

S T U D Y A S S O C I A T I O N

G E W I S

 **SUPREMUM**

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 **SUPREMUM**  
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THE  
COURAGE  
EDITION

**THE  
BRILLIANCE  
EDITION**



# EDITORIAL

EDITOR IN CHIEF Anne Nijsten

After passion and courage, we now finally bring the brilliance edition to you (although with some delay.) Together, these themes are also found in the Wizard of Oz movie: the Tin Man, Cowardly Lion and Scarecrow go looking for these virtues. For them, after traveling along the yellow brick road, it becomes clear how they already possess these qualities. For us, it may be a completely different journey that we need to discover our qualities. Whereas that may be somewhere at in a room at the university, during a walk in the park, in the kitchen of your student house or somewhere else, no one knows.

My time studying at our department has trained my brain to handle some challenging problems, the shyness of the first-year version of myself has largely been replaced by confidence, and for this edition I will share some of my passion for origami on the following pages. Now, after more than 5 years with the Supremum committee, it is time for me to continue my journey with my graduation and everything that may come after.

In this edition, some of our fellow students will also share their view on brilliance and how to grow yours, for example by giving some nice references to visit or giving you some food for thought.

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# CHAIR'S NOTE

**W**hat makes a person brilliant? Walking around university we are surrounded by people who are good at studying and smart. But brilliance takes something more than being smart, it's also about having new ideas, maybe even changing the world with your perspective on it. True brilliance might only be reserved for a few great thinkers. Einstein might come to your mind, or Euler or Turing. All of these scientists truly left their mark within their field. When we get taught about history we often hear the stories of brilliant people. Often the people we hear stories about are men. The amount of male stories we get told when we are young almost makes you believe that women didn't even exist in the good old days, or they just stayed at home, you know: birthing kids, cooking, and cleaning. There are so many brilliant women in history, however, often their stories do not get told.

TEXT Sanne de Wit

In the English language, the word 'man' can be used both when talking about the entire human race, or to refer to a person who is a man. This has all sorts of consequences, including that when a person's gender is not specified in a story, we assume that they are a man. A scientist is a man, a female scientist is a woman. This man-unless-otherwise-stated is everywhere in our culture. It even applies to bones. About a decade ago a Viking skeleton was found, it was nicknamed 'Birka's warrior'. It was easy to see that this skeleton was a warrior, since it was buried next to all kinds of weapons and two sacrificed horses. Since this skeleton was a warrior, it was also assumed to be the remains of a man, although that hipbone did look suspiciously female. When the DNA of Birka's warrior was tested, it was indeed confirmed to be the skeleton of a woman. Even then, the conclusion still wasn't that it must have been a female warrior. Archeologists pitched all kinds of theories to explain the mysterious female warrior. Maybe the bones got mixed up, or there was some other reason a woman got buried with all these weapons. Of course, a scientist should always be critical when making conclusions, but when a male skeleton is found near weapons, it is never under this sort of scrutiny.

**“ Since this skeleton was a warrior, it was also assumed to be the remains of a man, although that hipbone did look suspiciously female. ”**

Then in more recent history, we also hear fewer stories about women. "That's logical", some might argue, since society back then was more sexist than it is now and women just didn't have the opportunity to make interesting stories, which is why we don't hear about them. However, this is not the complete truth. Often the work of women was falsely attributed to their brothers or husbands, since people simply found the work 'too good to be from the hands of a woman'. A well-known example of this is Rosalind Franklin. James Watson and Francis Crick have been deemed the discoverers of DNA, but this discovery mainly was based on Franklin's conclusion that DNA exists out of two chains and a phosphate backbone. Barbara Strozzi was a composer in the seventeenth century, she was alive at the same time as Francesco Cavalli. During

her life, Strozzi's work was printed more than that of Cavalli. However, Cavalli got a well-paying position at the San Marco of Venice, a position women could not fulfill at those times. With his big salary, Cavalli paid for all of his work to be stored in libraries, an archivist to make sure all his work was stored correctly, he even set aside money such that each year at his death anniversary one of his works was sung. Strozzi didn't have the means to make sure she would be remembered after her death, and with that, she wasn't.

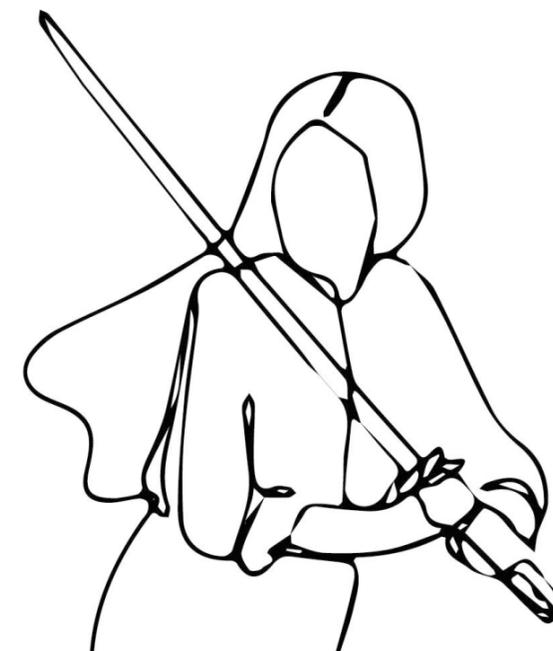
I could probably fill up a whole edition of *Supremum* with stories about interesting women who left their mark on the world, but for now, I will tell you one last story. This is a summary of the life of Julie d'Aubigny, also known as Mademoiselle Maupin, or La Maupin, who lived from 1670 till 1707. This bisexual, sword-fighting opera singer had been through quite a lot. While she was in an arranged marriage with Sieur de Maupin, she had a lover, Sérannes, who was wanted for murder. The couple decided to flee to Marseille. While on the run, Julie made a living by performing fencing shows and singing opera. All of this time, Julie wore men's clothing, while not concealing her gender. Arriving in Marseille, Julie and Sérannes broke up, and Julie got in a relationship with a young woman. Her parents sent Julie's love interest to a nunnery, so,

to be together with her, Julie also joined the nunnery. In the nunnery, she stole the body of a dead nun, put this body in the room of her lover, and lit the room on fire, such that they could escape together.

