INTERNSHIP REPORT 2018

53rd ANNUAL ISSUE

CHALMERS ENGINEERING TRAINEE APPOINTMENT COMMITTEE

Bli medlem i CETAC

CETAC är en ideell förening vars syfte är att ordna praktikplatser i USA och Kanada för teknologer från E, D, IT, F och TM oavsett ekonomisk bakgrund. Vi kan stoltsera med tidigare arbetsgivare som till exempel NASA, Tibco Spotfire, Bracket, Apple, Intel, Microsoft, VMware, Ericsson och SUN Microsystems. Pratiktikplatserna varierar från en sommar till ett helt år. Vissa blir till och med kvar i Nordamerika eller åker tillbaka dit igen efter de har tagit sin examen! CETAC lägger också stor vikt vid att praktikplatserna är intressanta och kvalificerade ingenjörsarbeten för varje enskild medlem.

Praktiken ger inte bara goda arbetslivserfarenheter men också ett värdefullt kulturellt utbyte. Kulturell förståelse och erfarenhet är något som efterfrågas allt mer i det globaliserade näringslivet. Förbättrade språkkunskaper i engelska är också jätteviktigt då ingenjörers kommunikativa förmåga är av stort värde för företag idag men också att för att företag har engelska som koncernspråk. För att bli medlem i CETAC skall du studera på E, D, IT, F eller TM 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. Vill du söka en praktikplats till sommaren 2020 så är ansökningstillfället för detta våren 2019. Som medlem är man aktiv knappt ett år innan avresa och får chansen att lära känna teknologer från andra sektioner. Missa inte chansen att uppleva ett spännande och lärorikt äventyr!

Om du har några frågor, tveka inte skriva till oss på info@cetac.se eller läsa mer på www.cetac.se

Läser du inte på något av de program som ingår i CETAC? Kolla in vår systerförening AMCIP på www.amcip.se.

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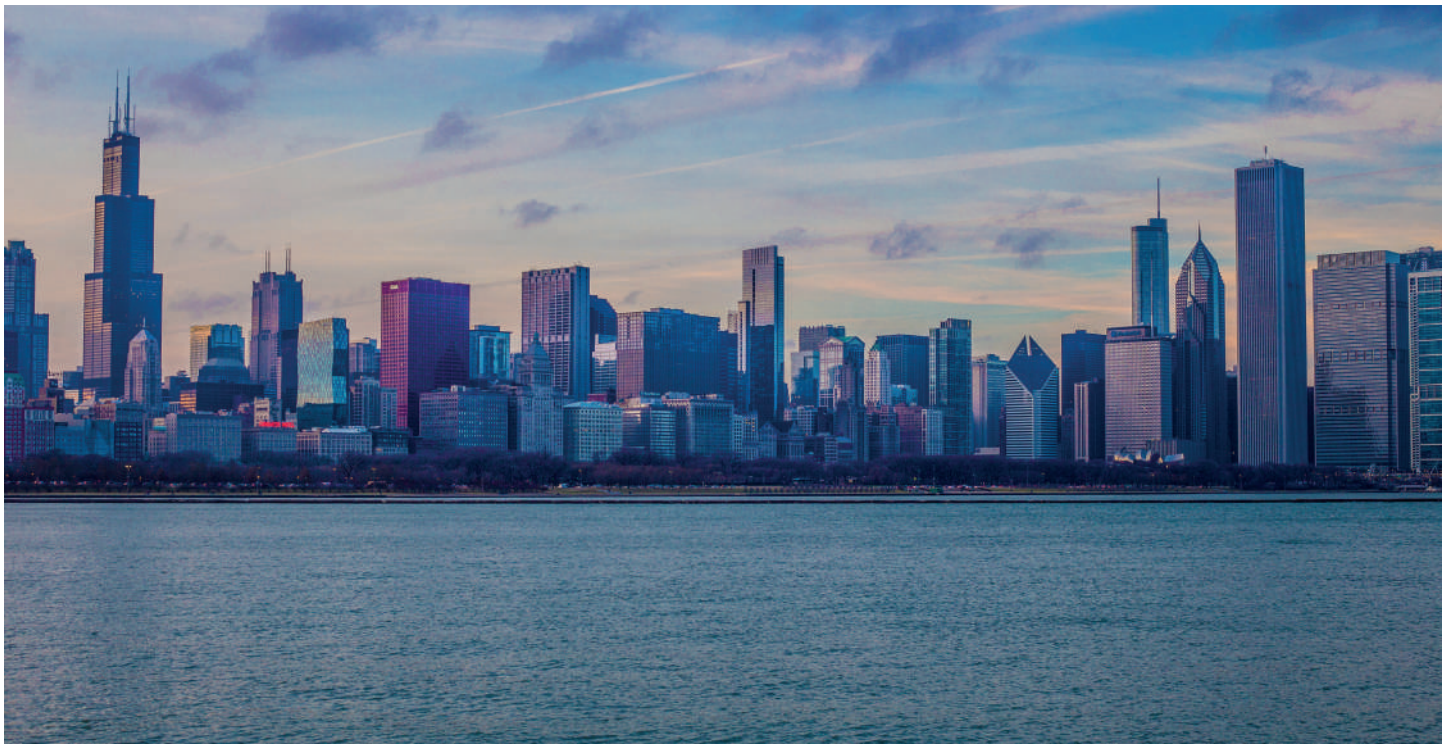

Editor's note

As Editor for CETAC 2018, this is text is my final contribution. When I applied to CETAC, almost two years ago, I had no idea how much it would impact my future. I am sure all our interns, both the ones that are still across the Atlantic and the ones that have gotten home, feel the same way.

This magazine, which is the 53rd edition of Trainee Report, tells stories from all across North America of adventurous students from Chalmers. Everyone experiencing something completely new, and very different from life in school. In addition to all the real-life work experience gained, new lifelong friendships are formed. North America truly is the land of opportunity.

CETAC continues its legacy into 2019 and with some luck and determination, next year we might be reading about your big adventure!

