position as a Quality Assurance (QA) Engineer has mainly revolved around manual testing of the products being developed at the company. This includes analyzing requirements in order to be able to set up suitable test cases which accurately test the new features being developed. There is rarely enough time to test all possible usage scenarios on

all different platform combinations, so intuitive comparison and prioritizing becomes an important skill set.

Since the art of testing can be translated to "make it fail", there is a lot of creativity involved. Bugs and defects can be found in the most unexpected places which forces you to think outside the normal usage scenarios. When finding a defect, you start to break it down into the least possible steps required to reproduce it, which helps the developer identify where the program fails. Communication is critical and it is important to be as specific and clear as possible.

Team spirit is high, with frequent morale boosting activities such as boat trips and office get-togethers as well as the (now) traditional intern jump into Lake Union. Colleagues are competent, nice and helpful and the staff includes some of the brightest people I have met.

One thing that I value really high is to live with roommates. This particular house currently houses eight people and is a happy mix of students and worker bees trying to make it. Day trips and other events make sure time passes by quickly – important tasks (such as writing this article) have often been put on hold in favor of the many other exciting things going on. I have yet to popularize my



Busy sunday at Pike Place Market

trademark dish "Swedish meatballs with noodles", but blame the failure on the lack of proper meatball brands. It has really been a fantastic summer, and I really do not want things to end. In the time of writing I have another 4 months ahead of me and while the rainy fall will soon make itself known I am actually looking forward to it.

CETAC had a wonderful week in New York which for me was my second visit. We did a whole lot of things in a short period of time: MOMA, cinema visits, photo walks, the shady clubs of the Meatpacking District, (plenty of) shopping, and to top it all an open mic night at 3rd avenue (where we performed the Swedish anthem from -94: When We Are Digging

Gold in the USA). It was a perfect end to a great period, and while everybody had some tasks regarding paperwork or flight tickets requiring attention we really got time to enjoy it.

To future CETAC members reading this I would like to stress the importance of getting your name right on the documents; it should always be the same as on the passport. Do it right, or you may have to get up at 6 am and go back to JFK Airport in order to address the issue. Thanks to the ASF people for helping us out with this, and all the other preparations they have assisted us with. Thanks also to our advertisers and sponsors, CETAC would not be possible without you!

Personally, I would like to thank my managers Rajiv and Tom for giving me this opportunity, my roommates for loads of fun and all CETAC members for a great year... It was so worth it!

### Anders Olofsson

Age: 23

Company: TIBCO Software

Number of employees: 40 in Seattle, 2100 worldwide

Industry: Business software

Location: Seattle, Washington

Bachelor: Software Engineering

Tasks: Quality Assurance

Best US experience: The 4th of July celebrations.



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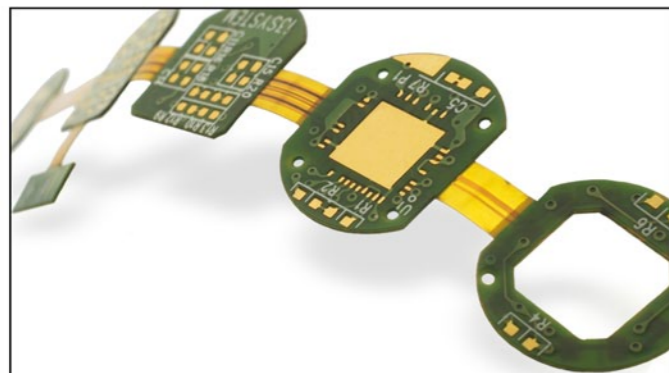
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Text & photos: Alexander Laas

## A Blasting Experience in the North

**On Monday the 7th of June my trip to the US and A started. Stefan, Johan and I were going to take the train down to Copenhagen and fly over to NYC from there. I was pretty excited, I had got my VISA earlier which meant that I could take a flight one day earlier.**

I had rebooked my flight and as far as I knew everything was in order. But on the way to the train station I got a funny feeling, I recalled what I told the girl at Iceland Express that handled my phone call, "I have a flight this Tuesday and would like to reschedule it to Monday". I looked at my ticket and saw that it was for Monday the 14th, the day I was supposed to start work, obviously a huge mistake. I had a moment of panic but realized that the only thing to do was to hope that I could solve this on the way to the airport. Unfortunately I could not and not on the airport either, but after

arguing with most of the airport staff I was able to get on a flight the next day so I ended spending my first night in Malmö, a great city but I could not really appreciate it at the time.

The next day I finally took off, after spending some more time arguing with the Kastrup Airport staff that at first could not find me in their database. At the time I was really glad my internship was not in Denmark. When the plane landed on Newark and I got through the security controls I felt a big relief, I was finally here.

New York seemed great, this was my first time in the United States and I was eager to see all the big tourist attractions. The first thing that I did in New York, with the rest of the CETAC members, was a visit to the ASF building. There they gave us a warming welcome, breakfast and a presentation of the activities at ASF. After that the next few days were just a big run through, in order to be able to see as much as possible. This included

everything from Wall Street to an Amish neighborhood in Brooklyn.

After an awesome week it was time to move on, Anders and I flew to Seattle where I took a connecting flight to Bellingham and from there to Sedro Woolley, the place where I was going to spend my next three months. I had fairly little knowledge about the place at which I had arrived, all I had really heard was that it was supposed to be rainy.

I was going to stay at my boss Neal's house, which is located about 17 miles from work, in a small town called Acme. Everything I had seen so far of this country had been tall buildings, crowded streets and yellow taxi cabs. Acme was quite the opposite all you could see was mountains and forest. Clearly a part of Washington that suits the person that likes outdoor things, and the clear air was a nice change to the polluted air of New York.

After a calm and quiet weekend it was

time to get to work. Rothenbuhler Engineering is a family owned company that was founded in 1946. They are specialized in RF circuitry, and provide various solutions for the mining and logging industry as well as banking security. My job was in the engineering department. Here they worked on developing new products as well as improving existing ones. Rich, the engineering manager was not there the first week but he had left me a list with a bunch of things to do. I was assigned to a project that a previous intern had worked on, it was for a new commercial product for the mining industry. The previous intern had selected most of the parts and made a schematic for it. My job was to make it work. At a first glance it seemed like this was going to be impossible but after a couple of weeks of reading data sheets and tutorials I was starting to get the hang of it with some help from my co-workers.

During the weeks I tried to stay as busy as possible, it was not too hard. Almost everybody I met offered to take me out to do things. Like I said before there are a lot of outdoor things to do here, hiking, mountain climbing, bicycling and especially a new hobby that I have discovered, downhill mountain biking. As far as the weather goes it has been warmer and clearer here than most of the summers I have had in Sweden.

During my time here I have learned a lot, my experience of working with microcontrollers and RF circuitry was previous almost non-existent, Now I feel like a pro. I have made a lot of friends and seen very interesting places. Thanks to all who helped me with this trip and thank you Rothenbuhler Engineering for giving me the opportunity to come here.

### Alexander Laas

**Age:** 24

**Company:** Rothenbuhler Engineering

**Number of employees:** ~30

**Location:** Sedro Woolley, Washington

**Bachelor:** Engineering Physics

**Best US experience:** Mountain biking at Mt Whistler



*" I was assigned to a project that a previous intern had worked on, it was for a new commercial product for the mining industry."*



*" ... the clear air was a nice change to the polluted air of New York. "*





Text & photos: Mikael Doverhag

## Testing Virtual Networks in Silicon Valley

And once again it hits me, I am automating stuff for a living in a high-tech Silicon Valley company. It is definitely keeping me busy, and it is probably my biggest dream coming true.

It feels like yesterday when I started out at the Computer Science program at Chalmers University. Mostly driven by curiosity of how those things called computers were doing their magic I decided to move to Gothenburg and

try this engineering thing out. A lot of things were new and some of my questions about computers became answered fairly quickly. At the time, this was something I was awesomely happy about. Going from that, I guess you can imagine that someone like me would consider working with that kind of stuff in a company doing something as unique as virtualized networks three years later to be pretty darn cool.

The company I ended up at is called Nicira Networks, Inc. and I was lucky enough to get a position as a QA-

intern in this quickly growing Silicon Valley start-up company. For those who are not familiar with the term QA, this is the acronym for Quality Assurance. In practice this means that I test things and in my particular case I do this through writing software that does this testing in an automated fashion.

The company is highly specialized in network and in particular virtualized

### Mikael Doverhag

**Age:** 23

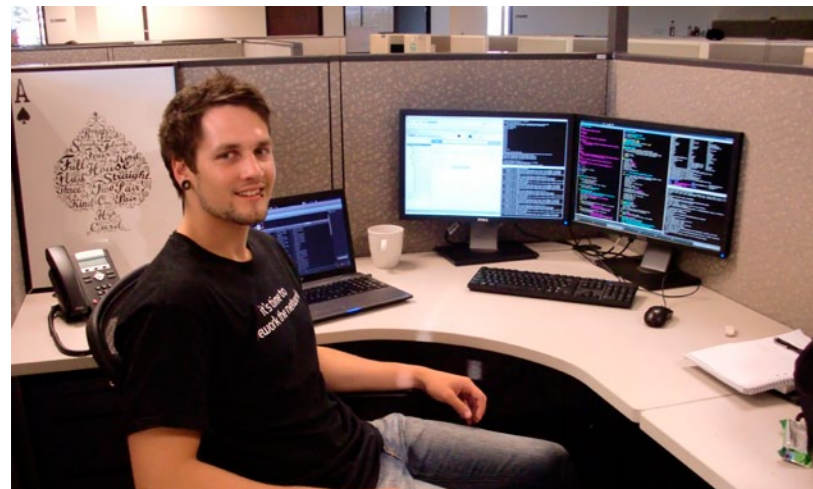
**Company:** Nicira Networks Inc.

**Industry:** Network virtualization

**Location:** Palo Alto, California

**Bachelor:** Computer Science & Engineering

**Best US experience:** Yosemite hiking with friends from Chalmers.



It's time to rework the network.

ones. One branch of the company is working on an open source project called Open vSwitch, which is basically a piece of software implementing switching hardware. Main thing though, is that it also adds a lot of additional functionality typically needed to make a complete network virtualized. This device can be put to be doing the switching for a Hypervisor (also called a Virtual Machine Monitor) or possibly a Linux kernel.

Looking at this from the Nicira QA-team's perspective, we come into the picture when developers have done their job and the functionality is about to be



Daily errands with my and Stefan's car.

validated. The general idea is that we get or create a functional description of how some part of a program should behave in certain situations. From this we make a test-script, which in our case is written in Python., which if it passes makes us confident that the functionality is indeed as described. I have done such a script to assure the functionality of a Command-Line Interface and a script that looks for inconsistencies between different kinds of databases. Adding to that I have had the opportunity to work with the QA-teams back-end testing libraries a lot.

