

# Taylor Vision



Zoom in



## About us

### Board

Bas Roulaux - Chairman  
Emma Hoes - Secretary  
Guido Mous - Treasurer  
Lisanne Nijdam - Internal Affairs  
Joran van der Zwet - External Affairs

### Location

Dispuut Taylor  
Department Precision and  
Microsystems Engineering  
Mekelweg 2  
2628 CD Delft

### Contact

Tel: +31 (0) 15-2786850  
Email: [taylor-3me@tudelft.nl](mailto:taylor-3me@tudelft.nl)

### Edition

Spring edition, April 2020

### 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.

# Contents

---

From the board.....	4
Upcoming Activities .....	5
Recent graduates .....	6
PME News .....	8
Activities .....	9
Excursion: Huisman .....	9
Lunch lecture: Sioux .....	10
Case study: TNO .....	11
Ladies activity: High Tech Tea.....	14
Lunch lecture: Philips.....	15
Photo's New Year drinks.....	16
Sollicitation Taylor board.....	18
PME fight against Corona.....	19
Photo's Apres ski pubquiz drinks.....	20
Jorans Puzzle Paradise .....	21
Prodrive Football team.....	22
PME & Online contact.....	23

# From the board

---

Dear reader,

To put it mildly: it has been an irregular quarter. We kicked off in February with a couple of cool events and a whole bunch of fresh courses, but as we were rushing through this quarter, we were roughly interrupted by the coronavirus (you might have heard of it). So let me start with saying on behalf of the Taylor board: we hope that you and the people around you are in good health while you're reading this!

Due to the irregular situation, this edition of the Taylor Vision will be a bit different than you're used to. Many events have been cancelled, the Taylor football team has been sent home to stay fit and the mug mystery has been solved ages ago (new mysteries haven't come up yet).

Of course you can find a recap with pictures of past events, but we'll also take the opportunity to show some cool stuff that is going on around us and are realized by people who are doing their best to help in these crazy times.

We're glad that this peculiar edition of the Taylor Vision has found its way to you somehow, and we hope you enjoy reading it while killing your time in quarantine!

Stay healthy and cheers,

**Bas Roulaux**

# Upcoming Activities

---

Q3 promised to be a term packed with action and fun, but unfortunately most events had to be cancelled. Luckily this does not mean the year is all over! There will hopefully still be some events worth writing down in your calendar.

## **Master thesis market**

Students looking for a thesis project or supervisor are not left in the cold after cancellation of the master thesis market. The importance of finding an interesting project must not be underestimated, therefore the department is working hard to provide you with all the information needed. Take a look at their Brightspace page (ME56035) and organise your individual, remote master thesis market at home!

## **PME football tournament**

The PME football tournament was supposed to take place in May. The event can not be held as planned, but will be either postponed or held online. More information will follow shortly, so make sure to stay fit and keep working on your FIFA skills!

## **Pubquiz, April 30th**

After a successful edition during the après-ski drinks, it's time for another pubquiz! This time without physical attendance, but nonetheless brain-aching questions are guaranteed. Don't forget to BYOB and keep an eye on our website.

## **Connect**

Interested to find out about job opportunities in other places than the established Eindhoven-area? Taylor partnered up with YIN (Young Instrumental Network) to introduce you to companies affiliated with the west-Netherlands' high-tech platform; Holland Instrumentation. Expect to hear more about this; the event will be postponed, but certainly held next Academic year!

---

Emma Hoes

# Recent graduates

---

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



Bas Nederkoorn, MNE

*“Auxetic metamaterials for pressure to strain conversion”*

Casper Penning, DMN

*“Modelling viscoelasticity using Multifrequency AFM”*

Robbert Kleer, MSD

*“Predictable opto-mechanical design for a critical reflective surface”*

Vincent Bos, DMN

*“Nonlinear dynamics of graphene membranes”*

Stefan van den Toorn, MSD

*“Design of a ferrofluid linear long stroke stage”*

Ad Huisjes, MSD

*“The novel Compliant Manipulator Design Method”*

Suzanne van den Boogaart, MSD

*“Metrology design for improving the beam stability in an e-beam lithography machine”*