Marcus Linderholm
Editor in Chief
CETAC 2018

Editor in Chief
Marcus Linnerholm

Editor
Henrik Berggren

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Chalmers Engineering Trainee Appointment Commitee

Founded in 1966

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Cover photo : Robert Bye
Printed by : Erlanders tryckeri
Nr of copies : 750

Stefan Bengtsson

President and CEO

Chalmers University of Technology

CHALMERS' INTERNATIONAL OUTREACH

Our vision - Chalmers for a sustainable future - permeates everything we do. It requires us to be connected and engaged, both locally and globally. It makes international networking and collaboration key priorities in education, research and innovation.

Chalmers alumni have careers in diverse and internationally connected companies and organizations. Hence, developing and supporting activities that provide Chalmers students with international experience, as an integrated part of their education, is essential.

CETAC is a student led organization, that supports Chalmers students in their quest to find companies in the US and Canada offering internships. Its committee is dependent on your support to ensure the continued success of the program. CETAC plays an important role in providing opportunities for international experience to Chalmers students and I fully support the program.

Stefan Bengtsson
President and CEO
Chalmers University of Technology

Visst är det knepigt att tänka på alla detaljer? Ännu knepigare är det att sätta ihop dem till en lösning.

Bli en duktig problemlösare, sök Teknisk fysik på Chalmers.

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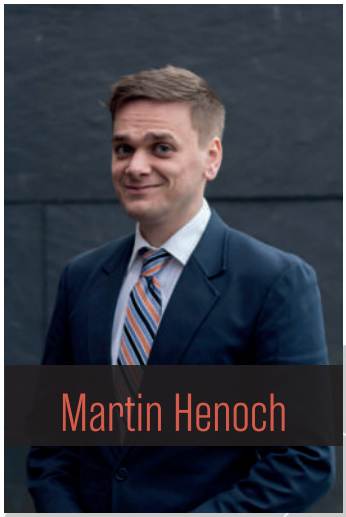
Interns in North

Tilda Sikström



Martin Henoch

NVI, Greenbelt MD

LBNL, Berkeley CA

Frida Brogren

Anton Mattsson

Marcus Linderholm

Renée Gyllensvaan

Bison, Boston MA

America 2018

William Hjelm

Rema Tip Top, Northvale NJ

Amerden, St Augustin FL

Gustav Karlsson

Marcus Forsberg

Niklas Forsström

CETAC 2018 IN NEW YORK

BEFORE HEADING OF TO OUR internship destination, some of us made sure to keep the tradition of paying New York City a visit. It is a challenge to see as much as possible of the city in just a few days time while slightly jetlagged. I must say we did pretty well!

We landed on a Thursday evening at JFK, made it through customs and then headed straight to our hotel in the Lower East Side of Manhattan. From there it was easy to get around in NYC.

Come Friday morning, when jet lag really hits you. Since lying awake in bed at 5 am is no fun, Niklas and Frida went out for a morning jog in Central Park while Marcus and Gustav explored the park in a slower pace. During their walk they stumbled on a crowd listening to "good morning America", a music event that New York offers every once in a while. Considering the time of the day, this was really interesting to see.

Once the visit in Central Park was over we bought some breakfast, the clock was still only around 7, and began to walk along 7th Avenue to eventually reach Times Square, which was a first for all of us. The morning passed quickly, due to the long walking distances, and soon it was time to meet up with Tilda and Tatiana at ASF.

When in the city we make sure to have a meeting with our visa sponsor, the American Scandinavian Foundation. Tatiana Pashman has been a great help and answered all the questions we had during our visa process. She goes above and beyond to help us. Tilda was staying with her old host family about two hours outside of NYC. Tatiana, also living in New Jersey, took an hour long detour to pick Tilda up before the meeting with the rest at the Scandinavian house. After our meeting they made sure to get us a typical american lunch, burgers at Shake Shack!

For the rest of the weekend, we explored

New York City with everything that that entails. Central station, Rockefeller center, the 9/11 memorial, Chinatown, Statue of Liberty and the national history museum are just some of the things we made sure to visit.

The weekend passed quickly, and soon it was time to head on to our internships. Frida had a cross country flight to get over to California. Marcus, Gustav and Niklas had their flight heading south to Florida. Tilda got to drive a pick up truck down to Washington D.C. All of us were filled with new impressions and excited to start the next adventure.

Tilda Sikström

Lasers in Berkeley

The epicentum of the hippie culture, mecca of the (American) gay community and lately the perfect seebed for tech-companies. There is the Italian district, China town, French quarters and taquerias everywhere! Poke-bowls, sushi rolls, bagels and burgers. The San Francisco Bay feels somewhat schizophrenic. There are people selling tie-dye shirts in the shadow of 100-meter-high multi-million dollar skyscrapers. People complaining about gentrification but also very much enjoy that pay check they get from one of the start-ups in the shiny buildings. I guess it's true that a city can't be famous for its alternative lifestyle and eccentric vibe without already becoming mainstream. But so is Facebook and everybody wants to be there anyway.

So the place I am living in is called Berkeley and is located 15-20 miles outside San Francisco right across the San Francisco Bay. The vibe of the city is very studentesque: coffee shops, book shops, sororities and the thick smell of weed everywhere you go. Not entirely clear if this is a scene from an American Pie movie or if the two personas: student and hippie-hobo is very closely related.

But California is much more than legalized pot and gentrifying tech-companies. While I've been here I've got to see some extraordinary scenery and meet wonderful people from all over the world. This is truly a place for adventures, the list of things you can do here never seems to end. Whether you are interested in hiking, climbing, sailing, paddling, surfing, biking, or more into socializing, tourism, eating, drinking, partying, art, music there is always something to do and almost always someone to do it with if your open minded and have the money and time to spend on public transport or an Uber. I realize that I'm starting to sound like an advertiser and I'm going to take it down a notch.

Of course, everything isn't a walk in the Golden Gate park. There have been days when I really have been longing home to family and friends,

tiered of meeting new people and always explaining who I am and what I do. These times I usually end up baking cinnamon rolls or watching Pistvakt (semi-obscure Swedish TV-show). But it's okay, my room mates really appreciate these times.