Having a Computer Science related background, I realized that getting an opportunity as a QA-intern in a high-tech company like Nicira is a very favorable position to be in. Mainly since it actually enables you to use things learned in school and put them into context by using them on a daily basis. For me this includes learning to program better in my favorite programming language and

start making more maintainable and reusable code. I am also getting a lot more experienced working in a UNIX-like environment, and I get to know what kind of analysis tools and debuggers that could help me out in the future.

So all this is done in Silicon Valley, California, as the company office is located in Palo Alto around two miles away from the Googleplex (Google headquarters). In addition to those guys, the company is also closely located to both Facebook and VMware headquarters as well as Stanford University. I would like to believe that this small area is the place that contributes to the things you see on the interwebs the most.



Photo: Johan Borglin

I do work a lot, and this is mainly why I am here. However, as I suspected, the U.S and A is filled with huge amounts of other cool things to do outside work as well.

I live together with two other Chalmers students in a town about twenty miles south of Palo Alto called Cupertino. My view of this place is that it basically consist of two things; suburbs and Apple. As we live around five blocks from the Infinite Loop (Apple headquarters) every second house around the area north of us has the famous logo on it. We live in a three-bedroom apartment where we have access to a nice pool and with two cars in the household we feel somewhat Americanized. I would say it is a great

place to live in since the weather is always nice and it is very clean. Other than the local pub or the movie theater you would have to go somewhere else to have a good time however.

That is usually the case on weekends and so far we have been hiking in Yosemite, wine-tasting in Sonoma, making a couple of trips down to Santa Cruz along beautiful highway 1, trying out San José nightlife as well as randomly visiting frat houses in Berkeley. In addition to that, there have been a couple of late night sessions, not to mention a Tool-gig in San Francisco, which is a nice, different, but very cold city. Currently working a full weekend doing what I see as the less exotic part of being in QA called regression testing. This will enable me to take some time off when my family is coming over to visit. San Francisco sightseeing including Alcatraz and a

Enjoying the view of Alcatraz from Russian Hill in San Francisco.



Lake Tahoe at Zephyr Cove.

weekend around Lake Tahoe is on the agenda. There is a lot of interesting and fun things to do in this part of California.

Finally, to wrap this report up, I would like to thank QA manager Henrik at Nicira for bringing me to the company. In addition, I would like to thank the whole QA-team for the huge amount of hints, feedback and support both when it comes to job-related stuff just as well as pleasure. Your support have been a big help and have contributed a lot to my experience.

Other than that, I will be in the area until Christmas, enjoying the awesome Mexican food. Over and out.



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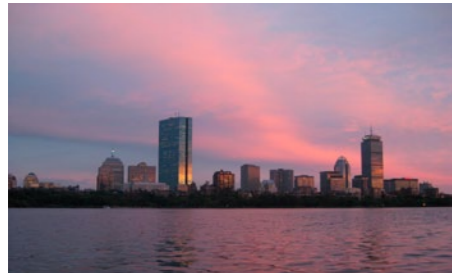


# A Summer in America's Most European City

Text & photos: Annelie Forslund

The warm humid weather has put itself as a blanket around my frozen Nordic body. Do not be fooled by Boston's high longitude, during this summer there have not been many days with temperatures under 30 degrees Celsius.

Boston is one of the oldest cities in the US which you can see on its many old buildings with relatively European architecture. Besides the nice architecture being an old city brings other benefits such as a developed subway and bus system. This is great for all of Boston's Harvard, MIT and BU students, but also for Swedish interns who can save money by not having a car.



I am working as a trainee at Sunnex Inc., a company that originates from Sweden and has got its name from the Swedish town Sunne. It still has connection to Sweden in the form of a Swedish owner and Swedish CEO. The company is producing industrial and medical lights and its market is world wide. My internship started with learning how to use the 3D drawing program SolidWorks, a program I never worked with before. I created 3D and 2D drawings of lights and other objects they needed drawings for. The internship went well and after 1,5 months they extended it from 2,5 months to 6 months.

One of Sunnex's projects is to develop a new minor surgery light. This is the project I will be working on for the majority of my internship. They have never developed a surgery light before and are now

working with sister companies in China who are developing the actual technology for them. My work in this project is to help Sunnex with all the parts of the development that is done by us. That includes amongst other things the design of the control panel and parts of the arm system. I have been working a lot in SolidWorks making drawings of the arm system and control panel which are being sent to vendors for quoting. Seeing what we do in 3D is also very helpful for us in our understanding of the problem.

Living on the east coast in such a big city as Boston you will not see so many "typical" Americans. Not as they can appear on TV anyway. The people in Boston is actually pretty normal... well except for their huge interest in sports. The big baseball team Red Sox comes from Boston and the Bostonian people like to show their support by wearing Red Sox team shirts EVERYWHERE. Since I am not a baseball fan myself I find this kind of annoying. I take the train to work every day and that same train happens to be the train that runs pass Fenway, the home off The Red Sox. This means that I often need to sit in a crowded train on the way home from work with all these people heading into town to watch their favorite team play. Luckily they seem to be able to act as human beings and not like apes as some of our soccer hooligans can do. I have seen one Red Sox game played at Fenway and I can seriously not understand the hype! The game is slow, very slow and takes about three hours.

After living in Boston for a while I have noticed one thing, you will never love Sweden as much as you do as when you live abroad. After living abroad for a while you might notice how important it is to be able to buy "lösgodis" (pick & mix candy), even though you might not even use to eat it so much at home. Going to IKEA (if you have the fortune to have one close to your city) will feel like Christmas. You can actually buy lingonsylt, Herrgårdstost, Marabou and small shrimp there. What a luxury! One other thing that you might miss is the Swedish fashion. Americans dress a little different from what people in Europe use too. But do not fret, if you have any problems finding those "jeans leggings" you really want, do not worry, many of the bigger cities do have an H&M store!

Seeing your home country through the



## Annelie Forslund

**Age:** 24  
**Company:** Sunnex Inc.  
**Employees:** 15  
**Location:** Boston, Massachusetts  
**Bachelor:** Engineering Physics  
**Best US experience:** Getting to know Kelli, my first roommate who has become a very dear friend of mine.



eyes of curious American friends do make you understand more about yourself and your origin. It is so easy to take your every day life for granted and you do not even think about all the things that is special about Sweden and its culture. We do have a rich culture and an old history. It is very easy to forget to be proud of that. I visited a Swede who is living permanently in Boston right now. When I came to his house I noticed right away the Scandinavian touch in the interior design. And while I was entering his living room I saw a book shelf and on that book shelf a big traditional candelabra from Dalarna. Next to that candelabra were a lot of small Swedish decorations. Those type of decorations you can see in the tourists shops in Sweden and everybody thinks they look awful and would never let them enter their homes. Well there I was looking at them in a Swedish American home in Boston. You will never love Sweden as much as you do as when you live abroad!



## THE AMERICAN-SCANDINAVIAN FOUNDATION 2010

The Chalmers Engineering Trainee Appointment Committee (CETAC) of Chalmers University of Technology and The American-Scandinavian Foundation (ASF) began working together back in 1980. Since then, the Foundation has provided visa sponsorship to hundreds of CETAC members in the fields of electrical engineering, software engineering, electronics engineering, engineering physics and computer programming, among others.

The American-Scandinavian Foundation is a publicly supported non-profit organization located at Scandinavia House, the Nordic Center in America. Founded one hundred years ago, the ASF fosters cultural understanding and exchange between the U.S. and the Nordic countries through fellowships, cultural grants, internships/training, publications, exhibitions and other public programs.

The American-Scandinavian Foundation's Internship & Training Department, designated by the U.S. government as an Exchange Visitor program sponsor, provides young Scandinavians and Americans with the unique opportunity to receive practical on-the-job experience abroad. Approximately 200 Scandinavian students and young professionals participate in the program each year in a number of different fields, including architecture, law, business, design, journalism, and, of course, engineering.

In order to receive visa sponsorship, prospective interns and trainees must complete an application and their host firms are required to provide an internship plan. Once ASF confirms that the internship is appropriate and meets program requirements, it issues the US government documents required by the U.S. Embassy for an Exchange Visitor J-1 visa.

Once in the US, interns have the opportunity to dive into American business culture and put their knowledge into practice. And host firms reap the benefit of adding a highly motivated and skilled young person to their staffs.

Congratulations on an excellent and productive year CETAC 2010. It was a pleasure working with all of you. I hope that you had a wonderful experience here in the U.S. Your energy and ambition are sure to take you a long way and I wish you nothing but success for the future!

ARIANA TIZIANI  
 The American-Scandinavian Foundation

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ASF shares information on Scandinavian topics through its journal *Scandinavian Review* and its membership newsletter *Scan*.

### CETAC 2010 FACTS

**10**  
The total number of interns that participated in the CETAC/ASF program for the 2010 year.

**7**  
The total number of states that students interned in.

**5.5**  
The average length of 2010 internships in months.







# At the Heart of the Wild West

Text & photos: Emil Backlund

Bisons that blocked the road in Grand Teton National Park.

Finally after one year as a CETAC member, dealing with a broken tendon in my foot that led to surgery and finishing my bachelor degree it was time to leave Sweden for Laramie, Wyoming.

The trip to Laramie began on the 4th of June with a flight to New York. When I and a few other CETAC members arrived to New York it was baking hot, about 95 Fahrenheit and insane humidity. After a week which included running in Central Park, shopping in Mid-town and a day-trip down town with pizza at the famous Grimaldi's pizza in Brooklyn it was time for me to leave New York and travel to Denver where Even Brande, the CEO of Handel IT, was picking me up.

After a four and a half hour flight and a 2 hour drive I finally arrived in Laramie, in the heart of the Wild West. Laramie which is in the state of Wyoming is the place where William Frederick "Buffalo



**Emil Backlund**  
 Age: 22  
 Company: Handel Information Technologies  
 Number of employees: 24  
 Location: Laramie, Wyoming  
 Bachelor: Software Engineering  
 Best US experience: The run down from 3150 m above sea level during the 15th leg in the Wild West Relay

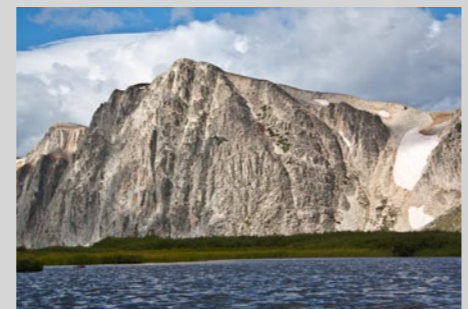
Bill" Cody grew up and once rode through as a rider for the Pony Express, the fastest way to get information transferred from the west to the east. In comparison, coming to Laramie was like coming to whole a new country. Not only are people here a lot more genuine but Laramie actually sits on an elevation of 2200 meters which I clearly noticed during my first run in Laramie.

