

Taylor Vision

Taylor Trip 2018 Edition



About us

Board 2017/2018

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Edition

Taylor Trip 2018 Edition

History

Taylor is the study association related to the department Precision and Microsystems Engineering of Delft University of Technology. The association was founded in 1988 to enhance the study experience of the students. The Taylor Foundation, in its legal form, was subsequently founded in 1992, making it an official organ in the TU Delft. During this time, the department changed its name from "Production Engineering" to the PME you are all familiar with.

In contrast to what many people think, Taylor is not named after the famous mathematician known for the Taylor expansion. It is named after the mechanical engineer Frederick Winslow Taylor, who was active in production engineering and industrial efficiency.

The logo of Taylor was inspired by the tip of an Atomic Force Microscope, an instrument that requires technology from all the divisions of the department.

Taylor aims to enhance the study experience of the students by: trying to improve the relation between the students and the department staff, bringing the students in contact with the industry, providing the department with student feedback about courses and, last but not least, organizing recreational events to de-stress from the hard working life as a PME student.

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From the board

Dear reader,

Welcome to the Taylor Vision: America edition! This special edition of our magazine will tell you all about our time in San Francisco and the things we learned during the trip. As you may know, the main goal of the Taylor Trip is to teach our students about the differences between the Netherlands and a foreign country in both the industrial and the cultural world. This year, in the USA, that is exactly what we did. The organization worked for months to arrange a nice programme and after many calls and long nights, a trip that was good enough for our students was there. Seven educational excursions, two days of cultural activities and two free days were successfully planned. I am proud to tell you that, besides from a small setback on the day of departure, everything went very smoothly.

The fact that there were no problems during the trip is not only due to the board. I want to use this opportunity to thank Michiel and Maurice for helping us with the planning and for being part of the organization. Another big help was the professional network of Lola, who got us into two nice companies. There is however a single most important aspect that can make or break a trip like this, and that is the group. We were very happy with our group of interested, dedicated students (and of course Alejandro). They had a lot of respect for the organizing team, and they made Taylor look very good by asking difficult and relevant questions during the excursions.

If I am very honest, it was not just an educational trip. We also explored the San Francisco night life, but some things that happen in SF stay in SF, so I will not elaborate more on this. All in all it was an amazing trip and it was a lot of fun to organize it and to be part of this group. If you are interested in more detailed stories of our trip, please continue reading and enjoy!

Yours sincerely,

Gijs van der Velden

Recent graduates

The following students have recently graduated from PME, congratulations to all!



Niek van Hoek, specialisation: MSD
Design for additive manufacturing of decoupled compliant parallel mechanisms

Kenny Lam, specialisation: MSD
A large stroke load-carrying member based on STEMs

Miranda Looman, specialisation: MNE
A study to understand fouling by diffusion in microfluidic systems resembling an Organ on a Chip system

Roy Jansen, specialisation: MSD
Actuator system for the flowerbed

Koen Baron, specialisation: MSD
Ride comfort optimization of cable free elevator

Menno Huigsloot, specialisation: SOM
Topology optimization of constrained eigenfrequencies

Sander Allebrandi, specialisation: MSD
Microcapillary magnetorheometer

Recent graduates

Sophie Soons, specialisation: MNE

Photo-patterned pH-responsive hydrogel membranes for integrated fluid control

Silvan Viëtor, specialisation: MSD

Tunable magnets: modeling and validation for dynamic and Precision applications

Savio D Souza, specialisation: MNE

Resonant Modes of Hollow Micro-cantilevers for Characterization of Liquids in Picolitre Volumes

Ata Keskekler, specialisation: DMN

Characterization and Dynamics of a Diamagnetically Levitated Object

Lola Giuffre, specialisation: MSD

Design of a Bistable Stapes Prosthesis

Lennart Nieuwenhuijse, specialisation: DMN

Robust experimental dynamic substructuring: enhanced quality indicators & application of SEMM to an industrial case

Bart Entink, specialisation: MNE

Effect of flow conditions on nanoparticle aerosol deposition for direct writing purposes