I fill my free time with a lot of hiking, biking and trail running. There is a lot of trail runners in the area and by using different event apps it's easy to coordinate a run together. The nature here is astonishing, from the long sandy beaches to cliffs with a fall of 100 meters down to the water and in towards the country there is eucalyptus and redwood forests mixed with open fields with burned out yellow grass. More than once I've pretended that I'm one of the characters in Westworld (minus all the killing and sexual abuse).

One way to meet new people is to attend one of the many pot-luck parties in the area (it was on one of these occasions I drank from a red cup for the first time - life changing experience). People come together and play their versions of kubb. I feel that it has been easy to find new friends and people to hang out with. This was one thing that worried me a lot before I came here but people are very friendly and if you just show some interest, they will happily bring you along.

The Mexican influence is strong in the bay area. You can notice this on people choices of food. If you ask someone which favourite drink they have they will probably answer something tequila based. Sun-warm and incredibly strong margaritas (it's like they don't even try to cover the tequila flavour) are also what is most commonly served on the potlucks. People favourite food is more than often Mexican. When people are drunk they don't go to burger king they go to taco bell (which for the record is equally disgusting and greasy as burger king and therefore goes perfect as 3am snack). As a Nordic citizen who never order anything with more than zero chilis on any restaurant the combination beans, onion, cheese and spice is... not so great. The first time I ate Mexican I didn't eat anything else for the three proceeding days. Why the Mexican-diet isn't a thing remains a mystery but if you want to survive eating out, I would recommend always carrying around a yoghurt to mix up everything with.

So maybe I should tell you about the very reason I'm here: namely my work at Lawrence Berkeley National Laboratory (LBNL). For the past

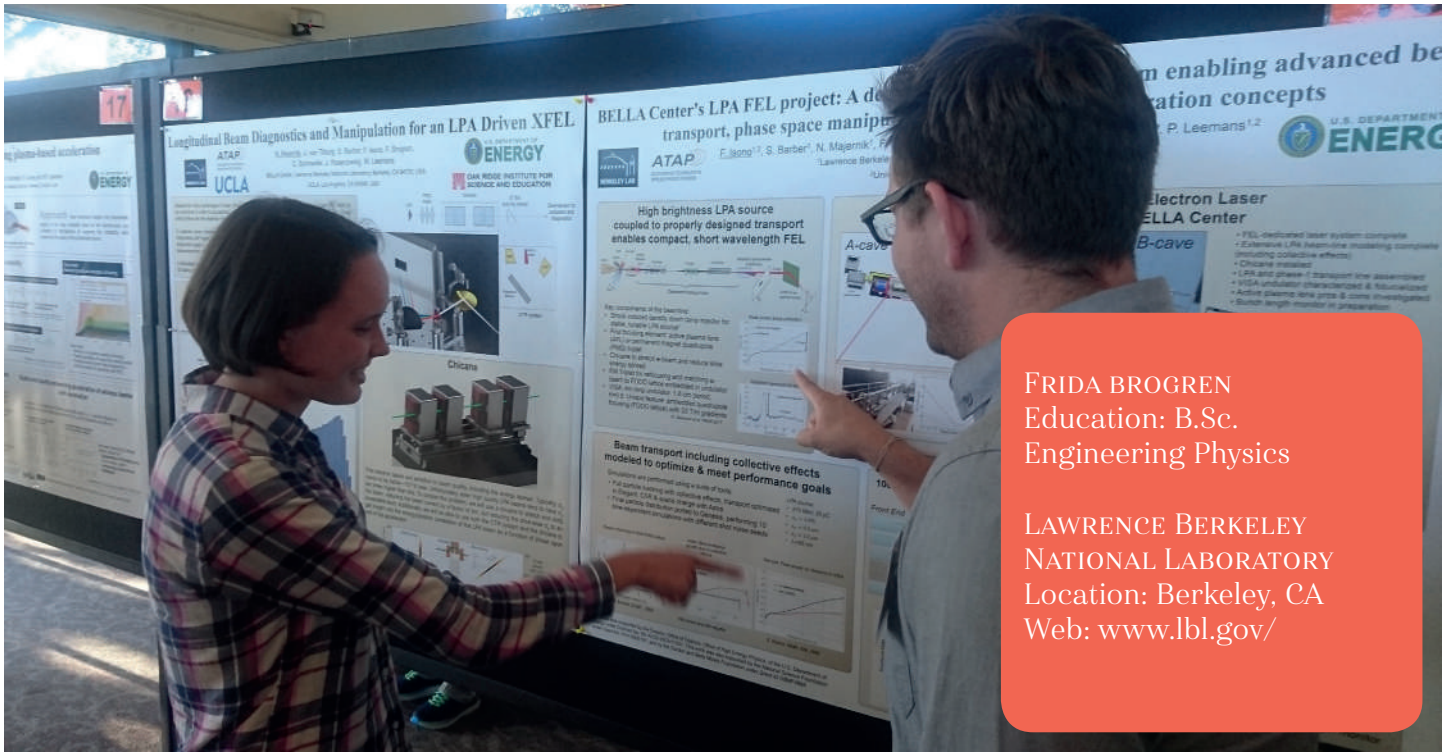
months I have been observing my colleagues and supervisor doing most of the work. They have been very helpful and pedagogic in explaining how the laser system and its components work, how to align the system, how their network system is designed and how to implement hardware. The work itself is very hands on, crawling on floors, connecting cables, adjusting mirrors, setting up cameras and filter wheels. But there is also a lot of analytic elements like examine the shape of laser modes and looking at timing of the system.