Handel Information Technologies is a software company that creates software solutions for human agencies, especially for Native American tribes and juvenile justice courts. In difference to many software companies Handel customizes every system for the customer in order to make the system suit that customer's workflow. To accomplish this Handel uses a Rapid Application Development methodology where the customer's solution is created using pre-built modules in Handel's design environment called DesignStudio. Every Friday all employees gather for the weekly meeting where every department presents their progress. This enables all employees to know what is going on in

the different parts of the company and is one of the things that I appreciate about Handel. I also have come to appreciate all the off-site events that the company does, for example the Handel Picnic that we had a few weeks ago.

During the first two months my work was mostly focused on recreating and solving tickets (bugs in customer systems). With customers using different versions of RiteTrack, the general name of our software, I had to use both new and old technologies Access 2000 to Silverlight 4. Solving the bugs included changing T-SQL code in views and store procedures, changing C# code or changing some setting in DesignStudio. This work also included a lot of communication with customers.

After about two months I started to solely work on billable projects, projects that aim to add additional features to the customer software. So far I have worked on two projects. The first one was to integrate the Canadian Postal Codes with the US Zip codes that already existed in the database. This project included finding a reliable source to buy the Canadian postal code data from and develop the integration code in SQL and C#. The second project was to add a report to the software of one of our tribal customers. This report required a lot more planning and coding. Since it was crucial that the text in the report file was



exact I verified every class with unit tests.

My time so far in the Wild West has been incredible. It amazes that there are so many people in this area that have some connection with Sweden, everywhere I go I seem to meet people Swedish ancestors. I have experience lot of the Wild West including watching bull-riding, Lakota Indian dancing traditions and seen where the Oregon Trail once went through. I really enjoy learning about Wyoming and its history.

In the northeastern corner of Wyoming you will find Yellowstone, the first US National Park and one of the most famous national parks in the world. Being as close I am, I just had to go there. As I am writing this I recently went to Yellowstone with my parents who came to visit and I must say that it is as beautiful as everyone say it is. Instead of going straight to Yellowstone we first went to the town Cody, which was founded by "Buffalo Bill" Cody, and stayed there during our first night. The next day we proceeded to Yellowstone. What amazed me was that when we were driving the spruce and pine forests looked a lot like forests in Sweden. But when I got to the many geysers, for example the Old Faithful, or saw the wildlife I quickly realized that it really was

not. The second day in Yellowstone we did what everyone being in Yellowstone should do, we woke up at 6 am and drove down to Hayden Valley, one of the most mammal crowded areas. Not only did the nature show itself from its most beautiful side, with steam coming up from the river, all mammals are most active during this time. We got to see two elk males comparing their strength, bison about one meter from our car and we almost got to see a grizzly bear. Unfortunately the bear decided to stay behind the fog and not come down to the river. At least we got to see a black bear with a cub when we got into Grand Teton National Park which connects to Yellowstone in the south. It amazes me that even though there is a lot of tourists in this area the animals get to be living in the natural habitat with close to no interference with humans, except for car accidents.

Some other things I have experienced; the exceptional beer produced by micro-breweries in the area, running a 200-mile relay with a few of my colleagues, Mount Rushmore (with the presidents carved in to the mountain) and Devils Tower, a volcanic neck that rises 386 meters above the surrounding terrain, which for a lot of native tribes is considered holy.

My current status is the following, it is the end of September and my roommates recently moved in again after the summer holiday. As I feel that I am obtaining valuable experience and have noticed that I have a lot to contribute with, thanks to my education at Chalmers University of Technology, I have decided to work for Handel IT for a whole year. In a couple of months I will move down to the basement to join the product development team. As a coincidence an orienteering event called Laramie Daze was held just outside of Laramie and I got to run my first orienteering races since August last year and it felt awesome to be able to run in the forest again.

Finally, I would like to take the opportunity to thank Even Brande for making my time in Laramie be as smooth as possible. I would also like to thank my colleagues at Handel Information Technologies for all their support and for letting me explore Wyoming and its surrounding area. They have really made my time here in Laramie a great one and I am sure that the rest of my internship will be as great as it has been so far.



My colleagues and I at the finish line of the Wild West Relay.







## iPhone på populärt besök i fabriken

Text: Jan Strandhede

**En iPhoneapplikation för att presentera arbetsinstruktioner i Volvofabriker, det är vad två masterstudenter på Chalmers har utvecklat i samarbete med bland andra Volvo IT, Volvo Lastvagnar och Volvo Powertrain.**

Den produktvariation som finns i moderna produktionssystem leder till en stor mängd olika monteringsinstruktioner. En mobil lösning, som iPhone, där allt finns samlat gör att montören slipper bläddra i pärmar eller ta onödiga steg fram till en dataskärm.

iPhone har även kapacitet att visa bilder, filmer och ljud för att komplettera textinstruktionerna. Förutom förbättrad kvalitet på instruktionerna kan iPhone bidra till ökad produktivitet.

De två studenterna från Chalmers utbildning inom Production Engineering, Tommy Fässberg och Gustaf Nordin, har skrivit sin ettåriga masteruppsats på avdelningen för produkt och produktionsutveckling. Uppsatsens fokus ligger på monteringspersonalens arbetssituation och behov.

–En stor del av projektet har ägnats åt att

kartlägga nuvarande situation och förstå monteringspersonalens framtida behov, förklarar Tommy Fässberg.

iPhone fungerar också som en social plattform för personalen i fabriken och kontorsrelaterade verktyg som e-mail öppnar nya möjligheter för till exempel HR-funktionen att nå ut med information. Fyra entusiastiska montörer på monteringslinan vid Volvo Powertrainfabriken i Skövde, fick nyligen möjlighet att testa den iPhonebaserade applikationen. De var mycket nöjda.

–Jag är positiv, men det är viktigt att det inte blir för mycket information. Det är skillnader mellan modellerna som man är mest intresserad av, säger Martin Högborg, en av montörerna.

–Konsumentelektronik är numera den drivande kraften bakom mycket av den teknologiska utvecklingen inom elektronikområdet och vi tror att kommersiella produkter har sin givna plats inom framtida produktion, säger Gustaf Nordin.

–Nu har vi utvecklat för iPhone OS, men

imorgon kan det vara för Android. Det är viktigt att använda en struktur som är öppen och flexibel så att den kan användas för att hantera olika typer av enheter och utnyttja deras fulla potential.

Masteruppsatsen markerar slutet på den långa utbildningen och båda är nu redo att ta steget ut till industrin.

–Volvokoncernen är en väldigt intressant arbetsgivare, med sitt stora fokus på produktion. Vi tror det finns en stor potential att öka produktiviteten genom att använda ny teknik och ”lean” produktion som filosofi, avslutar Tommy Fässberg.

### Fakta:

På uppdragsgivarens sida är det Volvo IT, Tech Watch & Business Innovation som har handlett studenterna.

Uppsatsen är ett led i arbetet med att utforska hur ny teknik kan skapa affärsvärde. Den bygger på resultat från tidigare prototyper och ett koncept framtaget inom det EU-finansierade My Car-projektet där bland andra Volvo IT och Chalmers deltog.

### Radars Performance Measurement Applications and Instruments

Ranatec Instrument AB utvecklar och exporterar mätinstrument och komponenter för radarapplikationer. Vi söker ständigt efter duktiga medarbetare med relevant kompetens och höga ambitioner. Är du en stark personlighet med bra värderingar och rätt attityd? Vill du utvecklas i ett företag, där du har möjlighet att påverka din framtid?



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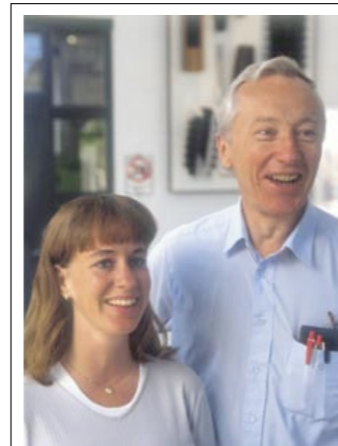
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# haglundindustri ab



# A View From Berkeley Hills

Text & photos: Johan Borglin



**Berkeley is different. It does not really matter what you compare it to, it is still different. During the years this small city has been home to hippies, academics, revolutionaries and Nobel laureates, and during the cold summer of 2010, it was my home also. This is what happened;**

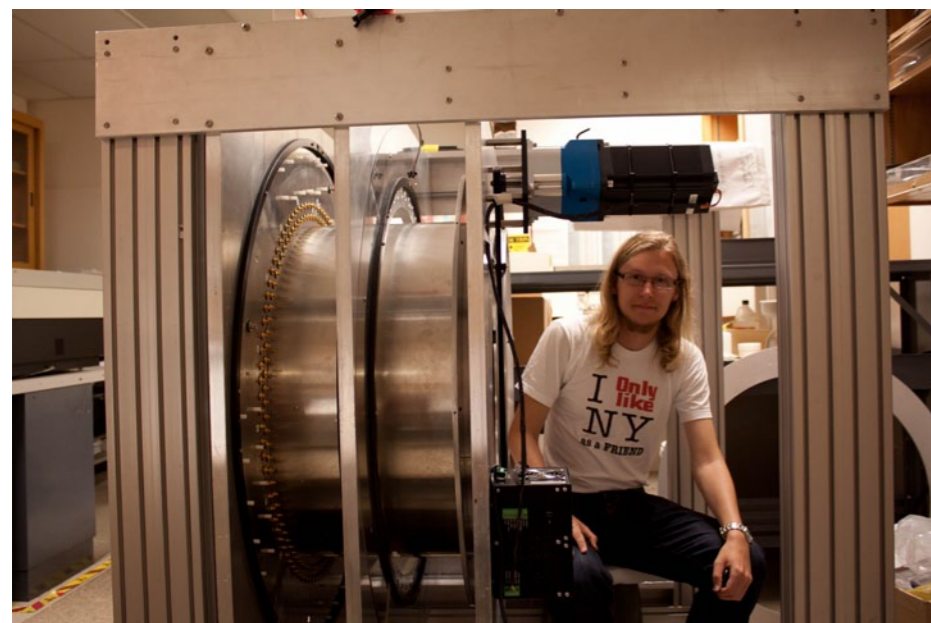
After a few really nice days in New York, and after leaving the last of my friends at San Francisco International Airport, I was all alone, on the other side of the world. Fortunately, Martin, my host in Berkeley, soon found me and him being one of the few people in the US to care about the world cup, we quickly drove across the Bay bridge to Berkeley and a local

bar where we watched the England-US game. (1-1, England scored both goals.) With this formality taken care of, he took me to the hostel where I spent the first nights before I got my apartment, and told me all about the work I was going to do during my stay.