Barend Doornenbal, specialisation: MSD

Zero stiffness compliant shell mechanisms based on thermally prestressed composites

Janeau Janssen, specialisation: MSD

Compliant Remote-Center-of-Motion mechanism optimized for Energy Dispersive Spectroscopy

Abhishek Sharma, specialisation: MNE

Developing a microfluidic device incorporating submicron topographies for studying bone regeneration

Robert Kramer, specialisation: MNE

Multiscale 3D-printing of a suspended polymer microfluidic device

Taylor Trip 2018: San Francisco

The United States of America, a country of freedom and endless possibilities. The destination of the Taylor Trip 2018 was the state of California, the golden state known for Silicon Valley. A great trip in an even greater country.

The San Francisco bay area was the focus of our trip, which is enclosed by the large cities of Oakland, San Jose and of course San Francisco. We spend most time in San Francisco as it gave us lots of opportunities, both cultural and high-tech. There are a lot of different sides to the city to be explored, as it is located between the bay, the pacific ocean and lots of nature reserves. Furthermore, within San Francisco different cultures intermingle which makes every part of the city feel and look like a whole different experience. It also means there is no real individual or typical resident.

The high-tech environment in and around SF had lots to offer, a combination of companies and the biggest universities in the area gave us great tours around research centres and great halls of inspiration. Everyone also had to chance to "play" with a multi-million dollar machine and in combination with all the enthusiastic talks it was an exceptional trip to be part of.

Schedule:

Date	Activity
July 11 th	Arrival day!
July 12 th	Semicon-West Conference
July 13 th	Surgical Intuitive + KLA-Tencor
July 14 th	Bike tour
July 15 th	Free day
July 16 th	Berkeley
July 17 th	SLAC + Stanford + VDL
July 18 th	Free day
July 19 th	Autodesk
July 20 th	Angel Island & Alcatraz
July 21 st	Departure day

July 12th: Semicon-West

The first day!

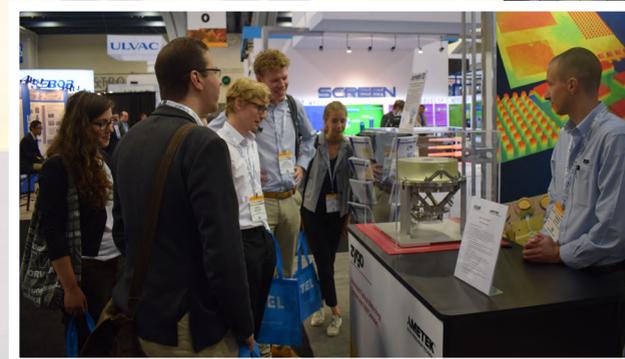
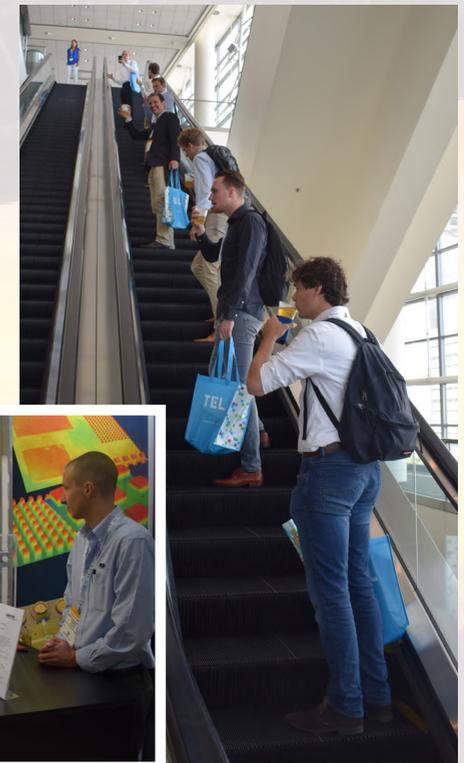
The first day of our Taylor trip to San Francisco! Or at least, for some of us it was. Due to a cancellation of Icelandair, about half of the group was left behind in the Netherlands to re-apply for a spot on the plane the following morning. Don't worry guys, as will become clear in this narrative, the day wasn't even remotely interesting. Anyway, we were rebooked to several different flights. I found myself on a plane to Minneapolis with none other than Lola Giuffré, a girl that proved to be quite capable of drinking her head off in an airport sports bar during a 3-hour stopover. We eventually arrived (stumbled, in Lola's case) into SF and got to the Orange Village hostel with the rest of the group, who'd travelled via Portland, Seattle or even Japan.