The goal of the project is to create something called an X-ray Free-Electron Laser beamline. The beamline can be sectioned into three parts. One laser modulating part which amplifies a laser pulse into high energy and focus it to a very small spot. This spot hits a gas mixture which ionizes from the high energy of the laser which also induces a wavelike movement of the plasma where some electrons can get trapped on the waves and accelerates to very high speed. The electron bunch goes through some modulation (mostly to concentrate the bunch in time) and then into an undulator. An undulator basically consists of a bunch of magnets facing opposite directions which creates a static alternating magnetic field. When the electrons go into this magnetic fields they experience a force (remember right hand rule) and starts to oscillate. The energy they lose is emitted as photons. Because the electrons have very high speed, they will emit photons with very high energy and small wavelength. Furthermore these photons will be coherent. Until recent it has been very hard to create coherent X-rays. "Traditionally" it has been done by large cyclotrons (a circular tunnel where particle gradually is being accelerated), technique by using plasma acceleration is rather new and can mean a real breakthrough in generation of coherent X-rays for research and other implementations. When I write this we just succeeded to accelerate electrons which was a big milestone in the project. It's very exciting to be a part of this project right now when things are starting to come together.

NOW I HAVE USED UP A LOT OF SPACE in this paper so some finishing words may be order. This has been awesome, experiencing different cultures, meeting new people, working at LBNL with interesting physics and great colleagues, exploring the Californian nature and wildlife and just trying to live life in a different country.

I want to thank my supervisor Jeoren Van Tilborg for being extremely supportive and welcoming, my colleagues Sam Barber, Fumika Isono and Nathan Majernik for always being helpful when something doesn't make sense, my manager Wim Leeman and the rest of the team for creating a great working environment. I also want to thank CETAC and all involved for making this possible.

FRIDA BROGREN



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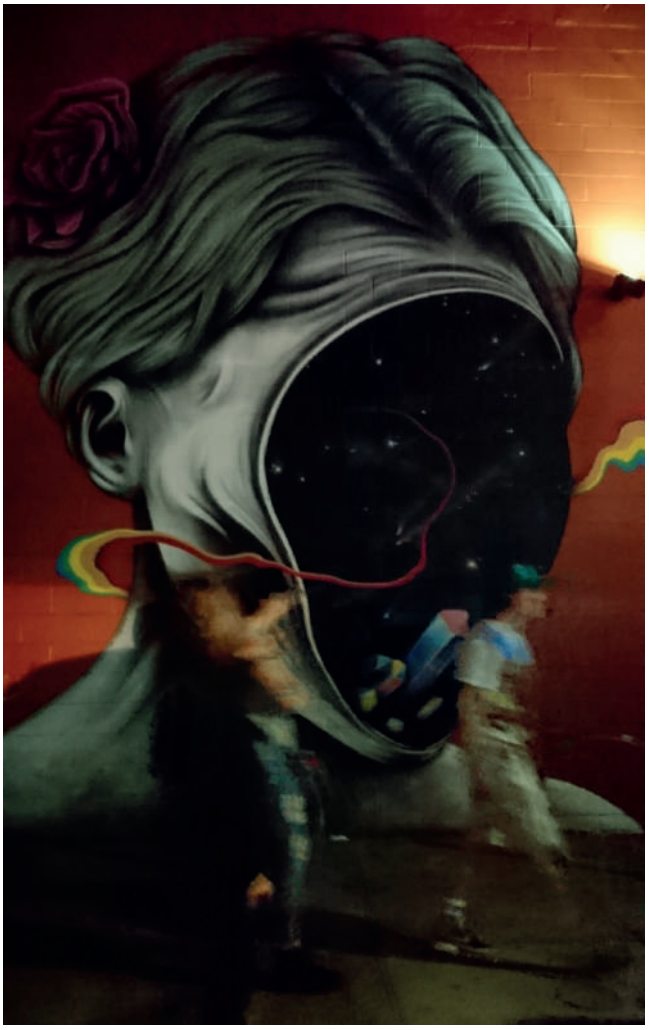


Sun, Ocean and Automated Motion

Can you imagine getting the news on a numbingly cold winter day in that you are going to move to a beach in Florida and build self driving robots for a year? We can, and since the beginning of the summer it has been our reality. Here is the story of what it's like breaking your chains and trying something completely different, yet in a way kind of familiar.

We decided to kick off our American experience with a bunch of travelling. Visiting both new York and Miami. The week we spent in New York was packed with everything from going on top the Rockefeller center and viewing the empire state building to visiting the back room, one of only two speakeasies left in NYC since the prohibition. After entering through the hidden entrance you got to the bar where beers were served in paper bags and the drinks were handed out in tea cups.

Soon our weekend in New York was over, and after travelling 3 hours south by plane we arrived in Miami. We visited Miami Beach where we enjoyed the views of the characteristic skyscrapers while swimming in the ocean. One of the days we also attended a baseball game between Miami Marlins and San Francisco Giants before it was time to head north to St. Augustine.

After being used to the living spaces of average student apartments we could not have been more pleased with the house in St. Augustine that the company provided. A two-floor terraced house right by the beach, definitely an improvement!

We would not stay for long though. After a couple of days of getting acquainted with the city and hanging out with the old interns it was time to pack our bags and leave yet another time. This time we ended up to Radford, a city in the western part of Virginia where we would spend two weeks learning the software that controls the AGVs.

During the weekend between the two training weeks, we visited Washington D.C, which was "only" (by american driving standards at least) a 4-hour drive away from Radford. In D.C. we met the interns at NASA, whom we shared a dinner with while listening to stories of each other's first few weeks in the US. Besides meeting the other CETAC-interns we took the opportunity to pose in front of the White House, as well as visiting the Library of Congress, and a few Smithsonian

Museums, which for the record is free to enter (apart from many other museums in the US). The Smithsonian Museums have a lot to offer, and each being located close to another, we managed to see a lot in one day. An interesting fact is that some of the museums dedicated to american history actually contain a lot of information about St. Augustine, where we currently live.

After having visited D.C. we returned to Radford where we would finish the last days of our training. This part of the training mainly consisted of learning how to program common functions for an AGV's PLC. An AGV's PLC contains function definitions of how the AGV should react in different situations. It is for example through the PLC code one define when to turn on a certain lamp, and how the AGV should react when someone has pressed a button. It is also through the PLC you define how the AGV should function during load and unload operations, which of course is the whole purpose of an AGV. For security reasons you often define a list of functions to execute in order, and so called hand shaking procedures to make sure every step is executed correctly.