Later she was working as an opera singer, making her debut as Pallas Athena in *Cadmus et Hermione*. However, her career was halted when she publicly kissed a woman at a ball. Being banned from working was not the only result of her sapphic kiss, she was also challenged to a sword-fighting duel by three different men. She, like the badass that she was, beat all of them. She then started a third flee, this time towards Paris, as the King had forbidden duels. She worked as an opera singer for a few more years, after which she fled to a nunnery where she eventually died.

I hope that these stories about interesting women from history have inspired you to look up some more stories. The next time you have a conversation about history, at least ask yourself the question what the women were doing during this time.

*This article was mainly inspired by the book *Invisible Women* by Caroline Criado Perez.*



# EDUCATION FIRST

One day when Piglet was busy with snow clearing, he saw Winnie the Pooh, who was walking in circles clearly somewhere else with his mind. "Hey!" Piglet shouted, "What are you doing?". "I'm hunting," Pooh answered. "Hunting? On what?". "I'm following a track," Pooh said very suspiciously. Piglet came a little closer. "A track of what?". "That's exactly what I'm asking myself." "Do you already know what you are going to answer yourself?" "No, I can do that once I'm done following this track." Our scared little Piglet is afraid the track might be from a very dangerous Woozle. Despite being afraid, he helps Pooh with hunting the Woozle and together they are following the track. Only to see that there is not only a track from a Woozle anymore, but a new track has appeared. Maybe that one is from a Wizzle?

TEXT Anne van den Elzen

This is a part of a story from the Winnie the Pooh book from A.A. Milne. When reading this, we all know that these tracks are not from a Woozle, not even from a Wizzle, but from Pooh and Piglet! After some help from Christopher Robinson, Pooh also came to this conclusion. "I'm so stupid! I'm a bear with no brains," Pooh said sadly and disappointed in himself. "You are the best bear in the whole world," Christopher Robinson said. "Really?" Pooh asked with hope and all of a sudden he was full of happiness again. "Well, well, then it's time for a bite of something" and he walked home.

This might not sound very bright from our lovely friends Piglet and Pooh. Spending a whole day following your own tracks and being afraid of a made up creature. Well, I won't argue with you that this might not be the most productive way to spend your day. But still, I think that both Piglet and Pooh are very brave and bright creatures and that you can also see this in the short story above. Let me explain.

“ Spending a whole day following your own tracks might not be the most productive ”

Piglet is a small pig and gets stressed out easily. Every small setback is already a heavy burden to bear for this small creature. However, despite the great amount of fear in his little body, he still does it anyway; he helps his friend. When we think of bravery, we often think of heroic acts that blow your mind, but everyone has their own comfort zone and boundaries. Stepping out of those and doing something YOU are afraid of, is also brave.

Pooh, who started with following his own tracks, felt very stupid once he found out what he was doing all day. His confidence went real down for a moment and, to be honest, it is very reasonable that you feel down once you find out that you did something incredibly stupid. We all do and it takes courage to overcome this and go on with your life. Feeling down won't help you. Picking yourself up like Pooh did takes courage and knowing that feeling down won't help is very bright.

Being bright and brave is something you define yourself. If even Pooh and Piglet are bright and brave, then so are you!

*Infimum: A strange or funny quotation from a teacher, a student or faculty member. Here you can find infima sent to the Supremum committee via [inf.gewis.nl](http://inf.gewis.nl).*

**Gielsing:** "De zondagochtend dienst is veel draaglijker met een halve liter Weizen in je hand, toch?"

**Sanne tegen Leon:** "Ik wil niet dat je me aanraakt met die gore slang!"

**Sanne in de FEBO:** "Dit is niet de gaybar, dit is de FEBO!"

**Leon:** "Ik drink kachels..."

**Bartjan:** "Twee woorden, 9 letters. Cocktails zui... oh wacht."

**René:** "Die plantjes krijgen sowieso water nu."

**Roy:** "Ze zijn van plastic."

**Jeffry:** "Waarom heb je zo'n koude handen."

**Lieke:** "Ik ben vrouw!"

**Bartjan op ATHENA-weekend omringd door cocktails:** "Ik had natuurlijk ook gewoon een frisje kunnen drinken."

**Ober:** "En nog een cola."

**Bartjan:** "Ja voor mij, ik ben hier de kleuter."

**Sabine over Jeffry:** "Ja, jij ziet hem van de voorkant en ik van de zijkant. Welk aanzicht is beter?"

**Noa:** "Geen."

**Noa:** "Ik moet pissen."

**Leon:** "Als ik zo op je buik duw moet je nog meer pissen."

**Noa:** "Nee dan komt er een kind uit."

**Lieke J.:** "Zwolle?????"

**Bouke:** "Suus... Suus!... SUUS!"

**Ronnie:** "Dat is Anne!"

**Bouke:** "Sorry, ik zie geen kleur."

**Victor:** "Hoe heet die reis die moslims naar Mekka maken?"

**Lotte:** "Couscous"

**Ivo tegen Alexandra:** "Heb jij ook een broer of zus meegenomen?"

**Alexandra:** "Ja mijn broer, hij heet Jindra, dat is Tsjechisch."

**Ivo:** "Maar spreekt hij wel Nederlands?"

**Tessa:** "Ik vind Jelte wel een puntkomma."

*\*Sabine probeert iemand te koppelen aan Evie\**

**Sabine:** "Hoi, dit is Robin."

**Evie:** "Hoi, dit is een misverstand!"

**Sanne tegen Lieke:** "Toen ik een goede indruk probeerde te maken op je ouders, ben ik netjes met mijn rug naar ze toen gaan staan om een adt te trekken."

**Bartjan:** "Hij heeft een of andere afscheidsfissa."

**Leon:** "Een begrafenis?"

**Lucas tijdens Intro beunmoment:** "Daan kan zijn eigen stropdas niet knopen. Ik ben pas 3 jaar een jongen en zelfs ik kan het!"

*\*Arend en Lucas rijden weg van een kruispunt\**

**Arend:** "Ik vind het grappig hoe wij allebei geen aanstalten maakten om te stoppen."

**Lucas:** "Waarom zouden we stoppen?"

**Arend:** "Het was rood."

**Lucas:** "Hu?"

**Sanne:** "Als ik het er niet mee eens ben, dan haal ik het weg. Als ik het er wel mee eens ben, dan laat ik het staan."