I spent my days working at the Lawrence Berkeley National Laboratory, at the Life Science Division. They do a lot of work on different medical imaging techniques, and mass-produce and screen crystals to find the perfect material for radiation detectors. I soon became involved in several different projects, but my first and largest project was on a TOF-PET-camera which the group was working on. PET, short for positron emission tomography, is a medical imaging technique where a radioactive source is introduced into the patient on a biologically active

molecule. By monitoring the radiation being emitted from inside of the body, information about for example the metabolism rates of different organs can be extracted. This is vital when searching for something like a cancer tumor. TOF stands for Time-of-Flight, which is a technique to increase the resolution by measuring the time difference between the two detectors that register the radiation event, and a more precise location for the radiation event can thus be determined.

My task was to get a small radioactive source to rotate around in the camera, to allow the detectors to measure the attenuation of the patient at different angles. While this does not sound too hard, it involved quite a bit of programming in LabView, some research into getting the right motor controller, and a lot of meetings discussing the project and what the group wanted the program to perform



## Johan Borglin

Age: 24

Company: Lawrence Berkeley National Lab

Number of employees: Lots of employees

Location: Berkeley, California

Bachelor: Engineering Physics

Best US experience: All the nice people I

met, closely followed by Yosemite.



and report. In the end I got everything working on a processor very much like the one they are going to use in the end, but I did not have time to convert it to the language of the final processor. Still, the algorithms are there, so it should not be too hard.

My other projects included programming a controller for another rotating measurement set up, for which I could use a lot of code from my big project. Martin also had me running back and forth from our building to another lab across a parking lot, where I did reflectivity measurements on different materials commonly used in medical imaging. 13 minute measurements in a room where I could not work due to the noise from the machines, meant that I went over that parking lot about hundred times during the two weeks we did the measurements. This might seem a lot, but the parking lot had a wonderful view of San Francisco and the golden gate, and it was nice to get some exercise. As another side project, I made a black hole.

I spent most of my spare time in Berkeley, walking around with all the beautiful people who lived there, or up on the hill, watching the sun set in the Pacific, with San Francisco at the horizon. I think I have never met so many nice strangers in my whole life. People were noticeably more open than in Sweden, and I made quite a few friends just walking around or hanging in bars.

The people of Berkeley really were not what I expected from Americans. They

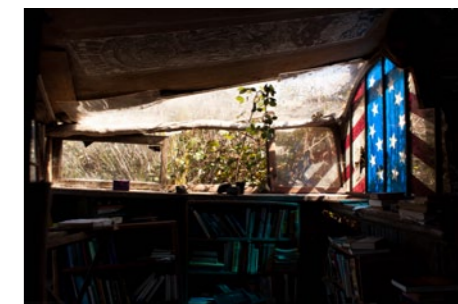
shop ecological, bike and walk, and eat relatively healthy. Everyone seemed to care for each other, and if you had something that you did not need, like old furniture, you would put it out in the street so that someone else could take it and use it.

I often took the train to San Francisco, alone or with Lea, the girl with whom I shared my apartment, or with the others from CETAC who lived in the area. It is really a beautiful city, especially if you get away from Market street and stay well away from the Tenderloin. It is just a pity that the fog stayed over the city for almost the whole summer.

In between all this, I also had time for some excursions in the area. The five Swedes in the bay area did a wonderful road trip to Yosemite, a national park, and one of the most beautiful places I have ever visited. We also did wine-tasting, bicycling in San Francisco and a trip to a hobo library which I found out in the wilderness.

All in all, I had a wonderful time, and I learned a lot about working in a team and how things are done in America's most different city. I will miss all the awesome people I met, and would like to especially thank Martin, Bill, Peng, Dave and Lea for making this a very special summer. I will end with quoting the Governor of California; "I'll be back".

For more pictures and a Swedish diary/blog, see [blakeandfulton.blogspot.com](http://blakeandfulton.blogspot.com)





## Virtual Manufacturing Research at General Motors



Photo: Copyright Downtown Detroit Partnership

For summer interns at the General Motors Manufacturing Systems Research Lab in Warren, Michigan, the challenges and opportunities are many. We offer an environment of skilled work together with our scientists and engineers, striving towards efficient design and validation of all aspects in our manufacturing systems.

### General Motors Global R&D and its Collaboration Partners

General Motors Global R&D is headquartered in Warren Michigan with additional laboratories in Bangalore India, Shanghai China, Tel Aviv Israel, Mainz Kastel Germany, and science offices in Canada, Russia and Korea. Dr. Bob Tilove, Technical Fellow and Group Manager, leads the Virtual Manufacturing Research area, collaborating with his global GM R&D colleagues and with many universities, consortia, and industrial research labs worldwide. One of these research labs is the Fraunhofer-Chalmers Research Centre for Industrial Mathematics (FCC) located in Gothenburg, Sweden. FCC, founded in 2001, undertakes and promotes scientific research in the field of applied mathematics to the benefits of industry, commerce, and public

institutions. To do so the Centre undertakes scientific research and marketing financed by the founders and by public institutes and works on applied research projects defined by companies and industrial partners. Virtual manufacturing has become one of the most important areas of research for FCC.

### Virtual Manufacturing in the GM Global R&D Lab

The objective in virtual manufacturing is to be able to effectively design and validate all aspects of the manufacturing system to reduce product development time and cost, to improve product quality, and to enhance the safety, comfort, and efficiency of the operators. A typical high volume automotive assembly plant consists of a body shop (joins sheet metal panels to form the unpainted vehicle body, doors, hood and decklid), a paint shop (applies and cures coating, sealers and paint), and general (or "final") assembly (installs everything else). Our customers are the manufacturing engineers responsible to design and validate these processes for new vehicle programs, and the operators and engineers on the plant floor. GM's outstanding research

collaboration with FCC focuses on general assembly and paint.

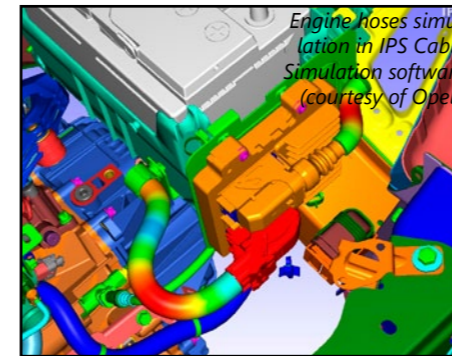
### Simulation of Assembly Operations

One of the key challenges in virtual manufacturing for general assembly is to be able to simulate and validate assembly operations performed by human operators manipulating both flexible and rigid parts. For geometry, today's CAD/CAM systems rely on fundamental research in solid modeling dating back to the mid 1970s. Although great progress has been made since then regarding the complexity (or "size") of the models and assemblies that can be efficiently manipulated and visualized, the domain remains re-



Fraunhofer-Chalmers Centre

stricted to rigid solid objects and mechanisms with rigid links. FCC researchers are developing the tools and science to enable the domain to be extended to include flexible parts, like hoses, cables, wiring harnesses, floor mats, and headliners (etc) that make up much of the vehicle and that are, for the most part, manipulated and installed by human operators in final assembly. In solid modeling, a lot of attention is paid to efficient algorithms for collision detection. With flexible parts, the question is not "do these parts collide?", but "how do these parts deform when they are manipulated and come into contact with other rigid or flexible parts, and what forces are required to manipulate and deform them?" This is a key step in moving from today's "solid modeling" to tomorrow's "physical modeling" systems.



Engine hoses simulation in IPS Cable Simulation software (courtesy of Opel)

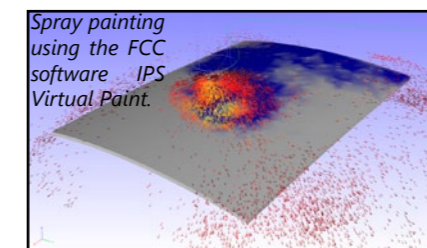
### Virtual Paint Shop Simulation

GM's second area of collaborative R&D with FCC also focuses on physical modeling, but now, for the paint shop, where the primary R&D challenge is to develop and implement sufficiently accurate and efficient computational fluid dynamics models for paint processes such as electrostatic spray painting, paint oven curing processes, and other kinds of coating/sealing operations. Of course, physical laws and equations governing these kinds of processes



GM Tech Center

are, for the most part, known, and it is possible, in principle, to solve these equations with standard finite element based CAE and CFD methods. But in order to successfully apply these kinds of computational methods and simulations to support production vehicle development, it is necessary to create the CAE models, complete and interpret the simulations, suggest and possibly simulate proposed changes, in a very short period of time and with reasonable engineering and computational resources. And also, it is necessary to have the right kinds of input data for these models, for example the distribution, size, charge, and velocity of paint droplets from a rotary bell paint spray nozzle. FCC is developing sophisticated computational methods and software for specific automotive paint processes.



Spray painting using the FCC software IPS Virtual Paint.

### Leisure Opportunities of Warren, Michigan

Aside from the research challenges and the remarkable scientists and engineers of General Motors, summer interns at R&D might enjoy some of the outstanding recreational and cultural opportunities nearby:

- Mackinac Island
- Detroit Tigers at Comerica Park
- The Woodward Dream Cruise
- Michigan Renaissance Festival
- Henry Ford Museum
- Detroit Institute of Arts
- Fox Theater in Detroit

#### GM Contact

Dr. Bob Tilove, Technical Fellow and Group Manager

#### FCC Contact

Dr. Johan S. Carlson, Vice Director and Head of Department



# San Francisco IT

Text & photos: Carl Wålinder



**My time in the US started with an amazing week in New York City with the rest of the members in CETAC. The week contained a lot of sightseeing, photography, and an occasional hamburger or two. After a well spent week in the "Big Apple", five of us headed west to the "Golden State".**

When I first got to San Francisco I stayed at a very cozy hotel with a friend of mine. My intention was to stay at the hotel until I found a place to live permanently. However it only took a week to find a permanent place to live. The place I found was a big house in a calm neighborhood in San Francisco. The house was shared among six roommates, each of which was a middle aged professional with a busy life.

After finding a place to live I began work at Cypress Security, LLC (CPS) as an In-

formation Technology Representative (IT). CPS started in 1996 and has around 550 employees spread throughout the states of California, Arizona, Nevada, and Washington. Cypress Security offers a wide range of security solutions for all kinds of businesses.

As an IT Representative my role with the company is to continue the development of its online based training modules. This is a really exciting challenge for me since I am the only IT Representative in the office. Being the only representative allows me to be creative and to use my own discretion to determine how the final project will look. I appreciate the fact that working at Cypress gives me the opportunity to complete many different assignments. Since working with the company, I have noticed that people are always given the chance to try different assignments, often in different fields allowing them to gain more knowledge and a better understanding of the company.

After being in the US for about a month I knew one of the biggest American holidays was coming up, 4th of July. What could be better than celebrating this the American way, with barbecue and a lot of friends. The only problem was that we did not have a barbecue grill, but this did not stop us from fulfilling the dream. We bought some food and went to a park in hopes of finding a couple of friendly Americans that would offer us some space on their barbecue grill. It went great and we ended up having a really great time with a lot of tasty food and fun games.