After all of us had obtained the basic knowledge the training had to offer, it was time to return to St. Augustine. Now it was time to begin with our real work at Amerden! Amerden is a small company that has been manufacturing automated guided vehicles (AGV) since 1988. AGV:s are used by a whole bunch of companies to move things from one side of a facility to another. AGV:s have been used for many decades, but how the vehicles navigate through their surroundings and how they detect blocking objects are mainly what differs the AGV:s that were developed in the 50s from present day's AGV:s. In the 50s the AGV:s mainly followed ground wires, which they also used to signal their presence to nearby AGV:s, while today's solution most often contains a top mounted laser which detect reflectors which are used to triangulate the AGV's position in a layout. Today's AGV:s are often connected to a host computer which sends orders, and directs the AGV through its layout while trying to avoid deadlock with other nearby vehicles. Due to the small number of employees at Amerden, the responsibilities could vary a lot depending on the day. Niklas and Gustav being more familiar with electrical hardware and Marcus being more

familiar with software made the partition of the first available projects quite natural.

Niklas has mainly been working on designing electrical components. A big part of his time has been dedicated to creating a wireless transmission system specifically designed to prevent vehicle collisions. The transmitting units are using microcontrollers to generate the signals, which are then FSK modulated before being transmitted. The signals are then received, demodulated and interpreted in receiving units located on other vehicles. This allows for cross-vehicle communication.

For Marcus, the main project has been to program the software for a recently released display that will be attached on future Amerden AGV:s. The end goal is to, through the display, give end users information of the current state of the AGV, as well as to offer the ability to control certain parts of the AGV directly from the display, which will be useful during maintenance and troubleshooting.

One thing we all noticed is how much responsibility we got from day one. Here at Amerden all projects are more or less for a real customer and not just for the purpose of learning. One example of this is wiring an entire AGV from scratch which is what I, Gustav have been working on for the last weeks. Even though wiring hundreds of wires definitely can be tedious and challenging, you learn a lot from it and the feeling when the vehicle manage to drive by itself is amazing.

Due to Amerden's high focus on making us be a part of multiple stages in AGV development, we have after only a few months gained a lot of experience, which we will utilize on future AGV projects.

When we don't work, St. Augustine and Florida have a lot to offer. One of the most popular tourist attraction is the theme parks in Orlando. After some deliberation over which of the many theme parks we should try out first, the choice fell on Universal Studios. With 3D and 4D rides from movie franchises such as Spider-man, Transformers, Simpson and best of all Harry Potter it didn't disappoint us. The scenery and set piec-

Marcus Forsberg
Education: B-Sc. Engineering Mathematics

Niklas Forsström
Education: B.Sc. Engineering Physics

Gustav Karlsson
Education: B.Sc. Engineering Physics

Amerden Inc.
Location: Saint Augustine, Florida
Web: www.amerden.com

es representing the different movies were truly amazing. After a long day in the sun, we still had many rides left to try out if we decide to come back later during the year.

Besides the theme parks we have also had the opportunity to see a rodeo in a nearby town called Ocala. A rodeo is a show which has evolved from the old american country life, and contains events like bull riding, steer wrestling and much more. If you want a glimpse of the true southern american culture, attending a rodeo should definitely be considered. A few weeks ago we went to an american football game between Jacksonville jaguars and Tennessee titans. The stadium was packed with nearly 70 000 fans and everyone was having a good time, and we plan to visit even more games in the future.

We recently visited Kennedy Space Center Visitor complex, which is only 2 hours away from St. Augustine. We saw a few rockets, as well as the space shuttle Atlantis, and also tried out a simulator which was intended to mimic the physical sensations of a real shuttle launch. Our hope is to see a real shuttle launch during our year in Florida, and with Kennedy Space Center being close to where we live, it sure won't take long before we see one.

When we don't feel for going on a road trip like those above there are plenty of things to in Saint Augustine - Everything from relaxing on one of the best beaches in the US to visiting the Alligator farm nearby. Our life in the US has really kept us busy, and it will definitely continue to, until our year long internship is over. We have in the moment of writing, become used to our new life in St. Augustine, and we are curious about what the remaining time of our stay here has to offer.

"*A day without sunshine is like, you know, night.*"
- Steve Martin

Niklas Forsström,
Gustav Karlsson,
Marcus Forsberg

Sushi and space geodesy

THIS SUMMER THE TWO OF US HAD THE chance to try our knowledge in the world of space geodesy (basically trying to understand the shape, location in space and gravitational field of earth). We worked for a company called NVI, Inc who are working on a contract for NASA at the Goddard Space Flight Center. One part of space geodesy is VLBI, where signals from quasars are detected from different telescopes or antennas on earth. Think of it as the opposite of GPS technology! The uses of VLBI are many!

DID YOU KNOW?

VLBI is used for:

- Mapping tectonic plate movements.
- Spacecraft tracking.
- Imaging cosmic radio sources.
- Measuring the length of day.
- And lots of other things!

A TYPICAL DAY for us started with us trying to get to our office. We got to borrow bikes from a colleague at NVI, however American roads are not made for bikers and American drivers act like they have never seen a bike in their life before they notice us. While Martin had a pretty decent commute (40 seconds, give or take), Tilda had a 10 minute route of trying to share the road with the cars. Once safely arrived to the office, we mostly had the place to ourselves. Because of logistical trouble, we could not spend most of our time on site at Goddard. Instead we stayed at a office within hailing distance. There were some details that gave away that this had previously been a therapist's office. All the doors had soundproof padding, we had a ridiculous amount of couches, and there were boxes of

tissues everywhere. Of course, as a typical American office, the pantry was also filled with chips and sodas for us. While we couldn't stay on site, we always had lunch together with the rest of the group. The tradition of Monday sushi at the restaurant Osaka is still going strong! Since this is America, both of us got our fair share of burgers as well. When work was done for the day we had many opportunities to explore the area. It took about 45 minutes to get in to Washington D.C., we had a national park right around the corner, there are plenty of restaurants and shopping possibilities. Because of the nice nature, Tilda often went running during here spare time. The US is also filled with warning signs, sometimes for things that at least we think are obvious. As, when running in the woods, you know there is a possibility for limbs to fall down. In America they make sure to put up a sign! Actually, there is a sign for every little thing...