**Tessa tegen Jelte:** "Soms vraag ik me wel eens af, ben jij wel helemaal honderd?"



4 Chaos

# A ROMANIAN IN THE NETHERLANDS

**H**i everyone! I'm Bianca and here is my experience as an international student from Romania! I admit that, at first, the thought of moving to the Netherlands for university was scary. So scary that I was close to not even applying, but shoutout to my parents for convincing me. That was more because I had no idea what to expect from this country, but I am now confident I have made the right decision. If someone asks, I will hype up the Netherlands more than any Dutch person ever could!

TEXT Bianca Eni

My student life here started with the Intro Week and it was a bit of a culture shock (and not just from hearing Dutch people pronounce the letter 'g'). On the first morning that I stepped foot on campus, everything felt overwhelmingly big and foreign. Then I arrived at the field near Traverse and saw people casually sitting on the grass, soaking up the sun. I can't explain my excitement right there and then (without sounding incredibly silly). Romania is a great place to live, but I never felt such a sense of community and easygoingness with people at home. And so, things only started getting better from there.

**“ On the first morning that I stepped foot on campus, everything felt overwhelmingly big and foreign ”**

From different posts I read on the internet before moving, I was left with the impression that making friends in the Netherlands is difficult, but in my experience, that couldn't have been further from the truth. As a former self-appointed introvert, I can say the friendliness of everyone here has made me quite the extrovert now, in the span of just a few months. Joining GEWIS was a stepping stone into my now 'gezellige' social life. First-year committees are a great

way to make friends with like-minded people. Everyone is just as excited to socialize and have fun together, so friendships are forged in a pretty organic way. Speaking of meeting new people... being a Romanian in Eindhoven is definitely not unique. I think I lost count of how many times I got this exact reply after introducing myself to someone: "Oh yes, there are a lot of Romanians here!". Maybe I should start keeping count for the fun of it though! Therefore, with so many of us here, I would have thought Romanians would comprise most of my friend circle. Imagine my surprise when I found myself surrounded almost completely by other nationalities. I believe that interacting with such a diverse range of people pulled me out of my comfort zone, all for the better.

After making so many friends, it is only natural that we go to parties together. The party scene here in Eindhoven is different from what I was used to back home. I have never encountered the idea of a 'borrel' before. I also knew the Dutch love beer, but never considered just how much. Don't get me wrong, beer is a pretty big deal in Romania as well, but it has never appealed to me. I even swore I would never drink it! Well, some months in the Netherlands were all it took for me to start liking this peculiar drink! After borrels, I have also experienced the tradition of going to Stratum for even more fun. My favorite places must be the karaoke bar Ameezing and the Silent Disco. But going out is not everything. It is nice to know that

someone is always up for hanging out after a tedious week of courses. This free time could be anything from getting a coffee, going to a spinning class, playing board games or organizing an Uno tournament in your kitchen.

Now let's talk about a very vital topic, and that is food. What I miss dearly about home (besides my family, of course) is the food. I'm not going to lie, despite my initial doubts, frikandelbroodjes are tasty (although I still don't fully trust them), hagelslag is quite a delicious snack and eating sandwiches for lunch is much easier than cooking soup. But when I went home for the holidays, I explicitly requested some 'ciorbă' and 'sarmale' to compensate for my new Dutch student diet.

**“ It feels incredible how easily I adapted to this new environment and culture ”**

However, there is one thing about this country that I wouldn't trade for anything! One of my biggest gripes

about my hometown was the lack of travel accessibility. Traveling is tricky when the closest airport is four hours away by car, or simply crossing Romania takes at least ten hours. But by living in Eindhoven, everything is closer than ever. Since the start of the year, I have gathered the best travel buddies. Together we have been all over the Netherlands, Belgium, and even Germany! It is amazing that I can hop on any train and, in just a few hours, be in a completely different location. The tickets are not the cheapest, but now I have invested in an NS subscription that gives me a lot of discounts during the weekend. It's totally worth it!

It still feels incredible how easily I adapted to this new environment and culture. The university years are some of the most precious. We have to make the most out of them. However, this only happens with an open mindset and taking up the reins in your own life. So for anyone reading this who still struggles with being an international here, this is my advice: join that association, pursue that hobby, talk to the person sitting next to you in the lecture, and don't be afraid of opening up to new experiences!



# SINGULAR VALUE DECOMPOSITION

## THE MYSTIC ART OF MACHINE LEARNING

This article highlights Zecheng's undergraduate honors thesis on singular value decomposition and its applications and it covers the problem of handwritten digit recognition. The discussed topic can be fully realized and understood by a STEM student with basic knowledge of linear algebra and a good grasp of how the singular value decomposition works. It is perhaps the simplest algorithm that captures the essence of modern and sophisticated machine and deep learning architectures.

TEXT Zecheng Kuang, University of California San Diego

The general idea behind using SVD to classify handwritten digits is that for any given matrix  $M$  and its associated singular value decomposition,  $U\Sigma V^*$  (where  $*$  denotes the transpose of the matrix), a subset of the columns of  $U$  form an orthonormal basis of the column space of  $M$ . In fact, we need to select the first  $r$  columns of  $U$ , where  $r$  represents the rank of the original matrix  $M$ . This allows us to calculate a "digit space" for any number of digits that are classified as number  $i$  ( $i$  taking values from 0 to 9) and this framework can be used as our "recognition system".

“ Singular value decomposition (SVD) was the starting point that sparked my interest in machine learning ”

Suppose we have a set of  $k$  training images that have been classified as digit  $i$ . We vectorize each image, meaning that if the image consists of  $n \times m$  pixels then we construct an  $(n \times m) \times 1$  column vector. We collect all  $k$  images in a  $(n \times m) \times k$  matrix which will be our matrix  $M$ . We calculate the SVD of  $M$  and then upon examining matrix  $U$ , we determine the "digit space" for each digit as explained in the previous paragraph. Now we need to repeat this process and calculate the digit space for all ten digits.

$$M = U \Sigma V^*$$

This is all the pre-processing and training we have to do. Given an unknown image of a digit, we first vectorize it and get vector  $q$ . In order to classify this unknown digit we have to calculate the distance between  $q$  and the projection of  $q$  to all the digit spaces. Minimizing this distance answers the question of what digit the given, unknown image represents.