The next day provided enough entertainment to last for a lifetime. First, a 65-ish year old woman hijacked me during breakfast to talk about the opera scene in San Francisco. She appeared to be living in the hostel, but was in denial about it. It was lucky I met her, because later she turned out to be an amazing cook. She made these doughballs soaked in some sort of fat, it was amazing. I would call her up for her recipe, but on some level I still suspect her to be some kind of serial killer.

After breakfast we went to Semicon-WEST, a conference where the purpose was to collect as much garbage as possible. Thijs and Alejandro were especially driven to achieve this accomplishment and returned with no less than two burlap sacks filled with valuables. We ate some taco's and drank some disgusting beers in a small lunch spot, while trying to count our lucky stars about how well the day was going. After lunch we went to the solar panel part of the conference, where one brilliant company managed to provide us with unlimited draft beers. Luckily Alejandro stepped in to lecture us about the important aspects of such a conference, otherwise we would have probably went Lola-style all over the conference floor. (Seriously, I cannot stress enough how drunk she was on the plane. There are limits.) Alejandro taught us about the responsibilities related to the excessive intake of alcohol, something we as a group are very thankful for.

Back at the hostel we found out the rest of the group had arrived. We went to some Asian restaurant and wrapped up the night there. We stayed up till 10 at night, doing shots of chocolate milk. Thanks Alejandro, for teaching us you don't need alcohol to have fun!

Written and partly exaggerated by **Arnold Smolders**



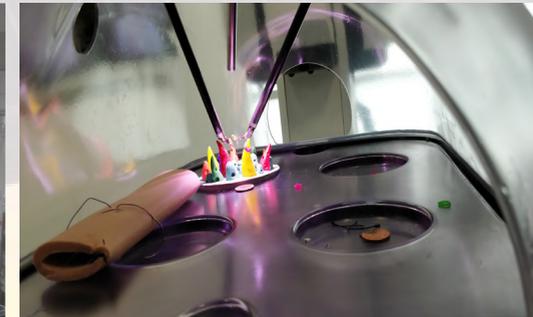
July 13th: Surgical Intuitive

On Friday we had the first two company visits scheduled: Intuitive Surgical and KLA Tencor. It was also the first day we were all together due to the flight delays, and it was the first day to suit up. This raised some difficulties in preparation, as some people forgot how to tie a tie and decided to do it during the bus ride. This was not very uncommon in America as it seemed, since we also saw a woman putting her make up on behind the wheel (America, fuck yeah). The bus was as American as could be; very big, very powerful and very cold because of AC. On the way we could see a lot of nice buildings and sites, including the beautiful main building of Oracle and the NASA Ames Research Center, which contained some very interesting looking zeppelin hangars.

After about an hour we arrived at our first stop: Intuitive Surgical. Although the name is not very well known in the Netherlands, their product is: the Da Vinci surgical robot. With this robot surgeons can perform surgery from somewhere else in the room by moving around certain input arms on a console which is mapped 1-to-1 onto the robot arms. These arms can hold different tools like a camera or a gripper. It is supposed to be minimally invasive, which makes the surgery less traumatic for patients. We were welcomed into a conference room where we got an introduction of the company's activities and the career path of our contact person, who was contacted by Lola. She had done quite some different things and seemed to be a destined mechanical engineer, showing among other things a picture of her as a student doing maintenance on a motor bike in a parking lot at her university.