Biking in the U.S. was interesting. In downtown D.C. there were actually quite a few cyclists, surprisingly many, but not so much in

Did you know?

- NVI has had interns from Chalmers for 25 years.
- The first transatlantic VLBI session was performed between Onsala Space Observatory and the MIT Haystack Observatory in 1968.

Greenbelt. This is something Martin experienced once on his way home from Safeway (the American version of Ica), leading his bike and carrying a couple of shopping bags, maybe a few too many. A police car stopped Martin and offered him a ride, because apparently walking with your bike makes you seem like someone in distress. We doubt that this would ever happen in Sweden.

Of course we got some time on site at Goddard as well! We visited a fair that they called the "Science Jamboree", where all the different departments at Goddard got to display and brag about their work. Another favorite was visiting the Goddard Geophysical and Astronomical Observatory. This is where a bunch of different antennas are located, these are used for research all over the globe! We got to see the cleanroom where parts of the James Webb telescope had been constructed, a telescope that will study every phase in the history of our Universe. Whenever we were on site at Goddard we were not allowed to be on our own, but had to have an escort with us from NVI with us at all times, which made you feel a bit like you were a kid on a field trip. On the other hand, you couldn't ask for nicer people to be escorted by.

10 weeks is not a long time when, in Martin's case, you're completely new to the country. Tilda had lived in the US before, so she had the chance to catch up with her previous host family. There are some really great sights only an hour or so by car, at Great Falls National Park and Shenandoah National Park. Towards the end of our stay, NVI had a summer outing where the entire staff and their family were invited. This year the outing was a brunch on the Odyssey, a larger boat that traveled through the Potomac river while we dove into the brunch buffet. No one does belgian waffles better than americans. If you ever are in D.C., brunch is one thing you shouldn't miss. The bottomless mimosas are usually included as well! NVI also has an annual pool party, where Martin fulfilled his duty as a Swede and made sure everyone got to taste real (read slightly deformed yet delicious) Swedish meatballs.

When it comes to work, we were given a lot of freedom in completing the tasks that we were given. Martin was working on something called pressure loading while Tilda looked into gravitational deformations of antennas.

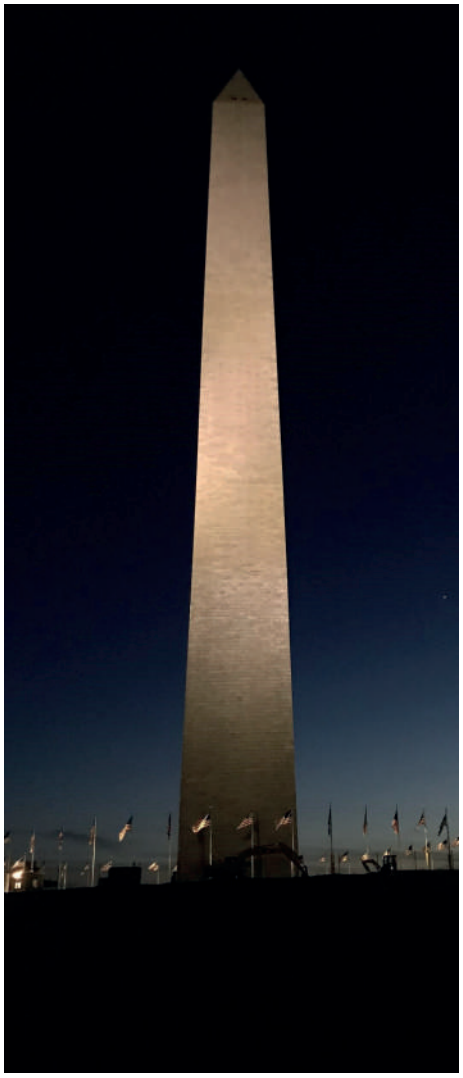
Atmospheric pressure loading is happening when variations in atmospheric pressure deforms the crust of the earth. You can imagine the earth as a giant spherical trampoline, or water bed. When you apply pressure onto a water bed it will adjust to the pressure and deform. In the same way, when you apply pressure onto the surface of the earth, the surface will deform,

if ever so slightly. So when mass distributions over the earth changes, for example when glaciers are melting, or when tides ebb and flow, or when there are fluctuations in atmospheric pressure, there will be a response in form of a deformation in the earth. These changes in mass distributions that occur over time will cause vertical and horizontal displacement of the surface. These tiny displacements are on the scale of millimeters, and aren't noticeable in daily life, but they matter for VLBI. Martin worked with writing code to compute the displacements from atmospheric pressure using weather data.

To understand the work Tilda did with gravitational deformations, first start by imagining an antenna. The antennas that are used in VLBI are a big parabolic shape that will focus the signal to a receiver in the center of the antenna. These are aimed in different directions to look at different objects. Since these antennas are anywhere between 20 and 100 meters in diameter, they will deform in different ways when they are positioned in different angles relative to their axis. Tilda's job was to write a program that could predict the deformations of an antenna using least square fitting and cubic splining. These deformations are usually just a couple of millimeters, but when working with VLBI these few millimeters really matter!

For both of us the job was very research oriented. We got to read articles, write code, run code, plot data, try to explain the results. Find bugs and make revisions. Rinse and repeat. It was incredibly rewarding to realize that the past coursework actually was useful! Spherical harmonics, Green's functions, boundary conditions, mechanics, numerical methods, least-squares, splines. Just one time after the other, things you had been taught turned out to be valuable. It's almost like there was some planning behind the curriculum at Chalmers, who would have thought?

Martin Henoch,
Tilda Sikström



Tilda Sikström
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IT in the Garden State

The story about a Swede who journeyed from Gothenburg to Bergen for an internship in IT. No, not Norway - New Jersey of course!