MATLAB code and functions can be found in Zecheng's thesis for further experimentation. [0](#)

MNIST pre-classified training images were used as a test dataset to construct the recognition system.

[0](#)

[https://mathematics.ucsd.edu/sites/math.ucsd.edu/files/undergrad/honors-program/honors-theses/2017-2018/Zecheng-Kuang\\_Honors-Thesis.pdf](https://mathematics.ucsd.edu/sites/math.ucsd.edu/files/undergrad/honors-program/honors-theses/2017-2018/Zecheng-Kuang_Honors-Thesis.pdf)



# LIFE AS A PHD STUDENT

Dear readers, my name is Céline Swennenhuis and I'm a PhD student in my fourth and final year. In this article, I will tell you more about my choice to become a PhD student, why I enjoy being a PhD student and why you might consider it as well.

TEXT Céline Swennenhuis

I studied Applied Mathematics in Delft, where I finished both my Bachelor's and Master's degree. You might not expect it, but I was not the top student during my Bachelor's. For example, I received 30 out of 60 ECTS in my first year, was terrible at analysis and I still tremble at the sight of differential equations. This slowly changed over the years, mostly because one can pick the topics of some courses as you get further in your studies. As a mathematician, you learn to be an expert at proving and being precise. This gave me the advantage in courses in theoretical computer science. Once such course is Automata, Languages and Computability, where you learn what Turing Machines are, why they are central in complexity theory, and (the harder part for most) how to reduce problems to each other. Thanks to these electives, I started to enjoy studying more and found some new confidence; at least I was good at *something*.

“ To be a good researcher, it is therefore just as important to be creative and independent. ”

Only after a handful of teachers asked me whether I wanted to become a PhD student, I started to consider it. At that time, I still considered myself an average student. However, the ideas that researchers come up with are called **brilliant** because the knowledge is new!

To be a good researcher, it is therefore just as important to be creative and independent. When I really enjoyed my Master project, I thought: why not give it a try? If I don't like it, I can always go look for another job.

I never regretted that decision. There are many advantages to this job; the pay is good, I can travel to conferences all over the world, I can select my own projects that I want to work on, I can choose who I want to work with, I can often take a day off when the weather is nice, and I am able to teach my humble knowledge to students like you! I will not say it is a walk in the park, especially mentally. There are many people around you that are good at what they're doing (hence, why they're there). That can be intimidating at times, and you might start questioning whether you are worth it, smart enough, or if you should work even harder. The challenge of doing a PhD for most people lies there; staying positive, having faith in yourself, and trying not to get overworked.

So should you go for a PhD? Who knows! But why not at least consider it? If you have some questions related to this article, my research or even something completely different, you can always reach me. I wish you all a great summer and maybe I'll see you at GEWIS, or who knows, even in class!



# CELERIT

## REALIZING SNIC2022



Reading the title, you may be wondering if these words actually exist. So allow me to explain them first for a minute. SNIC stands for "Stichting Nationaal Informatica Congres" (Foundation National Informatics Congress), which is a collaboration between approximately a dozen study associations, much like GEWIS, in the field of Computer Science, Informatics and Artificial Intelligence. Every year one of these associations is elected to organize a fully fledged out edition of SNIC!

TEXT SNiC committee 2022

The SNIC congress itself takes place yearly in November, in a different city every year. It attracts hundreds of students from all throughout the country. It's a single-day event where lots of speakers come and give an interesting talk about state-of-the-art technology or practices in the aforementioned fields. Not only is the day filled with exciting presentations about innovation, during the breaks and after the event you're also able to have a chat with any of the participating companies of the congress. They can tell you a lot about career-related questions and projects that their companies are currently working on related to the themes of the congress. In short, a truly informative, interesting and useful yearly experience!

## GEWIS' 2022 EDITION

As an association, we are currently looking back on last year's wonderful edition in November; MobilIT (see picture). However, as the title may suggest, it is now GEWIS' turn to realize this inspiring congress! What started out with the presentation of a so-called bid (a rough synopsis of a potentially upcoming congress' theme), made by a group of enthusiastic SNIC-committee-members-to-be is now gradually becoming reality. For the first time in five years our association has been granted permission by the

foundation to realize 2022's version of the SNIC. Since mid-April last year we've been officially established and have been hard at work formulating ideas, contacting companies, creating our corporate identity and contacting interesting people that fit our vision for this year's SNIC.

So what might this year's theme be? I'm glad you asked, but as you may have guessed from the title of this very article our chosen theme is: CelerIT. As it may not be very obvious, CelerIT (pronounced Celer - IT) is a play on the word Celerity, which in turn is not a very common word. The word can be described as meaning the swiftness of motion. We have chosen to translate this definition into an interpretation that is applicable to our field of science. Our congress will be all about the bigger picture of how fast technology has been, and still is, evolving. In other words, the swiftness of the rise and fall of technological developments in these fields, where we look both at what has been, the present and what's still to come.

## AN IMPRESSION OF CELERIT

To give you a taste of what to expect this November, allow me to introduce just a small handful of speakers and their to be presented subjects at our congress.

- » One of our speakers, Philippe Schoonejans, is a project manager at human and robotic exploration for ESA (the European Space Agency). After decades of experience he is currently helping develop a space arm for sampling material from Mars.
- » Another innovative researcher, Amanda Prorok, works in the field of multi-agent and multi-robot systems. Her lab's research team focuses on finding new ways to coordinate artificially intelligent agents. This involves a very methodological approach to solving many-faceted logistical challenges and has numerous applications to real world systems.
- » Kubernetes is an open-source system for automating deployment, scaling and management of containerized applications. It deals with complex distribution and problem-solves at large scale, for among others, production workloads at Google.
- » You may have heard of a YouTube channel by the name of 3Blue1Brown. They explore challenging (sometimes mind-boggling) problems in mathematics and adjacent fields and present them in a format such that they can be comprehended with little to no prior knowledge, while still diving deep into their complexity in a very enticing presenting style.

We're very excited to see what these interesting speakers, among many others, will bring to the congress. Together they will represent some of the tracks we have laid out throughout the day. Aside from

speakers you can also expect some alternative interactive ways to engage with these topics! Additionally, a substantial part of the congress is of course the dozens of companies that are present at the congress, just to chat with its participants. Engaging with these companies about on-going projects, career opportunities and what they're all about is a very valuable experience for participating students.