Though this passion and her admiration for certain aspects and working principles of the human body, she had no trouble whatsoever keeping our interest for an hour or so. After the presentation we went into the demo room where there was an actual demo of the Da Vinci XI robot. This is where the fun part began: we were all given the opportunity to try, which was a really cool experience. Although from the outside it seemed quite difficult, everybody picked it up in no time (PME students tend to be good at things) and we had a lot of fun. We continued to the factory, which was just across from the first office. We had seen plenty of factories before, but what definitely struck out was the level of control-freakness that was present. Literally everything had bar codes to be scanned when used and should be placed in tape-indicated areas, even a computer keyboard! The most ridiculous to me was a radio frequency locating device specially there for tools, to know where they are for calibration. All in all, they manufacture an impressive amount of 5 units per day.

Surgical Intuitive + KLA-Tencor



July 13th: KLA-Tencor

After having the most awful fast food lunch, which came to be a running joke throughout the rest of the trip, we drove down to Milpitas for KLA Tencor. KLA Tencor is according to them the main competitor of ASML, but their product is a little different. Instead of making chip production machines, they make scanning machines to check chips for production errors. This way they can stop the manufacturing of faulty chips as early as possible to reduce wasted production costs. Another essential difference with ASML is that they do most of the design and manufacturing themselves, whereas ASML for instance outsources a lot. Upon arrival we were immediately raised into "bunny suits", the suits you wear in clean rooms. Their clean room was of class 100, meaning 100 particles of more than 0.5 μm were allowed per square foot. Nice about the tour was that the guide took all sorts of panels off machines to allow us to look inside to see mostly optical systems, which in the end gives the best impression of the incredible engineering that is involved. After the cleanroom tour and some coffee we went into a conference room with our contact person for a similar presentation as at Intuitive. His approach to gain our interest, however, was different. He decided to be the funny guy, constantly trash-talking ASML and asking us whether we had ever seen an iPad before in Europe. This engaged us into an extensive conversation with lots of questions.

The last activity on the list was after dinner: beerpong Olympics. This turned out to be the most competitive activity of the whole trip, up to the point where team captains had to meet and hear a talk about how to act and behave etc. Despite all this seriousness we tried to make it enjoyable for everyone and we did, but most importantly of course, Delft brought home the Win (remember PME students tend to be good at things).



Albeit an extensive day, all activities were most interesting and fun and I look back at it with great pleasure. Special thanks of course go to Lola and Marc for arranging the trips to these amazing companies!

Maurits van den Hurk



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July 14th: Bike tour



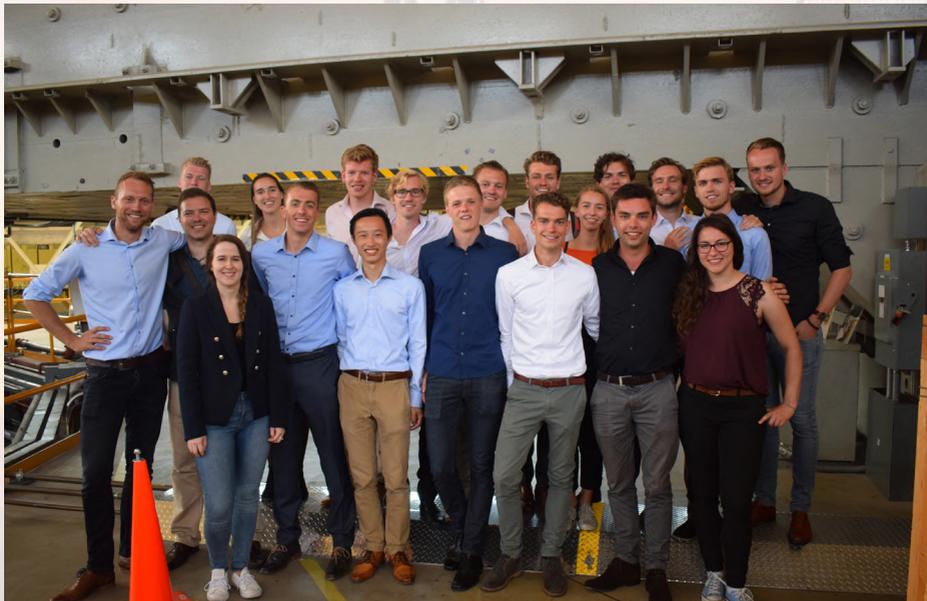
July 16th: Berkeley

Visit at Berkeley or The day Jeroen got a new nickname

It was still early when we took the BART to Berkeley, where we hopped on a bus that drove us uphill to the Advanced Light Source (ALS). Now let me describe the scenery for you. Imagine a secret spy base or nuclear factory built upon a hill and then abandoned for several decades. It had an industrial and estranged feel to it (at least to me) even though the ALS itself is not even that old (finished in 1993).