One afternoon at work a friend called, and asked me if I had any plans for the weekend. I was a little curious because he sounded very excited. I came to learn that this was because he just received two VIP tickets for the weekend NASCAR event. He offered me one of the tickets to attend the event, and I accepted. The event contained free food, luxurious seats, goodie-bags, and of course an awesome race.

After nearly two months in America without my girlfriend she finally took a trip over to visit me. Since she traveled a long distance, I wanted to make sure she enjoyed her time here. The first thing I did was rent a car. After renting a car, I picked her up from the airport. So far so good, but on the way home from the airport it began to get really foggy, the low visibility made it difficult for me to find my back home. It took some time but we eventually arrived home safely.

The next day we began our road trip to LA. Our goal was to drive as far as possible without making any unnecessary stops, so we could enjoy the evening in LA. That was more difficult than we thought, since the drive down had a lot of fun stuff to offer. We stayed in Los Angeles for three nights, I think we managed to do all the touristy stuff the city had to offer; Universal Studios, Venice Beach, Hollywood which included a movie star tour, and much more.

Since I was living in California there was a lot of things that I just had to do. One of them was to visit the famous national park Yosemite. Five Swedish guys packed a car and took off one Saturday morning. I was living in the foggy city of San Francisco and had not really felt the warm weather that the country had



Photo: Martin Ohlsson

to offer yet, but when we arrived at Yosemite it was super hot. The nature of Yosemite was amazing, and we managed to see waterfalls, treks, rivers, and of course the legendary Half Dome in only two days.

I would like to complete this story by taking the time to say thank you to everyone that made this trip possible for me. I would like to especially thank the companies that bought ads in our Trainee Report magazine and last but not least I want to thank Cypress Security and its CEO Nils Welin, who gave me this opportunity to come over and work at his company. This has been an amazing journey and a great experience for me. Thank You!



## Carl Wålinder

Age: 22

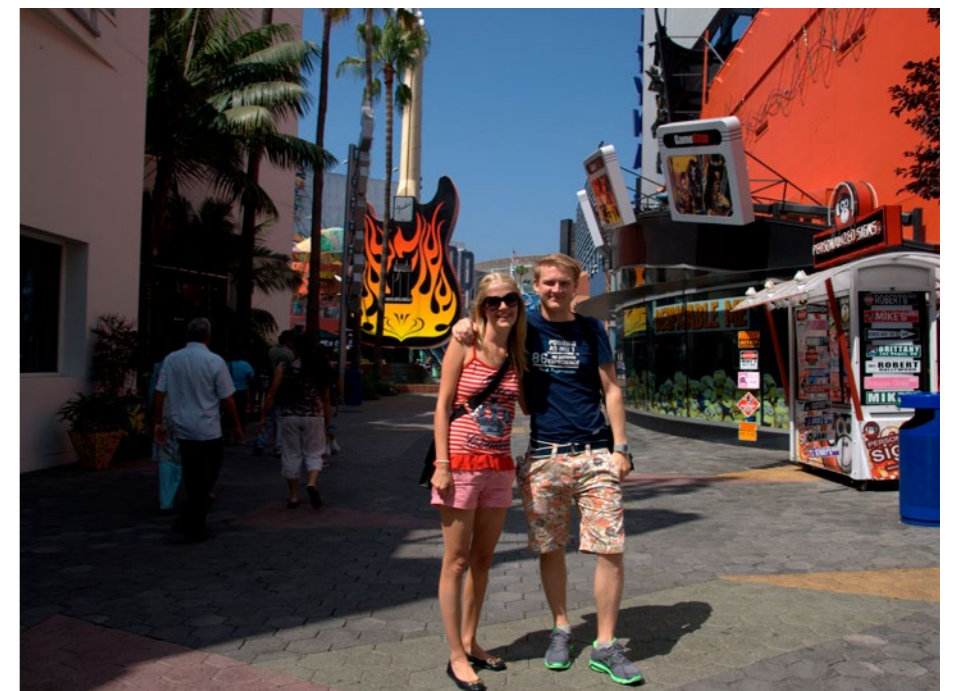
Company: Cypress Private Security

Employees: ~550

Location: San Francisco, California

Bachelor: Software Engineering

Best US experience: The road trip to LA.







# Taxation Without Representation

Text: Erik Nilsson    Photos: Martin Ohlsson

On vacation airboating in beautiful Everglades, Florida...



... hoping to find an Alligator in its natural habitat.

**"No taxation without representation"** was a slogan used during the 18th century illustrating one of the major causes to the American Revolution.

Nowadays it is used by D.C. citizens to show their dissatisfaction with having to pay federal taxes without being represented in the Senate, and you could see the slogan written on vehicle license plates issued by the city. This kept reminding me that I was in the political center of America, since where else would you expect to find political messages as slogans on license plates.

After an intense and exciting weekend in New York, it was time for me to jump on a train for my next destination, College Park, a university town just outside D.C. However, in an attempt to save some money on my ticket, I decided to get off in Baltimore instead. A city known to most people in Sweden as the institutionally dysfunctional drug mecca in the critically



acclaimed HBO show *The Wire*. With this in mind and the fact that it was late Sunday night, I wasn't very pleased with the idea of stumbling my way on public transportation to my final destination for a few bucks. Instead I ended up doing what every true American would have done in my place, spending \$100 taxi drive to what would be my home for the next ten weeks.

This was my first visit ever to the U.S and I wasn't really sure what to expect. My senior CETAC friends spoke highly of my workplace and I was told that the area in which I was residing would grant me lots of opportunities to have fun and experience America on my spare time. I was sure I would end up having a great time, but I had no idea how it would turn out, so it was with excitement, confidence and an open mind that I met up with my supervisor for a ride to my first day at work.

I was working at NVI Inc., a contractor to



NASA at Goddard Space Flight Center, a few minutes away from D.C. The company provides support to the Very Long Baseline Interferometry (VLBI) group at NASA, and involved people from various fields such as physics, astronomy, geodesy, geophysics, computer science and mathematics. The concept of VLBI is based on observations of radio sources in the sky from several telescopes simultaneously. It is possible to establish the distance between two telescopes by measuring the difference in time of arrival of different radio sources between the telescopes, and using simple rules of geometry. The accuracy is good enough to measure tectonic plate movements within millimeters.

The most commonly used sources are quasars, which are very energetic galaxies with active galactic nuclei. They are the most luminous objects in the universe, making them possible to observe even at a very far distance. By mapping hundreds of distant



quasars, VLBI is used to establish the International Celestial Reference Frame (ICRF) which is used to define the

rotation. One important application of this is determining a time standard that is based on the actual rotation of the earth, instead of atomic clocks.

**Erik Nilsson**

**Age:** 23

**Company:** NVI Inc.

**Employees:** ~20

**Location:** Greenbelt, Maryland

**Bachelor:** Engineering Physics

**Best US experience:** All the amazing people I've met.

positions of astronomical objects. Even though such a reference frame can't theoretically be inertial, the enormous distance to the quasars makes the ICRF inertial in practice. This makes VLBI a very important technique, since it is the only one that can establish such a reference frame. It is also very important in geodesy as it can be used to determine the orientation of the Earth within the ICRF, providing parameters such as the positions of the poles and Earth's

My project was to analyze time series from VLBI, such as positions of radio sources used, and parameters for the earth rotation. One of the problems with these time series is that the measurements are not done on a regular basis. Sometimes measurements are done several times a day, and sometimes days, weeks or months apart. This means that most common methods for time series analysis cannot be directly applied. Instead one has to make different assumptions and corrections for this irregularity. Although most of the concepts were new to me, the knowledge about mathematical statistics learned at Chalmers proved very useful.

As I was only working for ten weeks and getting a car for such a short time could be very expensive, I needed to be particular about my choice of housing. I found a place through craigslist by the campus of University of Maryland, not very far from NASA and at a short walking distance from the metro station and the local bars and restaurants. The campus itself was very different from what we have in Sweden. Being one

of the largest campuses in the country hosting about 37000 students, it could best be described as a small city with its own police department, public transportation system and a football stadium with a capacity much higher than what Gothenburg and Ullevi can brag about. And the fact that it was situated in a somewhat secluded suburb mainly consisting of the university just added to that impression. The house where I stayed belonged to a fraternity, which is a kind of social organization for male students. There were about 30 people staying in the house during the summer, both members of the fraternity and interns working in the surrounding areas such as myself. Needless to say, there was rarely a dull moment and I got to meet lots of people from different backgrounds, all of whom wanted to show me their idea of what America is all about.

To sum it all up, this summer has been great in many ways. The challenging tasks I was given has taught me a lot about applied mathematics, something that I will benefit from when continuing my studies at Chalmers and in my future professional life. I would like to take the opportunity to thank everyone at NVI, and my supervisor Karine Le Bail in particular, for making this internship possible.



# Exploring the Power of Photons in Sunny Fort Collins

Text & photos: Martin Lars Svante Johansson



At the top of the Grey Rock Trail Mountain

**I arrived in Denver late one night in June after an intense and fun week in New York with the rest of the CETAC members, took a deep breath of one-mile high thin air and headed towards the small town of Fort Collins, not knowing what to expect. I was about to learn two things, this well-hidden gem in Colorado is easy to find and very difficult to leave and "When there is a huge solar energy spill, it's just called 'a nice day.'"**

Fort Collins is located 57 miles north of the Colorado state capital in Denver and is a large college town, home to Colorado State University (CSU) and offers the convenience of a small town with all the amenities of a larger city. It was named Money magazine's Best Place to Live in 2006 and #2 in 2008. It's also a gateway city to northern Colorado's Rocky Mountain National Park and Roosevelt National Forest.

Abound had organized housing for me in the CSU dorms, which turned out to be the perfect place for a Swedish physicist, a long way from home, to make new friends. My new-found friends consisted of media summer students from the

United Kingdom, an agricultural student from New York and psychology interns from all parts of the US. I have them to thank for making my life outside of the office the best summer of my life.

With the help of Abound I quickly adapted to this new American lifestyle, and was soon really starting to enjoy driving the automatic transmission car that the company had provided for me, giving my other hand time to hold on to my Starbucks cup of coffee or my large submarine sandwich.

Abound Solar is a leading manufacturer of next-generation solar modules and spun out from 15 years of research and development conducted at Colorado State University, where a new continuous manufacturing process to manufacture low-cost cadmium telluride thin-film photovoltaic solar modules had been discovered. Using Cadmium Telluride (CdTe) in this innovative process as the primary photovoltaic layer turned out to be the ideal solar photovoltaic technology.