Hopefully this has given you some idea of the creative minds present and the content of SNIC 2022: CelerIT. You can find more information on participating at your local study association. We hope to see you at the Parktheater in Eindhoven on the 30th November of 2022!

Until then,  
The SNIC committee of 2022  
*Susan van Ewijk*  
*Wouter van Hoof*  
*Leon Vreling*  
*Irne Verwijst*  
*Roy Kakkenberg*  
*Wouter van der Heijden*  
*Samuel Oosterholt*  
*Sanne de Wit*



# ZEBRA

*For a long time, humanity has struggled with a very specific question. Many of you have probably also asked yourself this question, but have yet to find an answer. A question so hard that none of our exams even come close to this level: are Zebras black with white stripes or vice versa?*

**TEXT** Randy van der Steenhoven

Today is the day that we, from Zebra, will bring you clarity and finally give you true insight in what a Zebra is. This question is more complex than one might expect. However, as Zebras are thought to be only black and white (or white and black?). Being a Zebra is much more than that! Zebra is currently a group of friends within GEWIS that would like to become more active members, preferably as a group.

Zebra stands for the inner, sometimes yet to be discovered, creative engineer that houses deep within all of us. Mathematics and Computer Science are often seen as very static and sometimes even boring sciences by the outside world. What is often overlooked however, is that for these sciences a lot of creativity is required. We're all studying to become engineers some day after all! Don't get us wrong however. Zebra standing for creativity does not mean that we solely target arts and crafts. We would like to show you that creativity is more than following a Bob Ross tutorial, even though this could for sure make a great evening. To put it simply, we like to use our insight not only in



proofs or software, but also when using our hands. We would like to organize activities for us GEWIS'ers that will put our creativity to the test in different fields than the aforementioned ones. We will allow members to comfortably learn both useful and non-useful new skills or simply to have fun while creating something. Such things could range from calmly following a tutorial to having a fierce building competition between each other to determine who will be crowned the ultimate winner. Our activities could include festivities, the seasons and just general topics and therefore guarantee fun the whole year round.

Our idea began on one of the first borrels this year, when we all shared the feeling of wanting to become more within GEWIS. Many of us wanted to become a member of a committee or fraternity, but we all shared the same struggles of not really identifying with any of the existing ones. This is when we started talking about what we could mean for our association as a group and here arose the idea of forming a group, aspiring to become more in the future than just a group of friends. For now, we would like to make ourselves better known among the members and organize some activities to really create an identity and maybe one day we could become a fraternity ourselves!

For now, we have to make things Mexican and wrap this up. We look forward to meeting you during any of our activities, the borrels or any of the breaks in our beautiful Dakterras.

We hope you join our safari!

# SENSUS

*Hey! I am Roy, a bachelor's student in Computer Science and as an extracurricular activity I was part of the events department within the SensUs Organization 2022.*

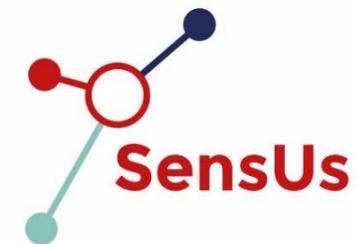
**TEXT** Roy Korthout

SensUs is an international student competition where students from all over the world participate to make the best biosensor for a particular theme. This year's theme is Acute Inflammation with a focus on sepsis; in short, blood poisoning. In September all the fourteen international teams come to Eindhoven to show their biosensor and we, the SensUs Organization, organize the full SensUs Event.

Within this organization, my job is to make sure all students have a pleasant experience during the SensUs Innovation Days: the period in which the SensUs Event will take place. Hence, within my department, we arrange a camping for all students to sleep at during their stay in Eindhoven and take care of most of the facilities and activities during the event, with their corresponding logistics.

Being part of an organization, we also try to establish a fun activity every now and then for both our department and the rest of the organization and make sure to frequently inform everyone on what we did and on what we are currently working on. We can then use the feedback we obtain during these plenary evenings to make better, well-informed decisions.

Of course, arranging an event does come with its difficulties. Making certain choices together with trying to make sure the organization agrees with our choices, working within a limited budget and arranging a collaboration with multiple companies, whilst making sure we coordinate everything well, are examples of such challenges.



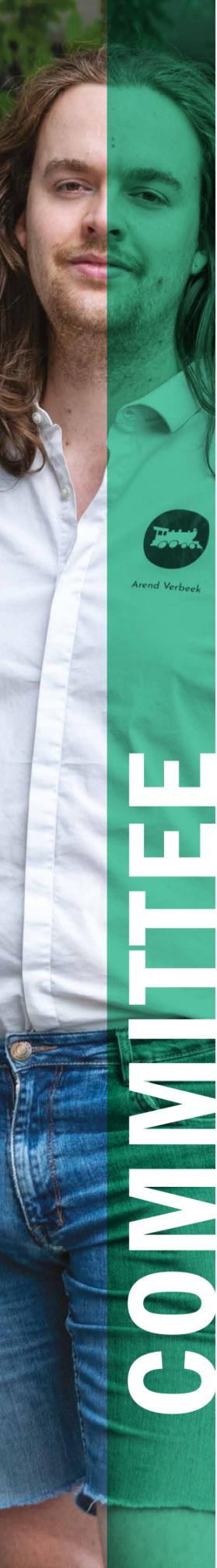
This does give us a big learning opportunity: as students without prior experience, organizing an event for around 150 people is not an easy job, but it provides a great means of developing ourselves. Hence, within the Events department, I was able to improve myself regarding communication, planning, negotiation, logistics and other skills that come with organizing an event! Teaching oneself to find alternative solutions and to act quickly if things do not work out is an immensely valuable skill to have in the future.

Although some of the challenges might seem difficult and planning organizational work next to school work might be difficult at some points, it is great to be able to socialize and do fun activities with others within the organization to keep each other motivated, since of course after all we are still a team of students!

Being able to do something next to my studies was a great means of developing my soft skills next to taking the regular mathematical and computer science related courses within the bachelor's program. I encourage everyone who looks to do something else next to their studies to check out the several student teams that TU/e has to offer: maybe there is something you might enjoy doing, given the amount of possibilities!