# Recent graduates

---

Floyd Versluis, MNE

*“Bottom-up manufacturing of nanocrystalline diamond micro structures and components”*

Maurits van den Hurk, MSD

*“Design of a novel thermocompression bonding module for high throughput flex-on-substrate assembly”*

Yi Song, SOM

*“Towards high-order discontinuity-enriched finite element methods”*

Nooshinossadat Mortazavi, DMN

*“Effect of instrumentation position and direction inaccuracy on the calculation of virtual point transformed FRFs”*

Robin Gomes, MSD

*“Design of a compliant hinge based on closed form pressure balancing”*

Chi Wai Kan, MSD

*“3DOF( $xy\theta$ ) measurement of a planar stage with one single 1D CCD from a 2D Moiré pattern”*

# PME News

---

In the previous Taylor Vision, we discussed the great news of the extra available positions within the department. This time we can bring you the delightful news that many applications were received and that those have lead to numerous interviews already. Some of the applicants came by to give a mini-lecture, which was very interesting for the students who attended to provide some feedback from their perspective. Unfortunately, due to the coronavirus most of the application processes have been paused until everybody has access to the university again; to be continued.

As we all have noticed, many other things at our university are also being cancelled due to the coronavirus. Many courses quickly switched to online education and use an online examination method to conclude this quarter. The department is working as hard as they can to come up with ways to still continue the courses according to schedule, with the expectation that lectures and exams will continue to be held online during the fourth quarter as well. Additionally, master students who are graduating are mostly working from home while keeping in touch with their professors online. Some experimental work can be done at the faculty, but this is also being kept to a minimum. We would like to thank all the employees, professors and students for adjusting this quickly to this bizarre situation, it clearly shows how inventive and resilient we can be in our awesome department!

Cheers and stay healthy,

---

Bas Roulaux



# Activities

---

## Excursion Huisman

On Wednesday the 8th of January we paid a visit with Taylor to the almost century old Huisman. Although originally a company specialised in steel constructions, they have now shifted their focus to the oil and gas industry, as well as renewables. For instance they make large cranes which are able to place windmills precisely while at sea.

At Huisman they were most eager to show us their multi-purpose tower, which is used as a show model for a completely automated drilling rig. The tower is situated on joints, which in combination with a gigantic moving weight is used to simulate the movement of the sea. With this show model they hope to convince customers of the potential of their innovations. According to Huisman the oil and gas sector is conservative when it comes to new innovations and they therefore have to resort to building a scale model to be able to sell their new products. One of the main reasons for the sector's conservativeness is the switch to renewable energy, luckily Huisman is not going to sit around and do nothing and they have started building the largest floating cranes capable of building the largest windmills. These cranes can place windmill foundations with millimetre accuracy using their Motion Compensated System.

To summarize it was a very interesting tour at Huisman, Although I was a little disappointed that they didn't turn on the simulated sea motion in the tower.

---

Roald Lingmont



## Lunch lecture Sioux

On January 15th, the first lunch lecture of 2020 was held. Wilbert Lommen, principle system designer mechanics, visited us on behalf of Sioux Technologies. The lunch lecture was well visited, all seats were taken and we had a nice free lunch to enjoy while learning about the projects and expertise within Sioux.

The lunch lecture started off with a slick company video, which briefly introduced us to several fields in which the company is active. Sioux is a rapidly growing company, with an annual increase in the number of employees of about 10% over recent years. The company has various different competences and departments, such as mechatronic systems and assembly departments. They work in a wide range of markets, ranging from medical to transport and automotive industry.

After this introduction, a timeline showed many different customers that Sioux worked with, amongst which were ASML, SKF, and a company called MSD, which may or may not have anything to do with our MSD specialization. Sioux did many projects involving flywheels, which are used in public transport, amongst others, as a storage of potential energy to drive the vehicles. Another project concerning energy harvesting was a project by the name of Hydroring, which is an alternative type of turbine, designed without a shaft.

The last part of the lecture was called the ‘story of nothing’, about a calibration tool used in a measurement setup to test mirrors for ASML’s lithography machines. Before going into further detail, mr. Lommen did a shout out to ASML, stating that Moore’s law was maintained mainly thanks to their constantly improving technology. The calibration tool is designed by Sioux in such a way that there is no dissipation, heat up or drift, neither is there any (significant) deformation of the mirror, hence the title ‘story of nothing’. Many aspects of High Tech Engineering were recognizable in the details of this design, including mechatronics, vibrations and finite element analysis. Altogether, the tool achieves stability in the order of picometers in all positions of the mirror, a remarkable feat of engineering!