Abound has a very promising and bright future which became apparent during my stay as President Barack Obama announced that the company will receive a \$400 million loan to expand its solar module manufacturing capabilities in the existing facility in Colorado and to begin



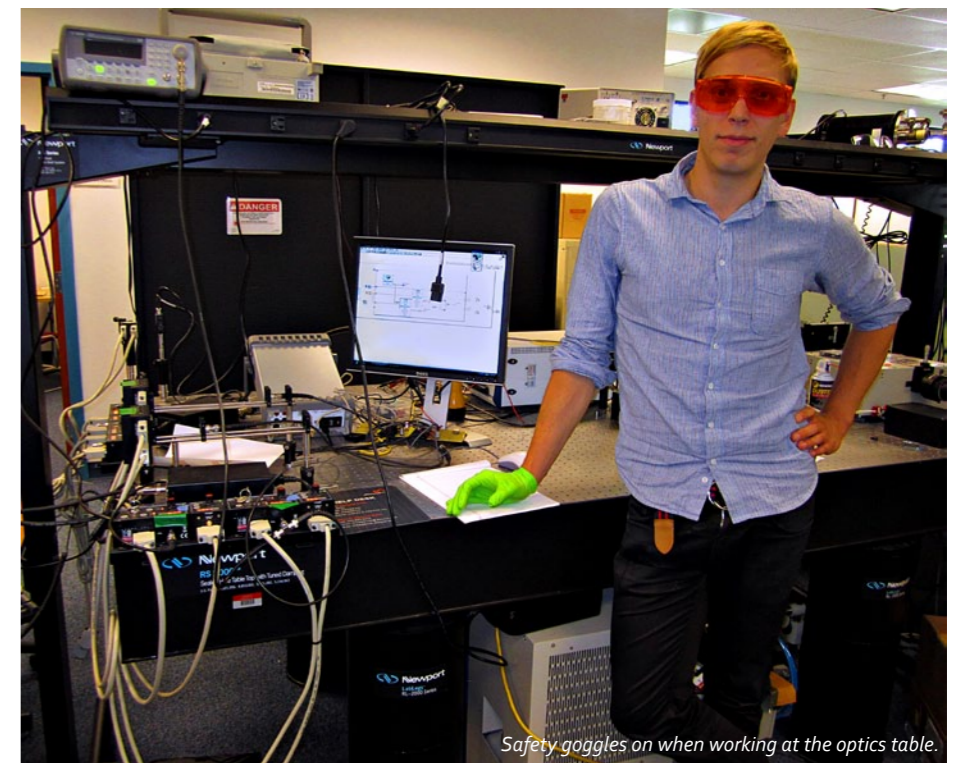
the construction of a second production facility in Tipton, Indiana. When both plants are complete, Abound Solar will be able to produce more than 840 megawatts of solar modules annually.

During my time in the research and development department at Abound Solar I had the opportunity to try out a variety of different tasks that occur in the solar cell industry. As I am tremendously

interested in environmental physics, this turned out to be a great introduction to the field of green technology where my background in engineering physics, especially solid state physics, was really needed and put to the test. In order to maintain a competitive advantage in the thin-film photovoltaic industry, Abound wants to be ahead of the curve on next-generation device designs. So one of my major projects during the summer was to develop a software model to roughly predict performance based on proposed device design changes. My main task was to simulate different ways of creating a conduction-band energy barrier, a so-called electron reflector, which then can reduce the recombination due to the electron flow to the back surface and thus improve the efficiency of the CdTe thin-film solar cells. I also got to



Enjoying some late night 'finger lickin' good' BBQ wings and seller sticks



Safety goggles on when working at the optics table.

make thickness measurements and try a variety of typical solar cell characterization methods such as current-voltage characteristics (J-V), quantum efficiency, capacitance voltage profiling and profilometry.

As Fort Collins has plenty to offer on its own, I also had a busy schedule outside of the office every day throughout the summer. Together with my friends from the dorm an evening could consist of activities such as bouldering rock climbing, lounging at the movie theater watching free cartoons and eating unlimited cereal, or playing a game of pool and enjoying a local draft beer while considering how fortunate I was to be sipping beer at the nexus of the craft beer universe.

Most weekends were spent exploring the stunning natural landscape that is just minutes away from Fort Collins. For example taking a drive up the many meandering miles of Trail Ridge Road in Rocky Mountain National Park, paying a visit to the historic Stanley Hotel which served as the setting for Stephen King's The Shining at the beginning of the route. On the Trail Ridge Road we could catch views of glacier-carved valleys, daunting peak summits and distant crystalline lakes reflecting the setting sun at an altitude of over 12,000ft!

We also made trips to the state capital of Denver. Some highlights were

the 10th annual Underground Music Showcase, one of the largest indie music festivals in the western United States, and the Summer Brew Fest where you could have a taste from one of more than 100 craft brewers that exist in Colorado.

Many hikes were made throughout the summer. A particularly memorable one was one sunny Sunday afternoon when one of my newfound friends from Swansea and I grabbed our hiking boots and headed out to the Grey Rock trail situated in the "wild and scenic" Cache la Poudre River canyon, with no idea what we were up against. We had to pay close attention to the rock cairns (man-made stacks of rock), because it was easier than we realized to get lost and we ended up missing a couple of switchbacks and followed paths that must have been worn by mule deer. Apparently each year an average of two grey rock trail hikers return to their car with the help of search and rescue. Of course we forgot to take water with us on this scorching day, and after many hours of intense high altitude hiking and an elevation incline of over 2000ft we were relieved to reach the top of the rock and to feast on views that would blow your mind!

Finally, I would like to thank the brilliant minds at the R&D department, especially Mr. Alan Davies, and the people at the HR department for making this fantastic summer possible for me.

## Martin Lars Svante Johansson

Age: 23

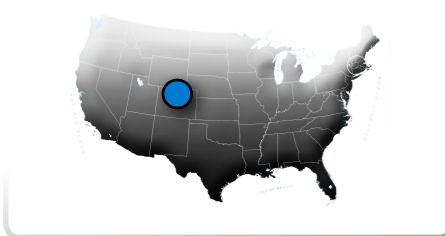
Company: Abound Solar Inc.

Location: Fort Collins, Colorado

Tasks: Modelling and measuring solar panels.

Bachelor: Engineering Physics

Best US experience: Discovering Colorado's emerald green forests, fields of vibrant wildflowers, picturesque mountain lakes, abundant grasslands and rich red rock formations.





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# Cornell University - Ithaca, NY

Text & photos: Oscar Petersson

After a long day of transportation I finally arrived in the middle of the night to the little city I was going to spend the following weeks.

I had found a guy from whom I was going to rent a room and yes, he was there, outside the house waiting to give me my keys. I was very tired at that point and my only goal was to get as much sleep as I could before I had to get up for the first meeting with my boss, professor Shealy, but I did not get very good sleep that night. It turned out to be freezing cold in my room, even though I tried to cover me whatever I had. Cover and pillow was the first two things I really needed to buy.



On top of the Empire State Building

The apartment had three bedrooms, a living room and a kitchen. The washer and dryer were placed in the cellar, which was quite scary to go to the first time. The entrance door was located outside the house and behind it was a wooden staircase, cobwebs and dripping water included. Except from me, there were two other guys as well in the apartment, one local and one from the east coast. One of them had a car which turned out to be very useful, especially when we went to buy the weekly groceries at 12.30 am.

Ithaca is a beautiful town. It is quite small and has a lot of vegetation, much more trees and lawns than I expected. But the most beautiful part was actually the campus itself. The first you will notice is that there are a lot of buildings that look almost as they were taken from a movie or something, an old but nice look. Together with large open fields of grass, a small lake and a waterfall it was a really nice campus, overlooking downtown Ithaca. The overlooking view is due to the campus being on a hill, which I was

**Oscar Petersson**  
Age: 23  
Employer: Cornell University  
Task: Determining breakdown voltages.  
Location: Ithaca, New York  
Bachelor: Engineering Physics  
Best US experience: New York weekend.

reminded of every day I went to work. Of course, there are some modern looking buildings as well, for example the one I worked in.

Already the first day in Ithaca, I met professor Shealy. He is a professor at the Electrical and Computer Engineering department at Cornell University. I looked forward to the first meeting since I did not know really what I was going to do or what kind of expectations they had about my work. He gave me an insight of what the work was going to be and it sounded like it could be very interesting. The problem he had was that there was not really a way of doing high voltage measuring of a type of semiconductors called high electron mobility transistors, in our case Gallium Nitride. Together with another student from Cornell, we were given the task to figure out a measurement setup and call companies to get appropriate equipment. One problem that had to be solved was to make sure there is no unwanted breakdown during measurement. The second part of the assignment was to find a way to measure the characteristics that we wanted. The best thing would be to determine the breakdown voltage without actually breaking the device.

The short time goal with this assignment



My co-worker and I after a game of tennis.

*"The best thing would be to determine the breakdown voltage without actually breaking the device."*

was to measure the breakdown of some transistors that one of professor Shealy's graduate students build. In the end, the work for my part was mostly to search and read articles about breakdown in different materials and substances, different methods of high voltage measuring and contact companies around the world in order to get the measurement equipment we needed. Unfortunately, these things took too long time, and I ended up not having time to do any of the actual measurements.

Besides working, I did a few things. The first day I was introduced to the very nice little College Town Bagels, a small lunch/coffee shop during daytime which turns into a relaxing pub in the evening and night. There were always a lot of people and in the evening there was live music in some form. After a long day at work it was quite hard to not stop by on the way back home.

A couple of times I played tennis with some friends on the tennis fields at campus. One day, after almost 3 hours of play we realized that there was an outdoor concert at one of the big lawn in the campus area, some kind of jazz or blues. A lot of people were sitting in the grass and some were dancing. First I was surprised that a lot of people were dancing but a friend of mine told me that most of them were part of a dancing class, including himself. I was more enjoyed with kicking some soccer with some random people under blue sky during sunset. This was probably the best evening I had in Ithaca.

The best thing about the whole U.S trip was the weekend I spent with my family in New York City. It is quite easy and cheap to take the bus, which takes about five hours from campus to downtown New York. The trip was nice because it was the first time I had been there and

the city surprised me in a positive way. In addition, the weather was perfect. Ithaca is nothing like it, and that was quite nice as well. After four days in the city, it was nice to get back to the less hectic and smaller town.

That was everything I had to share this time about my trip to the U.S. and my time in Ithaca. I want to thank professor Shealy for giving me the opportunity to go to the U.S. , working for him and gain experience about working abroad. I would also like to thank everyone else that in some way has helped me making this trip possible.