MEMBER

MEMBER



# COMMITTEE

## TRAINING ON PAPER: HOW TO BUILD A TRAIN

The training committee TRAIN has been bringing you soft skills and healthy snacks since 2017, which means our lustrum year has arrived. I have been with this committee almost since its debut and I have seen it grow up and age too. TRAIN's fifth birthday is a good time to look back and share my experiences working on the hurdles we faced as a new committee and how we solved them. Besides being fun and informative, I hope this piece is also an inspiration for anyone who wants to start a long-lasting committee within our association.

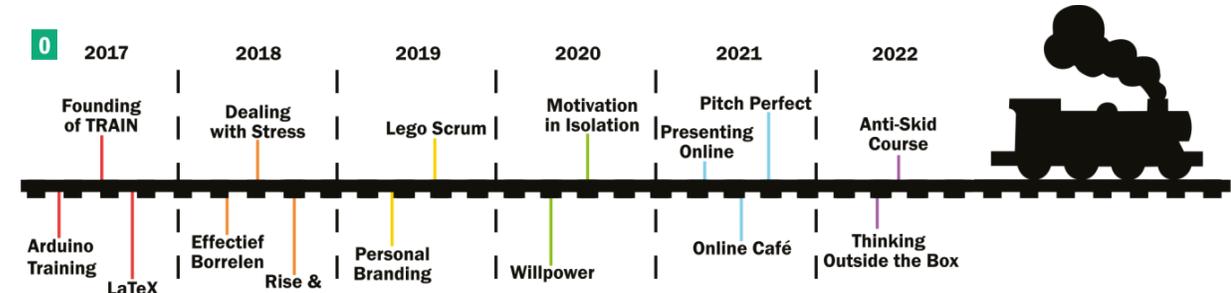
TEXT Arend Verbeek - TRAIN

In my first year (2016-2017) the current system of FYCs and first year workgroups was implemented. Two workgroups were tasked with organizing an activity for all of GEWIS. The first one decided to organize a children's birthday party and the second one wanted to organize an Arduino workshop. In case you don't know: Arduino is a system of electronics and software that are easily assembled and programmed. The workshop was a success. The people who organized this activity wanted to do more and together with some older members they decided to found a committee.

It was around this time that the candidate 36th board was thinking about what their goals as a board would be. Merel Pennekamp would occupy the 7th function of Innovation Officer and Merel wanted this new committee to be part of the innovation she would bring. TRAIN was born! The purpose of the committee was to organize trainings, but the overall goal was something more ambitious: TRAIN would put personal development on the map at GEWIS. People came to GEWIS to relax, to socialize, for support on educational issues and to get to know potential employers, but GEWIS didn't offer a lot of ways to gain new skills, besides joining a committee. GEWIS also had a lot of international members, some of whom it wasn't able to reach. TRAIN thought that the prospect of personal development could maybe lure these individuals

towards GEWIS. As soon as I got my binding study recommendation I joined TRAIN. At that time they were working on their first training, which was supposed to be specifically targeting first years. The reasoning was: if we convince the first years that personal development is a great way to spend their free time, we won't have to change their minds later. It was decided to organize a LaTeX workshop. We knew that the LaTeX workshop given as part of the first-year mathematics course Linear Algebra 1 was lacking and computer science students didn't even get one. For the older GEWIS members, we organized the Advanced LaTeX course, which was more about things you want to know when writing an academic article. Both activities were a success, attracting more than one hundred members between the two of them.

LaTeX is what we call a hard skill. Examples of hard skills are welding and programming in Python. Hard skill workshops are easy to promote because it's easy to explain what you will learn. Soft skill trainings (like managing stress and presenting) on the other hand, have a tendency to be more vague. We knew that GEWIS members, being slightly nerdy and exact-minded, would generally be less interested in soft skills as they are often viewed as pseudo-scientific. We came to the realization that good promotion was the key to showing GEWIS members these trainings were actually very informative and not vague.



As some might remember, before the current activity calendar system was implemented at GEWIS, getting a date for your activities was a nightmare. We wanted to do a training on stress management, but we couldn't find a free date on which the trainer we wanted was available. This is when the idea of lunch break workshops came up. The TU/e had just announced that to deal with their lack of lecture rooms, they would shorten the lunch break by 15 minutes to make room in the schedule for a 9th and 10th hour. We wanted to use our last couple of hour long lunch breaks well. But how do you fit a three-hour training in an hour-long lunch break? Well, you don't! Instead, you fit it into three hour-long lunch breaks. We planned three sessions, all a week apart, which would add to each other, but could also be attended separately. A great benefit to this surprising solution was that the trainer was able to give the attendants homework. A training-on-paper was written about this activity and published in Supremum volume 51, number 0 (this edition and other editions can be found at [supremum.gewis.nl](http://supremum.gewis.nl), red.), including all homework assignments, in case you're interested.

At TRAIN, we like to organize trainings connected to real life events. Are lunch breaks and therefore meeting times getting shorter? A training on effective meetings. Are days getting shorter again and you now have to wake up before the sun? A lunch lecture on sleeping patterns. Does the new board have a Brand Manager? A training on personal branding. We also like to attend trainings organized by other people, like the Wervingsdagen Skill Session and the place where Merel met the man who would become my inspiration (and secret crush), Imre Végh from Project Wijsheid. We hired Imre Végh to give us the training called Willpower! (with exclamation mark). I loved it and it

was also the training that inspired our current chair, Lucas, to join the FYC wagon.

Without much success, TRAIN had been trying for two years to start a first year committee workgroup (or FYC wagon), but the FYCs of 2018 and 2019 never showed the same interest in personal development as the bunch who founded TRAIN. This was of course the case until the FYCs of 2020 rolled around. Merel and I were able to gather four enthusiastic freshmen (three of which are members of TRAIN today), but then a little pandemic ruined everyone's day. TRAIN is never afraid to turn problems into possibilities, so we decided to organize a training that would help students stuck at home in lockdown. Through Imre, who was not available, we came into contact with Jan Reinder Rosing. Motivation in Isolation is still the most rewarding experience I've ever had as a member of TRAIN. We worked really hard, with a group of people who hardly knew each other outside of online meetings, to give the GEWIS members something we believed they could really use in that difficult situation.