We got a tour around the ALS which is a circular particle accelerator where electrons are traveling at nearly the speed of light. During this process, they emit ultraviolet and x-ray light which is then directed to several experimental endstations for scientific research. At the ALS we also learned that there are many purposes for aluminium foil (which is reminiscent of a "Weird Al" Yankovic song: Foil).

After a much needed coffee break we continued with a tour of the National Center for Electron Microscopy where they got a wide range of research going on. After some nice TEM (Tunneling Electron Microscope) pictures it was time for lunch with a fantastic view. Our enthusiastic hosts brought us to a balcony where we could enjoy our food while getting even more sunburnt (after Saturday looking red in the face was the rule, not the exception) and later pose for an extensive amount of photos (supposedly for LinkedIn), because one cannot simply let such a backdrop opportunity pass.

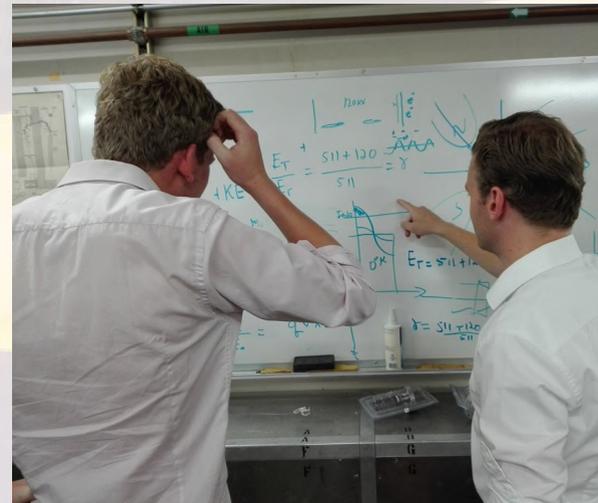


Then it was time for a clean room tour by Jeroen van Tilborg, but not after first having to listen to an introduction talk where some might have had some difficulties with keeping their eyes open. Now, you might be thinking: Jeroen van Tilborg, that sounds Dutch. That is because he is Dutch. He pursued to tell us that Americans have a hard time with pronouncing Jeroen and came up with some examples which sparked the new nickname of our Jeroen. I will leave it as an exercise to the reader to guess this nickname. During the cleanroom tour we learned about lasers, magnets, x-rays, plasma and some competition going on between Berkeley, China and France. We are all betting on Jeroen of course.

Back on the bus we went, downhill this time. On the Berkeley campus we met up with another Dutchman, who was not called Jeroen. He was doing his postdoc here and gave us a mini lecture on his current and previous projects concerning piezoelectric phenomena. This was followed by a lab tour where we spotted even more aluminium foil.

We ended the day in style with burritos, nachos, huge pizzas, some pitchers of beer and of course the usual card games.