It was beginning of June when I got the offer to travel to the states for a yearlong internship. I didn't arrive until late July but thinking back it all went so fast that I'm not even sure how I managed to get a Visa, find a secondary tenant for my apartment, pack my entire apartment into travel bags and write a re-exam in the span of about a month. Suffice it to say I was pretty nervous about having forgotten something when walking up to the immigration officer at Newark airport. But since I'm currently writing this from a house in New Jersey I think it's safe to say I didn't and after paying for a ridiculously expensive taxi ride, I finally arrived at the house that my employer had provided for me. After saying hello to the two others living there, I promptly went to sleep in my room. 5pm on a Thursday.

The next morning I was greeted at the door by my would be supervisor Tom who after a short introduction drove me to work. On that day I learned two things. That the public transport up here is close to non-existent unless you're going to New York City and that my company has about the same number of German speakers as they do heve English ones. Makes me sort of regret doing 5 years of Spanish in school but hey, at least they gave me a car.

Rema Tip Top is an automotive and industrial manufacturer. I work at their US headquarters in the IT department. Rema is not an IT company and because of this my department is relatively small with a team consisting of my manager Tom, our IT Engineer Olaf and me. Together we maintain both the company's own infrastructure and we also act as tech support for our end users. My daily work tasks can vary pretty wildly but they're usually related to server or database manage-

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ment and programming with some occasional tech support sprinkled in between. Pretty much all of our hardware is maintained on premise and while it mostly consists of Microsoft products we also run a few Linux servers as well. Currently I'm working on developing a new tool for the company to generate sales reports. The tool I'm working on is essentially aggregating data from an Enterprise Resource Planning system (ERP) which is just a fancy word for a database that stores tons of different company and business-related information. I hope to be able to start rolling out this tool in the following months.

Situated at the border between New Jersey and upstate New York is Bergen County. I live here in Woodcliff Lake and work in Northvale. Individually these two towns are pretty small with a combined population of only around five thousand. They're so small in fact that mentioning them in a conversation to anyone from the city usually just leads to confusion so instead everyone here says they're from north Jersey. Now don't get me wrong, while Bergen might not have the big city feel of New York it certainly is not a small place. The county has around 70 of these towns back to back with a population rivalling that of metropolitan Gothenburg in about a sixth of the area which is not so strange since New Jersey is after all the most densely populated state in the country. Something you will immediately notice as soon as you attempt to drive southward.

Now while Bergen is not quite like the big city to the south there are still plenty of things to do here. Like going to the big city for example which happens to be the only direction public transport will take you. A bus or train ride gets you directly to downtown Manhattan in about 40 minutes as long as you don't go during rush hour while train on the other hand is around an hour. You can of course also drive to the city like a true local. I have never actually attempted this feat myself but

I have heard tales of people being stuck in traffic for upwards of 4 hours while attempting to enter the city. Outside of visiting New York there are still plenty of things to see and do around here. North Jersey is surrounded by tons of state parks and nature reserves so naturally when I got here I soon found and joined a group of outdoorsy people from New York that I've done lots of hiking, biking and most recently skiing with. I've even been able to visit a few other states. Most recently two of my best friends and Chalmerists who are currently studying in Atlanta.

ALL IN ALL I'M VERY GRATEFUL that I got the opportunity to come work here in the US. Coming here has been a big step towards getting outside my comfort zone, getting to share and experience different cultures and ultimately grow as a person. Joining CETAC has been one of the best decisions of my life and I highly recommend anyone looking for an adventure to do the same.

WILLIAM HJELM

Go Red Sox!!

THE FEELINGS I FELT TOUCHING down in Boston at Logan Airport on June 4th can be conveyed in four words: confused, exhausted, excited, and absolutely terrified. Having had a messy move away from Gothenburg, I was completely stoked to spend the rest of the week getting settled at my new place. At the airport I was met by the welcome and welcoming faces of Waldron and Francisco, presumably keeping an eye out for the confused kid with six bags.

-RENEE

WITH A LONG HISTORY OF CETAC INTERNS, Bison has really streamlined their intern onboarding process. Both of us managed to write, merge, and have code promoted to production on our first day. Bison has a lovely way of keying interns into the development work by throwing a more substantial project at you a few weeks into your internship.

Given its long relationship with Chalmers, CETAC, and Gothenburg, elements of Swedish culture can be seen and heard all around the Bison office. Most notable is the semiweekly office ”fika”, a department in which the US seems to be miles ahead of Sweden.

AFTER HALF A YEAR OF LIVING IN BOSTON, life in America has become routine. The crammed T and the skyscrapers outside the office no longer amaze me the way it

did when we arrived in June. However, even after half a year of software development, work is anything but routine.

-Marcus

Massachusetts, and Boston in particular, is the world Mecca of education. Just in the city there are 52 schools of higher learning, including such distinguished institutions as Harvard and MIT.

Working for a startup

Having always had a huge software interest, being a professional developer has always been a dream for us both. In the industry today there is a divide between the huge enterprises and the start-ups. The methods and practices of the tech giants don't always apply to the small developer teams of start-up companies.

Our sponsor, BISON, is a start-up in all senses of the word! While we no longer have a ping pong table (it was removed a month before we arrived due to space constraints), the playful environment is absolutely there. We have a kitchen comically packed with snacks and drinks, a couple of secluded rooms when you need to 'stay in the zone' and juggling balls all over the office, if you've got restless hands.

East over west

When discussing of software development in U.S, one tends to think of California, and Silicon Valley in particular.

While Silicon Valley remains the capital of the IT giants, other hubs for tech workers have started to crop up. Boston, with its high density of academic institutes, has a lot of the ingredients required for a healthy startup environment.

The climate of San Francisco is often a selling point for aspiring developers, and this is one area where Boston can't compete. The extreme humidity of the east coast makes the city hot and sweaty during summer and biting cold during winter. Spring and autumn barely register as the temperature drop and season change happens seemingly overnight.

Housing, while slightly less crazy than San Francisco, is still incredibly expensive.