Riding the TRAIN was not always easy. GEWIS members can be stubborn when you propose something new and freshmen are often more interested in either ECTS or parties than trainings, but we worked hard and really made a name for ourselves. Being a member of TRAIN has not grown old, but I feel like I have. Like many committees in GEWIS, TRAIN is having difficulties attracting new members. TRAIN originated from a FYC workgroup and in my opinion, the greatest things TRAIN has achieved have always been together with FYCs. We need some enthusiastic first and second years with new ideas. After that, I will depart. I'm proud of what we've achieved in the last five years and I'm sure TRAIN is on track for at least five more!

0 The TRAIN timeline

*Infimum: A strange or funny quotation from a teacher, a student or faculty member.  
Here you can find infima sent to the Supremum committee via [inf.gewis.nl](http://inf.gewis.nl).*

*\*Jelte organiseert ouderdagen voor GEWIS\**

**Jelte:** "Is de ouderdag ook voor data science?"

**Bartjan:** "3 uur over een marathon is echt amateuristisch."

**Robin:** "Ik ben zo blij dat mijn opa en oma niet naar de ouderdagen komen."

**Jelte:** "Tessa is god."

**Tobin:** "wat is nou het verschil tussen stroopkoeken en jodenkoeken?"

**Alexandra:** "Er zit stroop in."

**Tobin:** "In plaats van joden?"

**Eerstejaarsstudent wiskunde-natuurkunde tegen**

**Rink:** "Ik ben voor het eerst bij een feest; ben jij ook een eerstejaars?"

**Noa:** "Daan is subscribed for a business case"

**Daan:** "Which Daan?"

**Noa:** "You"

\*Daan unsubscribes\*

**Ruben:** "Jealy heeft haar bachelor gehaald!"

**Susan:** "Wie?"

**Zalán:** "Jealy, als in zijn vriendin."

**Noa:** "Ik vergeet veel. Ik ben een zandloper. Ohnee, een trechter."

**Samuel:** "Bedoel je een vergiet?"

**Rudi:** "...jullie zijn allemaal laffe batsers, ik ben met Grolsch in mijn klauwen geboren..."

**Tessa:** "We hebben het over mijn haaruitval"

**Leon:** "is dat omdat het lente is, dat hebben honden toch ook?"

**Arend:** "I was the Twister slave."

**Anne van den E.:** "Waarom zoen je nou weer met een Jorn?"

**Leon V.:** "Ik wist z'n naam niet."

**Anne van den E.:** "Oh, dan is het goed"

**Sanne de W.:** "Jorn is kaal!"

**Lieke:** "Die willen sippen, alsof ze bejaard zijn en in zo'n huis wonen."

**Chantal:** "Dat heet gewoon een bejaardentehuis."

**Chantal:** "Ik open de vergadering."

**Lieke na 2 seconden:** "Ik heb een punt voor de rondvraag."

**Sanne de W.:** "Het voelde ook heel raar om baby's bij het vuil te gooien."

**Lucas:** "I love pools, but I hate people."

**Lucas to Samuel:** "If we were better friends, I would have invited you to my birthday party."

*\*While writing the URD for SEP\**

**Jarl:** "Veerle, did you..."

**Veerle:** "Hold on, sorry. Can I just yell at Bartjan for a second?"

*\*Veerle turns to Bartjan\**

**Veerle:** "WHAT. THE. FUCK?!"

**Sanne de W.:** "Dat is een gatopvuller!"

**Thomas W.:** "Samuel zag een bal en douwde hem erin."

**Joy:** "My name is not translated to English."

*\*Het gaat over de ouders van Jelte.\**

**Lotte L.:** "Heten ze Jelte?"

*\*Voetbal staat aan bij de kroeg.\**

**Niekie:** "We kunnen nog niet weg, ik ben nog hockey aan het kijken!"

**Robin:** "Ik zou Jelte alles toevertrouwen, behalve mijn geheimen."

**Noa B.:** "Ik weet niet waarom, maar trouwen klinkt veel minder permanent dan samen een huis kopen."

**Sanne de W.:** "CBC!! Ik heb de printer gesloopt. (...) Of het papier is op! (...) Laat maar."

**Victor:** "Hoe heet jouw beReal? Hoe heet je überhaupt?"

**Tobin:** "Ik zeg niet dat cocaïne vlees is, maar..."

**Robin:** "Jij dacht dat ik een vrouw was."

**Emma's vader:** "Dan moet je maar niet zo'n naam uitkiezen."

**Lieke J. verontwaardigd:** "Waarom ben ik leuk?!"

**Sanne moet iets Frans opschrijven:** "Wie Wie!"

**Leon:** "Ik ben ook voor het scheiden van mannen en vrouwen."

**Leon V.:** "Ik wilde naar moetikeenrietadt.nl, maar ik kwam op moetiknaardedokter.nl, dus die ben ik nu aan het invullen. (...) Hoest u bloed? Nee, dat denk ik niet."

**Noa B.:** "Klapperende eierstokken is voor vrouwen. Klotsende eierballen is voor mannen."

*\*Watching Estonias act during Eurovision\**

**Lucas:** "I think he looks like a mix of Duncan Lawrence en Max O."

**Gijs de M.:** "Doe net als bij how I met your mother."

**Sanne de W.:** "Nee, dat wil ik niet! Dat is te link."

**Samuel:** "Zullen we naar Hoogeveen?"

**Sven:** "Is daar meer te doen dan in Leeuwarden?"

**Samuel:** "Ja Rinks ouders!"

**Samuel:** "Nee, maar niet op die manier."

**Leon:** "Ik ben aan het pissen."

*\*Anne, Gijs en Noa juichen.\**

**Leon:** "Nu niet meer want ik moet lachen."

**Victor:** "wat was er op 18 september?"

**Jan:** "nine eleven"

**AED:** "Stay calm."

**Sanne:** "Aaaah!"

**Rink bij oefenreanimatie:** "Je moet hem helemaal niet slaan. Toch?"

**Wietske de B.:** "SAO lijkt echt veel op SOA trouwens."

**Jelte de K.:** "Dat is iets Zeelands"

**Wouter over een Sticky-bestuurder:** "Deze meid is zo subtiel als een baksteen in je gezicht."

**Wietske de B.:** "Blij dat ik normaal een vrouw ben."

**Lotte L.:** "Ik keek net naar boven, en ik dacht oh mijn God, een gat."

**Noa:** "Sinds wanneer is schoppen aanranding!"

**Samuel:** "Sinds ik het kinky vind."

**Sabine:** "Het gratis moet wel ondersteuning van het eten zijn."

**Sanne:** "Ja maar ik eet mijn maaltijden altijd graag dronken."

**Tessa:** "Wat vind je van mijn parfum?"

**Jelte:** "Wel okee, maar als je het te veel ruikt word je denk ik wel misselijk."

**Robin:** "O geloof me dat is echt niet zo."

**Tessa:** "Hebben jullie ook dat jullie een soort sinus-functie zijn vanavond?"

**Lieke:** "Ik wil zo ook wel varen, maar je moet er wel naast blijven zitten want ik ben niet zo goed in Mario kart."



# MATHS AND CRAFTS

Many people that know me have probably heard me talking about my passion for paper crafts, especially origami. Even if you don't know me, you may have seen some of it on the cover of *Supremum 54.0* earlier this year. When you hear origami, you probably think of a paper crane or newspaper hat. However, it is much more than that, as I will try to highlight in this article.