Photo: Martin Ohlsson



Photo: Johan Borglin





## An Unforgettable Experience

Text & photos: Martin Ohlsson

**It is 5am in the morning an early spring morning and I set off to school to sign up for CETAC 2010. At this point I was not really sure of what I got in to, but today, about one and a half year later I know that this was one of, if not the best thing I have ever done in my life.**

Let us jump to June 4th 2010. Erik, Anders, Emil and I set off to New York and an experience that never will be forgotten. We were all excited of finally being able to fly to America and do our internships after one year's hard work. After three days in the Apple we got accompanied by the rest of our friends from CETAC. After another five days it was time to say goodbye to everyone and I flew to this sauna called Raleigh in North Carolina where I was about to spend the upcoming 3 months working at ABB. When I arrived at Raleigh airport I faced 39degrees Celsius, which I later found

out was not just a temporary heat wave. Anyway, I had sorted housing at the NC State University in a dorm, shared with three Americans. This was just a temporary housing and I still had not figured out where I would live the last month of my stay, but thankfully this guy from work offered me to stay with him the last month and also being allowed to use his Ford Mustang as much as I wanted (Hell yeah!). Not having a car in this city is equal to either not being able to get around or being a regular with the local taxi company. My supervisor and the secretary had told me before I left Sweden that they really recommended that I should get some kind of car during my stay, I kept telling them that public transport could not be that bad so I never rented or bought one. After my arrival I came to the conclusion that they were right, there is hardly anything called public transportation, and when you finally found some kind of transportation it did not even go to the place you wanted. So the Mustang came in handy so to speak.

The day after I came to Raleigh it was time to start doing what I came here to do, the internship at ABB. This company is known by most Swedes and it is the result of a merge between the Swedish company Asea and the Swiss company

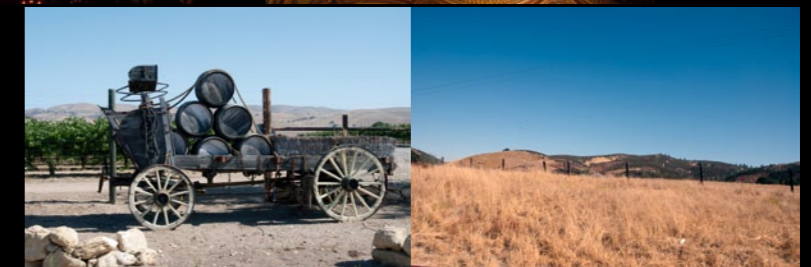
### Martin Ohlsson

**Age:** 22  
**Company:** ABB  
**Employees:** 120 000  
**Location:** Raleigh, North Carolina  
**Bachelor:** Software Engineering  
**Best US experience:** A week in New York and Miami Beach



*"...nothing beats the beaches..."*

*"...there is hardly anything called public transportation..."*



Brown Boveri in 1988. Today ABB has over 100 000 employees and a yearly turnover of 30 billion US dollars. I was going to work in a subsidiary called Power Systems Substations. Here they plan, design and construct power substations. And now you might think what I would do there with a software engineering degree and I will get to that later.

On my first day I got up early in the morning to get ready in good time before work. After a good 20min walk I got to work and met up with the assistant who showed me around the office and pointed out my cubical where I would spend my upcoming three months creating something that at that point still was pretty vague to me, all I knew was that they had this massive spreadsheet that needed to be converted into something that was more user friendly and expandable. After a nice lunch with my supervisors the things that they wanted to get out of this internship and what I had to

do, got clear. I more or less started working on my project at this point and in the end I just managed to finish within schedule. During my time at ABB all the people in my office were very friendly towards me and were always keen on helping me out if I had any problems.

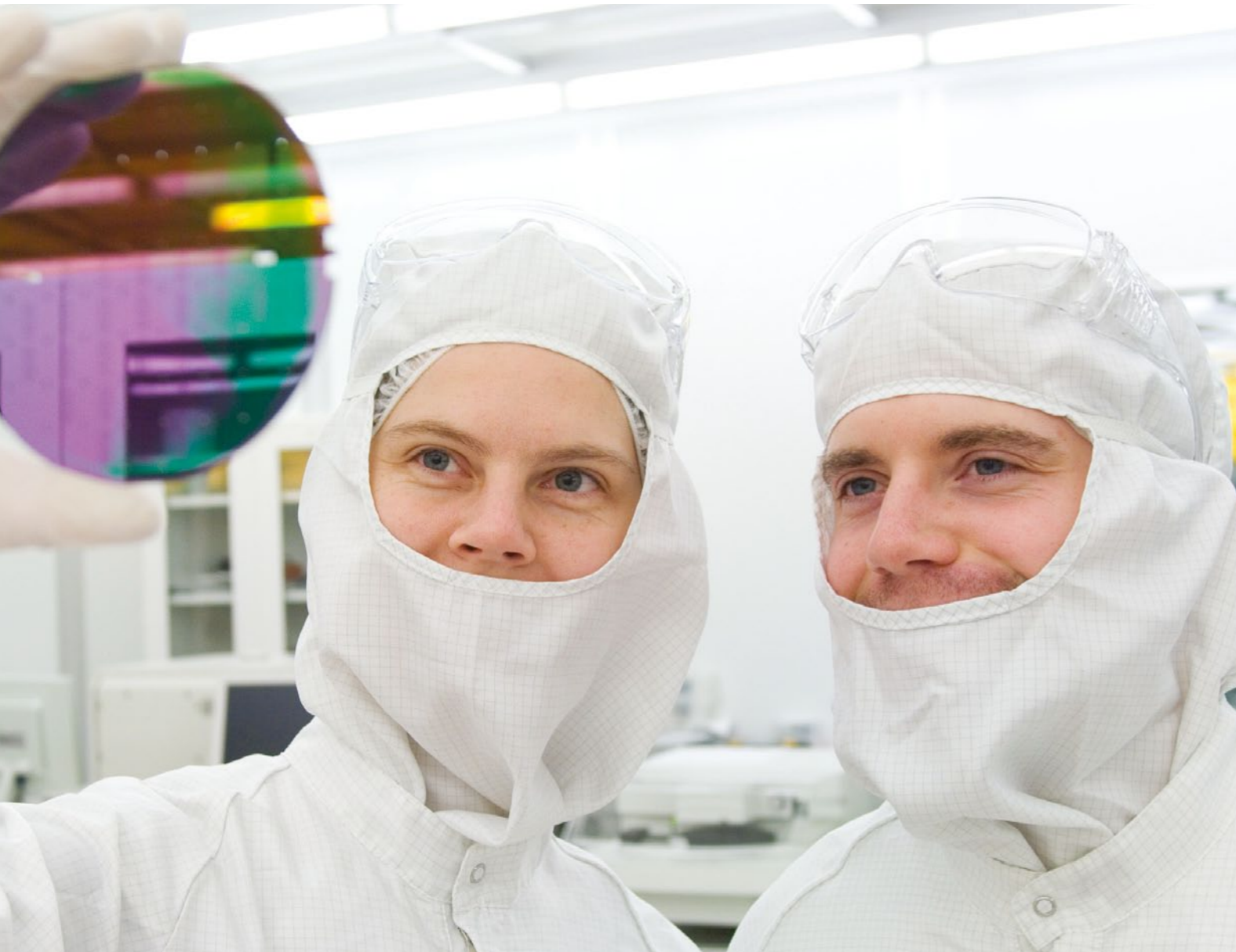
During my stay in USA I took the time to travel around quite a bit. First off I traveled to Washington D.C. to see Erik Nilsson and have some fun. While in D.C. I think we might have experienced one of the coolest "cop" scenes ever, but not on television. Erik and I had just been out the whole day walking around in D.C. so we decided to sit down and relax on a bench next to a subway station. After a couple of minutes we saw some squad cars further down the road, but in the big cities you see that all the time so we did not think much about it. But just a couple of seconds later we heard someone screaming –"GET DOWN ON THE GROUND!" and we saw this guy sprint-

ing past us and around the corner. A cop ran after with his gun drawn towards him. Before either me or Erik had understood what was going on, about ten more squad cars arrived at the scene. One cop fell as he started to run, mainly because he probably had eaten too many doughnuts during his time in the force but the whole scene that was happening around us was just too good to be true. Now enough about that. At the end of the summer I also went to Miami Beach together with Erik and it was one of the best places I have ever been to. Nothing beats the beaches and at nighttime you do not get disappointed that is for sure.

Before I leave USA I have a trip to Vegas and California on my list. Finally, I just want to say thanks to all people at ABB that made my summer so good. Also thanks to all companies that have contributed to CETAC, without all these this experience would not have been possible.



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# Reflections from a Kick Start and Team Building Trip to Stockholm

Text: Mikael Doverhag Photos: CETAC 2010

In September of 2009 it was once again time for a new group of Chalmers students to start their journeys towards Internships in the United States. After a lot of time spent recruiting members and getting the newly formed association called CETAC 2010 official. This ship was finally taking off. It was once again time for CETAC's annual kick-start-trip to Stockholm.



had done for members of our Alumni-community, and how it had helped them in their future careers was truly inspiring. A pretty exotic work-environment seems to be reality for most members of CETAC Alumni.

Last and third day was Saturday and was thereby free for everyone to explore the Stockholm-area. This also gave me the opportunity to speak

It was around 5.30am as all members of CETAC 2010 were gathering at the Gothenburg train-station. Stacked up on Trainee Reports and a whole lot of expectations, we were heading off to Stockholm. The city where a majority of Swedish Tech-companies have their headquarters to find the ones that are interested cooperating with our association.

mainly involved contacting companies exploring their possible cooperation with CETAC and trying to set up meetings to be held during the Stockholm trip.

As we arrived in Stockholm, everyone headed out to their respective area to start working. For board-members this was first about setting up camp and checking in at Bredängs Camping where we lived during our stay. From here we moved into the city to set up call-center mid-Stockholm on various cafes to be able to answer possibly upcoming questions from members. At the time, the recession was just considered to be over, but we were still fairly worried that companies would be holding back on buying advertisements. After a couple of hours the first couple of calls seemed to be coming in where companies was interested in full-page ads and even the back-cover of the Trainee Report. These calls both being somewhat of a relief as well as the best part of the day, we headed back to camp to enjoy an American barbecue at the camp. Despite the bad weather some members decided to head out to town, but most stayed at the camp.

with many members. I remember being amazed about how any CETAC member is eager to talk about the future, what they want to achieve and work with. Many members wanted to discuss how we could better market the community and how to adjust our different alterna-



tives for selling ads in the Trainee Report. This was really invaluable for me as a Treasurer to perform my work during the year. I also remember being intrigued by all of a sudden being surrounded only by people who made a big deal of achieving their goals and my general description of a CETAC-member after this trip would be a perfect blend of academic and entrepreneur.

When it comes to results. Some had a very successful trip, selling the back-cover of the Trainee Report where some had it a bit more difficult. Looking back, it was the perfect opportunity to make new friends and contacts as well as the start of working with something as a group eventually leading to qualified internships in another part of the world.