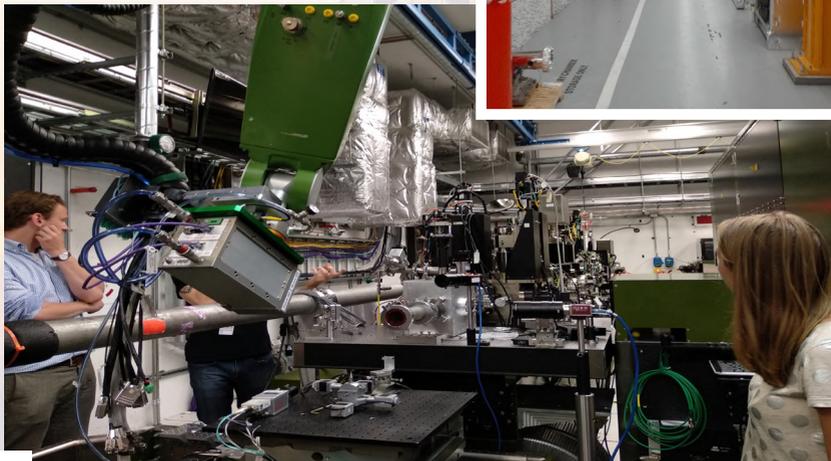
Dian Veldkamp



July 17th: SLAC

Tuesday was the second day of our university lab tour. After we had been to the ring accelerator in Berkeley the day before, we were about to go to the longest linear accelerator in the world.

The morning started with a bus ride to Stanford of which the SLAC is part. Upon arrival, we got to see a video which explained the importance of this research facility. Throughout the years, many breakthroughs in physics could not have been realized without the SLAC which even resulted in three Nobel prizes. Thereafter, we got a tour around the facility including a look inside the 3.2km long accelerator tunnel. Fun fact: a vertical correction of over ten centimeters had to be made to create a straight tunnel due to the earth's curvature. Since we were standing somewhere halfway through the tunnel, we couldn't see either one of its ends.



July 17th: Stanford + VDL

The SLAC is located within a five-minute ride of Stanford university's campus. Of course, we couldn't head back to San Francisco without taking a look at one of America's top universities.

Although expectations were high, we were not disappointed. Stanford's campus can best be compared to a small village which would not be out of place in Rome. An hour was planned to have lunch and walk around the campus. Next, we got to see around ten thesis or PhD projects related to high-tech engineering. I think most of us were willing to start working there right away.

The day was not over yet. VDL, a Dutch company with an office located in Silicon Valley, invited us to join for dinner. In exchange, we were of course happy to listen to a short presentation about their company which happens to be in charge of the production of all mini coopers. Finally, we ended up in a very American bar together with the guys from VDL. We had some drinks, talked about internships and jobs at VDL and played some rounds of pool, after which it was time to head back to our hostel in San Francisco.

Ramon de Koning



July 19th: Autodesk

Thursday, July 19th, the last company visit during this amazing trip. The lucky company today was Autodesk, an American multinational software corporation that makes software for the architecture, engineering, construction, manufacturing, media, and entertainment industries. We were expected at 1 PM, and it was a 20 minutes' walk to the pier where nearby Autodesk was located. Before we went to Autodesk we went for a fast bite at Breaking Bad, which had some amazing sandwiches. Everybody was already suited up, and by coincidence the coming weekend there was the 2018 Rugby World Cup Sevens. Those two things combined, and due our beautiful matching ties, everybody of course thought we we're one of the rugby teams.



After the amazing lunch we went to the Autodesk Gallery, where it can be seen how design shapes the world, from the buildings we live and work in, to the machines that propel us forward, to the products that enrich our everyday experiences. All sort of different products, designed by using Autodesk, were showcased and explained. Somewhere in a corner of the building, a driving simulation was showcased where you could take place in a racing chair and race a supercar that you'd chosen. Of course some competition was present here, trying to beat the best times. After the tour through the gallery, there was a workshop where we could work with the software and design our own chair.

After the Autodesk Gallery we went to pier 9, a hub for research, development, and demonstration of new manufacturing technologies and workflows relating to configurable microfactories. Because this technology center of Autodesk was located at the pier, you got an amazing view of San Francisco and surroundings. All in all this day was again a success just like the others and a lot was learned.