Unlike California, Massachusetts public transport is extensive and well run. That means there is no need for a car in Boston - as everything is connected by the T and busses with a frequency almost on par with Gothenburg.

For those interested in sports, there are few places in the world that would better suit you than Boston. Having the undisputedly best both baseball and American football teams, as well as successful hockey and basketball teams, means there is always action. In every sports bar across the city you're sure to find a couple of die-hard Bostonians, cheering for their teams.

Making friends in America

Coming here meant leaving everything in Sweden behind, including friends and family. While we're working full time, evenings and weekends leave plenty of free time. The first couple of months were intense, doing our best to get up to speed at

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work and getting used to the move, but as things slowed down and became routine, the need for a community increased.

Thus, making new friends is of the utmost importance. Luckily, due to the ridiculous rents, everyone lives with roommates, which, if you play your cards right, leads to new connections.

This has held true for us, and we both now have a social circle outside of work.

Mastering the language

Saying we didn't know the language when we arrived would be a lie. But knowing how to speak English and living in an English-speaking country are two separate things. The curse and slur filled English you pick up online does not cut it in a professional setting, so adjustments had to be made. To combat foul language, we introduced a "swear jar" at the office, one dollar going to the jar each time someone cursed. Two weeks, and $60, later - the swearing had been substantially reduced, and after another week we had consecutive swear-free days.

A few months into the internship mental changes occur, suddenly your dreams and thoughts are in English. You find yourself looking for words when talking on the phone to Swedish friends and family. What you were previously mentally translating from Swedish to English, you now have to translate in the opposite direction.

An intern's future

Both of us will stay with Bison, to some capacity, after our internship, which has been the case with all of their previous interns as well. The very first Chalmers intern working for Bison is now head of the Gothenburg office, located in Vasastan.

Two offices, with an ocean in between them, in different time zones and languages, threatens to split the team. To counteract this, the company is very adamant about sending each member from both countries, to the other, at least once a year. That means that for every year we work for Bison, we have a Boston trip to look forward to.

The value of being valued at work

There is, in addition to the yearly trip, so much that speaks to how much the company values us interns. Not only are we invited to extravagant company parties and lovely Christmas gifts, but the best part is that we get constant, mostly positive, feedback from our superiors. While this might seem like a small gesture, it really helps insuring us of our value - and that what we are doing are important, even integral, to the company.

At Bison, interns are not hired to make coffee for the seniors, but are expected to evolve into fully-fledged engineers, and are given the tools to do so. We both have a real stake in the product we're contributing to, and the decisions we get to make leave a mark on the way real users interact with it. In addition, we get to see the end results of the successful portion of those decisions, as well as learn from the consequences of the mistakes we make.

In conclusion the year in North America has a whole bunch of upsides and leaves us with very few complaints! If you want some time off school and are looking for an adventure, CETAC offers just that!

Marcus Linderholm,
Renee Gyllensvaan

CETAC 2018 IN SWEDEN

When signing up as a member of CETAC, you get much more than just a chance to get an internship in North America. Members get a chance to meet new friends, get used to talking to companies and, of course, have a lot of fun.

The year traditionally starts with a trip to Stockholm in September. One Thursday morning we met up at Gothenburg Central station, everyone dressed in suits and prepared to mingle with tech companies. Once arrived in Stockholm, we checked in to our hotel and prepared for our first company visit. This was an after work with Netlight, a consulting company. Netlight had some great presentations, awesome food and plenty of drinks for us to enjoy while getting to know the company and how life could look like for a consultant.

The next day we had a meeting scheduled with Spotify, where we had the opportunity to walk around in their headquarters. Honestly, it seems like they have more break rooms than work space. There were ping pong tables, gaming computers, TVs, bean bags and so much more. Our time in Stockholm also allowed us to get to know each other, while eating dinner and exploring Stockholm together.

Another highlight from this year is Thanksgiving. We invited CETAC alumni, cooked 6(!) turkeys and prepared a lot of other American food for our Thanksgiving dinner. This was a chance for our alumni to reminisce about their time abroad and for the current members of CETAC to get excited about their adventure.

With a great start in Stockholm, and lots of activities during the year, out members stayed motivated and worked together to fulfil our common dream - to get to North America.

TILDA SIKSTRÖM

Stockholm

Thanksgiving

The Chairwoman Speaks

While writing this, I have already finished my internship and I'm trying to remember how I felt like when I was appointed chairwoman, almost a year and a half ago. It seemed like such a long time until the summer of 2018, when the internships start. Sorry for the cliché, but time flies when you're having fun.

For me, the American life was something I had already experienced. Before starting Chalmers, I lived in the US for a year. Since one of the responsibilities for me was to help members get through the visa process, it was comforting to have already done it once. I had had the chance to use my knowledge from Chalmers and apply it while working for a company. I certainly learned a lot and had a wonderful summer.

What I didn't expect was the number of partners we would be in touch with during our year in Sweden. We help our Swedish partners reach out to students at Chalmers, with lunch lectures, hackathons or an evening event. When these companies come to visit, students get a unique chance to see how their studies could be applied to real life problems - something that is a great motivation to work hard while in school. A big thank you to all our Swedish collaborators, without you CETAC would not be what it is today.

I would also like to send a big thank you to our North American host companies. All of our members have been very excited to live and work in a new country, and everyone has always been made feel welcome and well taken care of. We are glad that this experience helps both the intern and the host company to grow and see things from new perspectives.

My fellow board members and I also took the huge task of reforming the CETAC structure, making sure that CETAC is all about working together to reach our internship goals. With the help of the board of 2017, that answered all questions we have had during the year, we are very happy with the reformation. To everyone from CETAC 2018 - great work, it has been a pleasure to work with you the past year and a half. To the members of CETAC 2019 - best of luck, you have a great adventure ahead of you.

Finally, to you who is reading this right now, I hope you feel inspired and are interested in joining CETAC. I promise, you will not regret it.

Tilda Sikström
Chairwoman, CETAC 2018

THANK YOU!

On behalf of the board and members of CETAC 2018, we would like to thank all our corporate partners and other contributors that made this project a reality.

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