As the second day was looking very similar to the first, it was going to end a bit earlier with eating pizza out, followed by a visit to the Camping Sauna. From here we headed out to meet up with CETAC Alumni in town. At least I had a very good time and I think I am speaking for most members when I say that hearing what the time in CETAC



# cetac Alumni

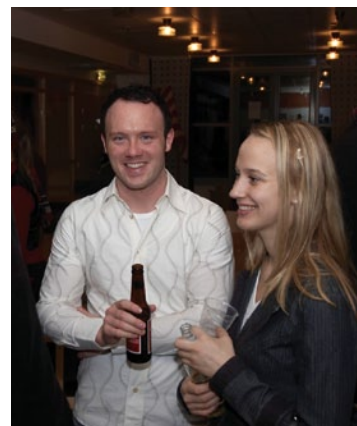
CHALMERS ENGINEERING TRAINEE APPOINTMENT COMMITTEE

CETAC Alumni all have a couple of things in common. Not only do we have (or will soon have) a degree from one of the best technical universities in northern Europe. We also had to spend a year fighting for something that we really wanted. Even more importantly, we have all practiced our engineering skills during a couple of months in a foreign country. I believe that these are things that make us extremely capable to solve future problems. I also believe that when great people come together, great things happen, and this is why CETAC Alumni exists.

CETAC Alumni was first started in 2006 and it is with great pride that I now continue this legacy with help of the CETAC Alumni board. We have now over 100 members and we are growing steadily every year. Our activities vary from arranging dinners to sending out newsletters to helping CETAC attract new students.

Together, we are helping CETAC grow while at the same time growing ourselves. CETAC Alumni is a place to share memories, meet friends and discover new opportunities. Joining CETAC is not only a great chance to do an internship in the United States, but it is also a chance to join CETAC Alumni.

Best Regards  
Tomas Gille, chairman of CETAC Alumni



Photos from the CETAC 40th Anniversary Party which was arranged by CETAC Alumni.



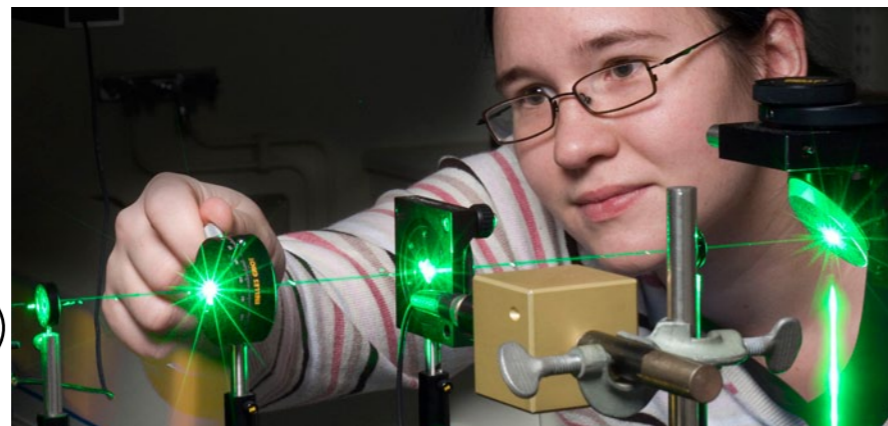
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# The Chairman Speaks

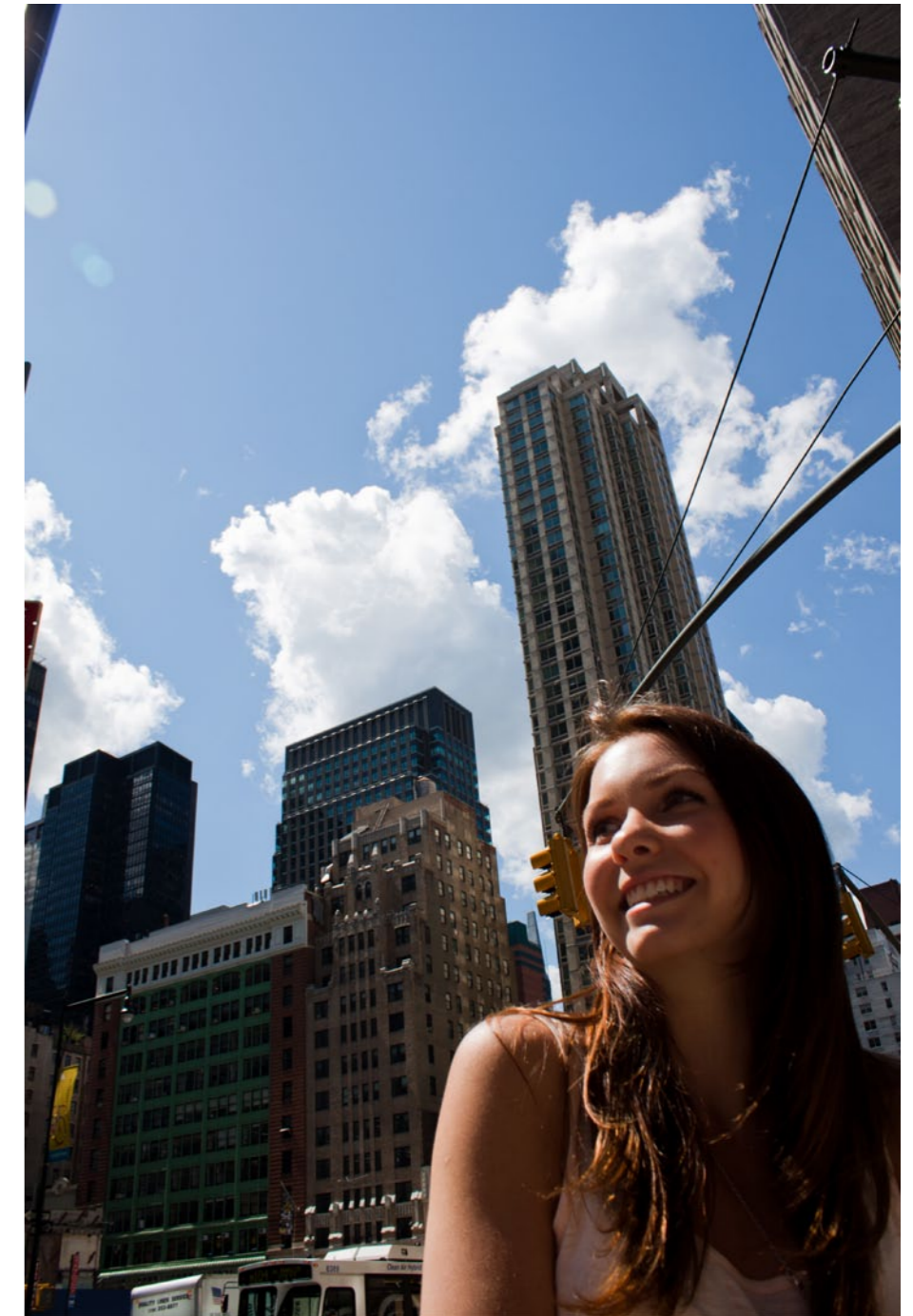
Text: Annelie Forslund

We were 12 people leaving Sweden in the beginning of June 2010, seven of them are still in the states while this is written. We have been working and earning money, both of them being great things for a student. But we have also done one other thing which is far more important than the things listed above; we have gotten an experience of a life time!

This experience started as early as one and a half year ago when CETAC 2010 was formed and the work towards an internship in the states began. There have been many hours of work put into this organization to be able to achieve what we have done. And now looking back at it, it has been worth it all!

Being CETAC 2010's chairman has meant a great deal for me and it has developed me in so many ways. I am very thankful for every experience I have had trough this organization and I am excited about how good our work turned out. After working with CETAC I really see its greatness and how life changing it has been for many people who have been a part of it. No matter if you are working in the board or if you work with selling advertisements to the TraineeReport you will gain a lot of experience from being a member. Asking our members after a year with CETAC they really think that CETAC is a great organization and that they have learned a lot about themselves and about working as a sellers. Experiences of selling is of huge importance in your future career and I am happy to have been able to see the progress in our members in regards to their selling technique and their confidence to believe in themselves.

Not only are you developing yourself and gain lots of experience when being a part of CETAC, you also open up doors and opportunities that otherwise would be hard to reach. Working in the states give you amazing opportunities to network and focus on your career. You nev-



er know what people you are going to meet. Some people might be new dear friends and some people might offer you your first job. The opportunities are tremendous and only you decide whether to take them or not!

I am very proud of CETAC 2010 and what we have accomplished. I would like to thank you all for all the time and energy you have contribute with, you have really made this happen!

**Annelie Forslund,**  
 Chairman



# Thank You!

For fantastic support and essential contributions to making our project possible, CETAC 2010 would like to direct our sincerest gratitude to all of the following:

## Trainee Hosts

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President of Chalmers  
Advisor to the President of Chalmers  
Professor  
Coordinator of exchange programs  
Department of Mechanical Engineering

The logo for CETAC, consisting of the letters 'c', 'e', 't', 'a', and 'c' in a stylized, lowercase, rounded font. The letters are white with a slight shadow effect, making them stand out against the colorful floral background.

CHALMERS ENGINEERING TRAINEE  
APPOINTMENT COMMITTEE



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# ELEKTRA-programmet stödjer elkraftteknisk forskning

ABB, Elforsk (elföretagens gemensamma forskningsbolag), Banverket och Energimyndigheten driver gemensamt ett elkrafttekniskt forskningsprogram benämnt ELEKTRA. Bakom Elforsk står de elkraftproducerande och elnätdrivande företagen i Sverige, som Vattenfall, E.ON, Fortum, Svenska Kraftnät, Göteborg Energi mfl.

ELEKTRA omfattar forskningsprojekt inom traditionell elkraftteknik såsom forskningsprojekt inom elkrafttekniska material och elmotordrifter, men även inom nya områden med tillämpning av ny kunskap från andra områden, till exempel informationsteknologi, bioteknologi, rymdvetenskaper, komplexa system mm.

ELEKTRA som startades 1993 och har oktober 2009 resulterat i 167 examina, varav 67 doktorsexamina och 100 licentiatexamina



ELEKTRA finansierar för närvarande ca 30 forskarstuderande på ett antal institutioner på Chalmers Tekniska Högskola, Kungliga Tekniska Högskolan, Lunds Tekniska Högskola, Luleå Tekniska Universitet och Uppsala Universitet. Avsikten med ELEKTRA är att långsiktigt stärka konkurrenskraften hos elföretag och tillverkande industri, och samverkan mellan industri och forskarstuderande stimuleras.

## **Elkraftteknologer som ska göra exjobb utomlands! Sök stipendiet!**

ELEKTRA beviljar också stipendier för elkraftteknologer för att täcka de merkostnader som uppstår vid examensarbete som genomförs utomlands, speciellt inom det elkrafttekniska området.

- Kolla på nätet: <http://www.elforsk.se/distribut/dist-hogskole.html>

Här finns mer information om stipendierna.

Det kommer att behövas fler forskarutbildade inom elbranschen och elkraftindustrin!

Funderar du på att börja forska, ta kontakt med din elkraftinstitution.



Energimyndigheten

**ABB**



**BANVERKET ELFORSK**