I personally really enjoyed the presentation and to me it came across as a very nice place to work, with sufficient freedom and plenty of possibilities to develop yourself. Best of all, at the end of the lecture we went home with a Sioux branded pizza cutter.



---

Daan van der Lans

# Activities

---

## Case study TNO

The challenge of pointing lasers for internet reaching anywhere.

How could you create a superfast internet connection on my cruise ship in order to let all people stream movies at the same time? This client question was leading the case with TNO and Taylor students on Tuesday february 11th. The expertise of TNO in the field of optomechatronics is contributing to the development of laser satellite communication with the secure potential of 10-100 times faster internet.

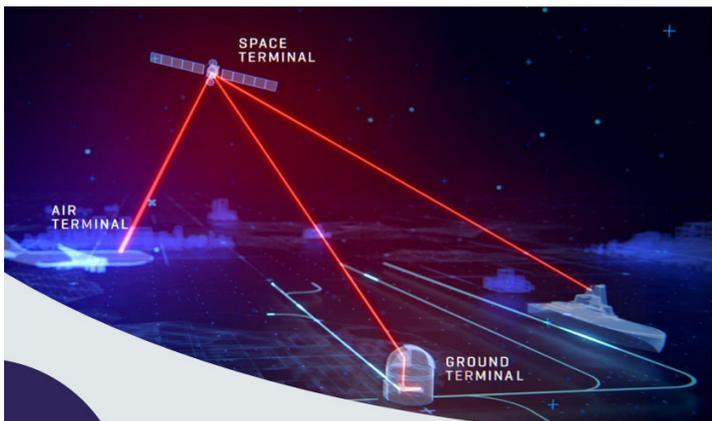
After an introduction by Bart van de Laar and his colleague of the cyber department, they guided us to tackle the case approaching the client question to create an internet connection on board of a cruise ship using laser communication with a satellite. Each group member was assigned a role of an expert, project manager or system engineer including extra information kept secret per role. Within half an hour we prepared a presentation about our approach touching upon understanding the question, the motivation of the project, defining the system, questioning feasibility of the solution and thinking about several technical implications ranging from thermal to dynamic aspects. In the end, the laser should be able to point from here in Delft on an envelope in Shanghai.

In this interactive case we discovered the interesting work with many unknowns in a futuristic and newly developed field and practised creative thinking in technical range, while keeping the agenda of your role in mind. We are curious about the opportunities of 1 terabyte per second of internet speed.

Keep discovering? The TNO optolab is right at the Stieltjesweg on our TU Delft campus or read further on [www.tno.nl/en/focus-areas/industry/expertise-groups/optomechatronics/](http://www.tno.nl/en/focus-areas/industry/expertise-groups/optomechatronics/).

---

Matthijs van Reeuwijk





# HEIDENHAIN



## Exposed Linear Encoders for Permanently Stable Measured Values

Machines in electronics manufacturing, in high-level automation, or medical technology need to position finely, quickly and exactly. Exposed linear encoders from HEIDENHAIN are used exactly wherever there is a need for positioning with extremely high accuracy or for precisely defined movements. Even if the encoder is subjected to contamination, the scanning signals stay lastingly stable. This is ensured by the new HEIDENHAIN signal processing ASIC, which almost completely compensates signal changes caused by contamination and maintains the encoder's original signal quality. And this without any significant increase in the noise component or interpolation error of the scanning signals, so the control loop receives highly accurate absolute or incremental position information permanently and reliably.