Marc de Graaf



July 20th: Angel Island

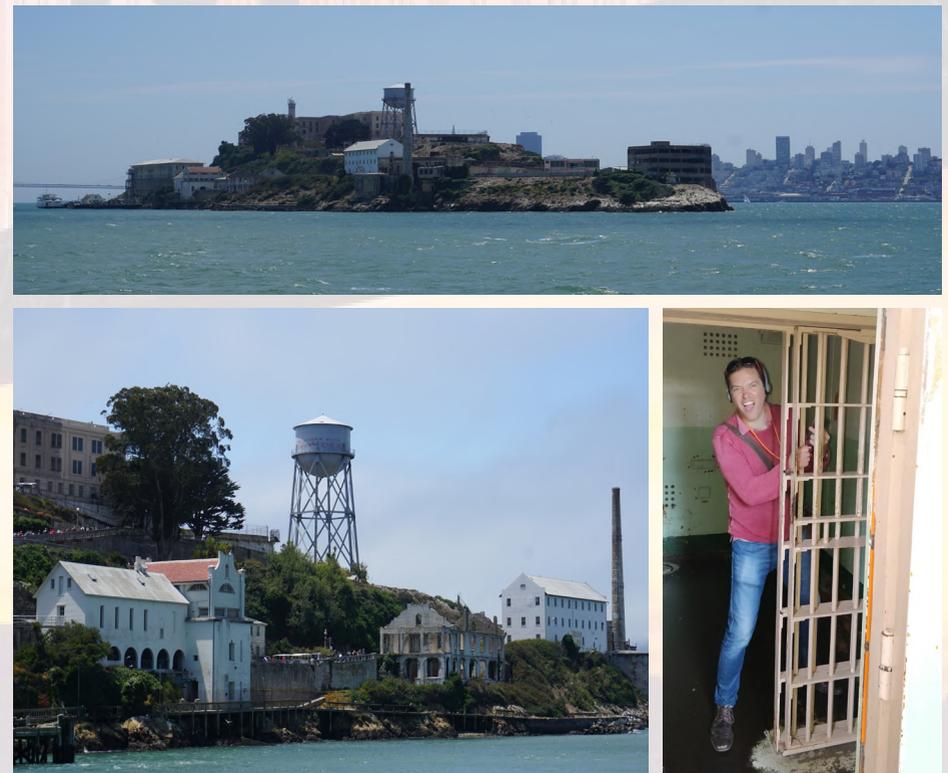
There are two things that come to mind when someone says San Francisco: Golden Gate Bridge and Alcatraz. We already saw the Golden Gate bridge on our first cultural day with the bikes, so on the last day of the trip it was time to pay a visit to the world's most famous prison. However, there was one stop in between: Angel Island. This underrated attraction is one of the many national parks near San Francisco with beautiful nature and a rich history. So we hopped on the boat and the day started. We had a comfortable time on the boat and Alejandro and Gijs spotted a dolphin on the way. Alejandro may claim that it was much bigger than a dolphin, but it was a dolphin. When we arrived on Angel Island, the busses were waiting for us to take us for a nice roundtrip. Our guide had his facts ready and taught us many things about the former residents of the island, the buildings and the animals that live there now. He also told us that it was our lucky day, because only two days a year the weather was cloudy and we happened to be there at one of these days! After the bus ride the weather got better and we had a nice lunch in the sun. Our time at Angel Island was lovely, but after lunch we were ready for the main part of the day: Alcatraz



July 20th: Alcatraz

You may have heard of this place called Alcatraz or 'the rock'. This was the best prison in the world at its time, keeping the most dangerous criminals away from society. The escape of Clint Eastwood in 1962 and the high maintenance costs of the island caused the prison to close and to become a tourist attraction. Since we were a big group of tourists, we could not miss this visit. We arrived at the prison and everybody hurried inside for the tour. There was an extensive audio tour that took us to every corner of Alcatraz. It was very informative and for a moment we had the feeling that the prison was still operational. We learned about the different escape attempts, one even bloodier than the other, and about the ways they were stopped. Of course there was also a big part about the successful escape and the speculations whether the prisoners ever made it to shore or they drowned in the cold, cold water. After the tour we went back on the boat and we looked back at a fantastic day on the two islands.

Gijs van der Velden





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Meet the new board



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Treasurer

Michiel Zult
Internal affairs

Maurits has got it all: Great friends, a beautiful girlfriend, extremely high grades, a strange affection for the number "19", unbelievable taste in music, awesome skills on the piano and, most of all, he is the new chairman of the Taylor Board. So, you might be wondering, what makes Maurits such a good chairman? Well, to us, the answer to this question is really obvious: He is the tallest member of the board.