HEIDENHAIN NEDERLAND B.V. 6716 BM Ede, Netherlands Phone 0318-581800 [www.heidenhain.nl](http://www.heidenhain.nl)

Angle Encoders + Linear Encoders + Contouring Controls + Digital Readouts + Length Gauges + Rotary Encoders



# SIGMATEK

- wireless multi-touch besturings paneel
- noodstop (25m!) met oplichtende status indicator, bevestiging button en key switch, SIL3/PLe
- rotary encoders
- safety over wlan
- OPC UA



**TÜV**  
AUSTRIA



[www.sigmacontrol.eu](http://www.sigmacontrol.eu)

powered by

**Sigma**  
**Control**

# Activities

## Ladies activity: High Tech Tea

Home made cakes, lots of chocolate, more than enough tea, quiche and lots of sweet snacks, all ingredients for a delicious high tea! After the success of last year's edition, the High Tea for the ladies of the department of PME was organized again. A chance to connect with other females in this male dominated technical world. We are not going to tell you who of the female staff skydives often, who is a life coach next to her job at the department and who of the students plays in a band. If you weren't there, big chance you're a male, so keep puzzling who's a great artist and who has eaten the most 'tompoezen'!

Lisanne Nijdam

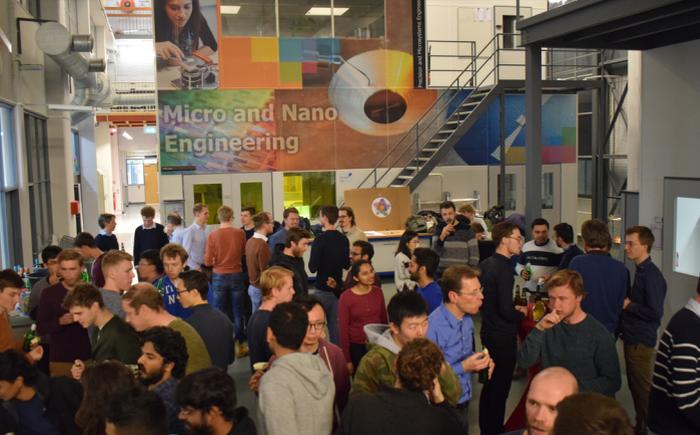


## Lunchlecture Philips

On February the 21st Philips employee Dennis Bruijnen came to Delft in order to excite people for his company. Dennis, a former TU Eindhoven student is a senior technologist and competence leader at Philips working in the R&D department. This department does a lot of work for their well-known company but also provide R&D services for other companies. Their main goal is to turn great ideas into meaningful innovations. They are active wide range of sectors from medical innovations to innovations for ASML. Dennis himself however seemed to be quite into control for different kind of systems like robotics and precision engineering. By first giving an introduction into the different kinds of control using an simple analogy of hitting a target he presented the different projects they have been working on. The idea I myself found the coolest was the control of a Maglev mover plate which had no contact wires and used Hall sensors to determine its position. After this Dennis presented the software it became apparent that he actually was a (silent) celebrity: he turned out to have made the Shapelt matlab tool. This tool is actually utilized by the majority of HTE students. Also Dennis explained about the well known robot soccer team and the control loop optimization of this team and the challenges its advancements bring. Now the most Philips like project came along: the IGT, an image guided therapy device which allows 3d x-ray construction in a safe way. This very cool looking device however brought lots of challenges in terms of control due to vibrations. Finally, Dennis stressed the perks of working at Philips like deepening technical knowledge after which the presentation was closed by the board presenting a very tasteful bottle of Taylor Port.

Thijs Bieling





We bring **high-tech** to life

## Are you in?

We are looking for talent in:

- Software
- Mathware
- Mechatronics
- Electronics
- Automotive
- Mechanics

# Chairman

Be a leader and guide your board towards reaching your common goals!



# Secretary

Be the right hand of the chairman and guide the daily operations of the board!



# Treasurer

Be responsible for working with a fair amount of money and approvals of several activities!



# External affairs

Be the link between companies and the board, and maintain contact with current sponsors!



# Internal affairs

Be responsible for the communication with professors and help to improve the current education!



# Join the Taylor Board!

Be part of an amazing group of motivated people who will work together to better the life of a new master student!

If interested, contact one of us and we can make this amazing opportunity happen!

Time to make your dream come true, Taylor is looking for a new board!

A few practical details:

- Duration: September 2020 to September 2021
- Time required: On average 6-8 hours a week, including board meetings.
- Points of interest: Fun, teamwork, organization skills, contact with companies, PME department, your own office and free coffee, Taylor Trip and much more!
- Application deadline: TBD

As a board member, you are responsible for the day-to-day operation of Taylor. This means organizing the regular activities, maintaining contact with industry and the department, and of course organizing a great Taylor Trip. During your year, you will learn a lot about organization, management and the PME-department. You will get the opportunity to broaden your network by being in close contact with the high-tech industry and the professors of our department, both being a great boost for your future career. Last but not least, you will have a great year with tons of fun with your fellow board members!

If you're keen to enjoy a year of free coffee, have a daily chat with Eveline and come up with ever better puns on Taylor-Drinks-posters: send an email to [taylor-3me@tudelft.nl](mailto:taylor-3me@tudelft.nl), contact us on Whatsapp or let us know in person!

## The fight against corona

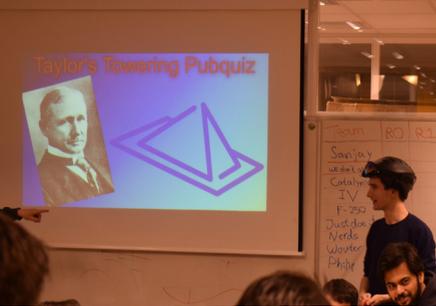
An ex-flat mate and I came up with the idea! It all started with an Excel sheet! We wanted to properly visualize/manipulate the data to our likings and make conclusions based on the graphs, instead of blindly listening to what people state on the news. Then the idea for turning it into a website arose, because why keep this interesting data to yourself, while you can share it with others? The lay-out has been chosen for a dashboard representation, where graphs are shown neatly under one another. There's very little text, only a short Dutch description under each figure, which may be opened by clicking the information buttons. This way, the page is clear and easy to analyze. We intend to add more data, so keep an eye on the page on the daily! [coronastatistiek.nl](http://coronastatistiek.nl)

---

Timothy Kramer

Other HTE students are working on projects at the university to make a ventilator. For this edition of the Vision they were not allowed to show us the insides of their project. So, keep an eye on next Vision, maybe you find their experience of there project in next edition.

Also for other projects, are you or do you know students/staff that are doing something amazing to fight corona, let us know and we will put them in the next Vision spotlights!



# Jorans Puzzle Paradise

---

Right it's time for another puzzle after the great success of the last one. This one is a binary puzzle with the following rules:

1. Every cell must be filled in with either a 1 or a 0
2. No more than two of the same number are allowed to be below or beside each other (so diagonally this is allowed)
3. Every column and row must have an equal amount of 1s and 0s
4. Every column and row are unique, meaning that for every column there is no other column with that configuration and for every row there is no other row with that configuration.

With these simple rules you should be able to complete the puzzle below, good luck!

	<b>0</b>						<b>1</b>	<b>1</b>	
<b>1</b>							<b>1</b>		
<b>1</b>					<b>0</b>				
		<b>0</b>				<b>1</b>			
								<b>1</b>	
<b>1</b>	<b>1</b>		<b>0</b>		<b>1</b>		<b>0</b>		
									<b>0</b>
	<b>0</b>	<b>0</b>						<b>0</b>	
	<b>1</b>				<b>1</b>				

*Mail [taylor-3me@tudelft.nl](mailto:taylor-3me@tudelft.nl) with your solution to win a prize!*

# Prodrive football team



The first quarter was about getting used to the tactics and finding the ideal line-up. In the second quarter it was time to reap the harvest, as results were expected by our demanding fans, head sponsor and department. From the numerous tactics tried, the 4-1-1 with upcoming backs and fast counter football was found to be the tactic that suited us the most. This also led to good teamplay, attractive football and some very nice tiki-taka goals, making us end high up in the (right half) of the competition table.

---

Guido Mous

# PME & online contact

Skyping with your project group, Zooming your lecture, Discord to see literature presentations and Houseparty in between with your friends of PME? Show us the most creative group picture with a group of PME staff/students. Will SOM take the challenge at their weekly Friday afternoon drinks? Or maybe it is a good activity for the first meeting with your PMD project group and test your teamwork. One thing I know, you should be better than we are. Our attempts to make a picture including a cycle with random placing of the camera images was a challenge...

Mail your picture to: [taylor-3me@tudelft.nl](mailto:taylor-3me@tudelft.nl)