Being tall is not "Mau's" only quality. He is also quite a sociable guy. Feel free come by the office and grab a cup of coffee with Maurits or enjoy a nice pint after work hours. Maurits is a diverse talker, capable of tackling just about any topic of conversation you can think of. Be cautious of his witty sarcasm or you might find yourself completely confused in conversation.

Now you're thinking: "What about his skills as an HTE student?" This question is easy, Maurits is a great student of technology. If he passes a course, he passes it well. The so-called "six culture" does not exist in his vocabulary. Furthermore, his knowledge is enriched with some profound experience at the Formula Student Team of Delft. All in all, Maurits is just a pretty good guy.

"Joy", "Urine", "Hans", all different names to get the attention from Jeroen Huisman, this year's secretary. He is in many ways different from the rest, for instance by being the only one not born in August, younger than 23 and the only one whose name doesn't start with an M. Jeroen is a quick learner, rather than a hard worker, which helped him get his bachelor in 3 after starting on his 17th. Apart from his flying career in at the TU he is all in for sports: football, cycling, formula 1, swimming and go-karting are mainly in his arsenal because he can practice at least three of these in his parents' back garden, but he probably knows a thing or two about other sports, too. His practical view must certainly come from his dad, who built an entire farm-size shed on his own, along with 80% of their house, so who knows one day Jeroen might build us a new Taylor office. Thanks to this energetic mentality Jeroen will be a great addition to the board and his wide sense of humor (including jokes about himself) will keep us going throughout the year!

I present: Michiel Jakob Zult, your new commissioner of internal affairs. Officially this means he will be responsible for maintaining the high quality of the courses; unofficially this means he will be watching bicycle racing every time it is on. All joking aside, Zult is a perfect fit for the Taylor board. He gets the work done, thinks outside the box and comes up with creative ideas while keeping the vibe relaxed all the way through. But he is the type of person you need to meet before you fully understand what's up. But nonetheless, here are some heads-up. His jokes are never-ending, unpredictable to a level that is almost scary and unique in a weird but good way. He wants to produce an album someday including, but not limited to, some rap songs. For that he needs some help finding a suitable stage name because his Dumpert username is not catching on, so don't hesitate to help out. His best move is 'the crane bird'; ask for a demonstration, it's enlightening. And last and certainly least, if Taylor doesn't work out, he is becoming a Michael Jackson impersonator. That's it! Definitely make sure you get to know him, it's worth it. We are glad to have him aboard and if you want to talk World of Warcraft with someone, he is your man!

Marc Gritter is the new treasurer for the Taylor board, he prepared in the best way possible for this position. He has seen all the important movies like Wolf of wall street, Inside job and The Big Short. So he knows how to use money wisely. Don't think that marc is the new treasurer just because the last treasurer was also called marc. This is just a very big coincidence and Marc was totally not pushed by everybody to take this position because it would be a perfect coincidence. Marc can't drink alcohol because he is way too cool for that. So you can always count on marc to think clear and make the right decisions during the monthly drinks. Treasurer is a key position in the Taylor board and the person holding this position should be able to be firm and say no to certain things which is why Marc will fit this job excellent, he is one of the most experienced guys at our office. You can always call Marc by his last name, gritter or a better variant of this, glitter.

To complete the Taylor Board, Meindert Ras will fulfill the position of External Affairs. Meindert has really grown up from a boy with a "Bieber" haircut to a serious student. Although studying is important, Meindert isn't scared of a party! He doesn't only show his skills at the bar, but also on the stage he is a maniac as a drummer. He plays in multiple bands and after some beer he will maybe even show some of his legendary dancing skills. Meindert is also a soccer player by heart, which he will be able to demonstrate in the brand new Taylor soccer team. After being born in a little town Urk, he immediately moved to Kyrgyzstan for ten years. He returned to the Netherlands when he was eleven, and ended up at the majestic PME master. These years abroad will be of immense help for this coming year as his function is the External Affairs. With his Christian upbringing and his motivated (and sometimes a bit obsessive) nature, the others of the Taylor board



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