TEXT Anne Nijsten

The crane and newspaper hat are examples of traditional origami models. These were the ones I started with, when I learned to fold them from some Japanese friends at my primary school. Over the past few decades, the art of paper folding has expanded to a variety of models wider than those traditional ones that require only a few folding steps. Some are similar in that they also try to depict everyday things, like household items or animals. However, the level of detail may be much higher. By using special kinds of paper, a very realistic result may be achieved, like the tiger designed and folded by Bodo Haag below. Considering that often only one sheet of uncut paper is used, the result becomes even more impressive.

Personally, I like more abstract geometric patterns the most, especially the so-called "tessellations" and "fractals". One of my favorites are combinations of the hydrangea and clover tessellations, like on the edge of the right page. While most of these models seem to be very angular, there are also designers who work with very smooth, curved shapes. As a mathematics student, this is not very surprising, as we probably all

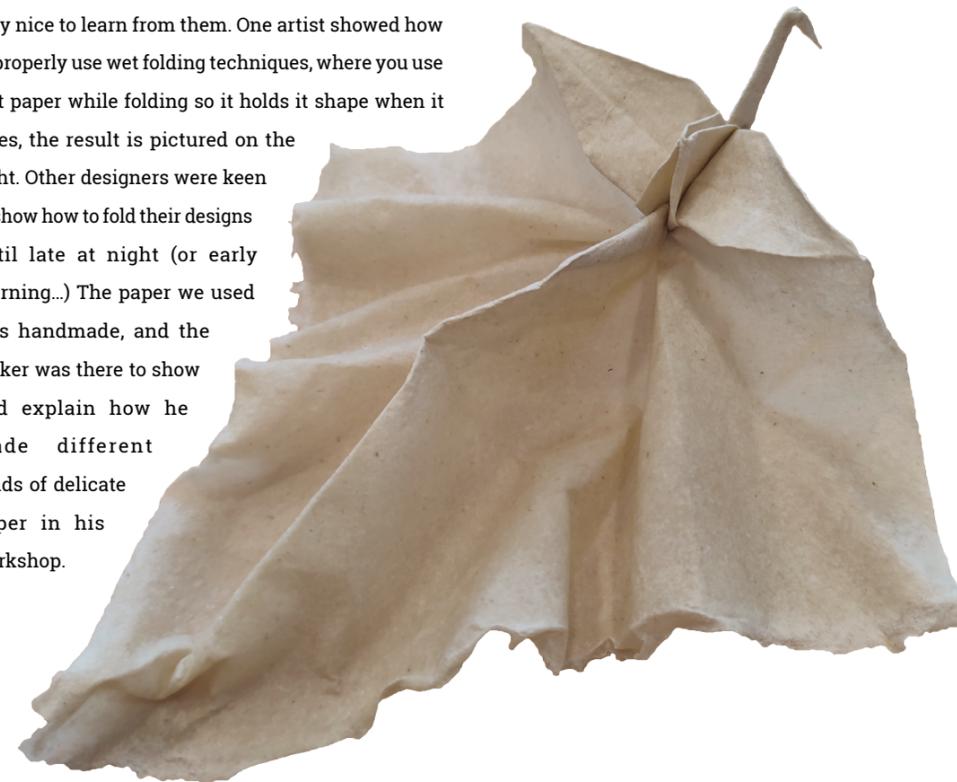
can enjoy a nice mathematical fractal or tiling (tessellation) like those of Mandelbrot or Escher. Just like fractals and tilings, origami is also studied in a mathematical way by some people around the world. Every few years, there even is an international conference held on the topic of origami in science, mathematics, and education (OSME). Here engineering solutions like origami stents, the use of origami in mathematical education, proposals for computer modeling of origami, combinatorial properties of folding paper and more topics are discussed. As I found out in my first year at the university, the classical geometry problem of trisecting an angle using only folding made a nice topic for the presentation we had to do as part of the professional skills program.

Recently, I learned that there are many other communities of folders. First, I met some of them online during the lockdowns. An Iranian designer started with OrigamiTalk, in which origami designers from all over the world were interviewed in interactive Zoom sessions. In between those lockdowns, I got to meet some fellow folders in Eindhoven, who then



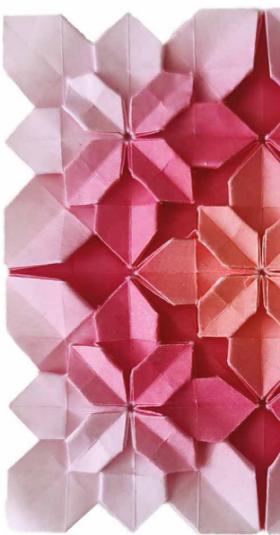
started organizing online and offline meetings for the Origami Group Eindhoven. There I found out about international mailing lists and discord servers where folders shared all kinds of items related to origami. In May 2022, I got to meet around 150 of them in Bonn, Germany, at the annual convention of the German origami association.

Apart from the weird feeling I got from meeting people there who talked in, and understood origami jargon ("kusudamas", "22.5 degree folds", "open sink"), it was very nice to learn from them. One artist showed how to properly use wet folding techniques, where you use wet paper while folding so it holds its shape when it dries, the result is pictured on the right. Other designers were keen to show how to fold their designs until late at night (or early morning...) The paper we used was handmade, and the maker was there to show and explain how he made different kinds of delicate paper in his workshop.



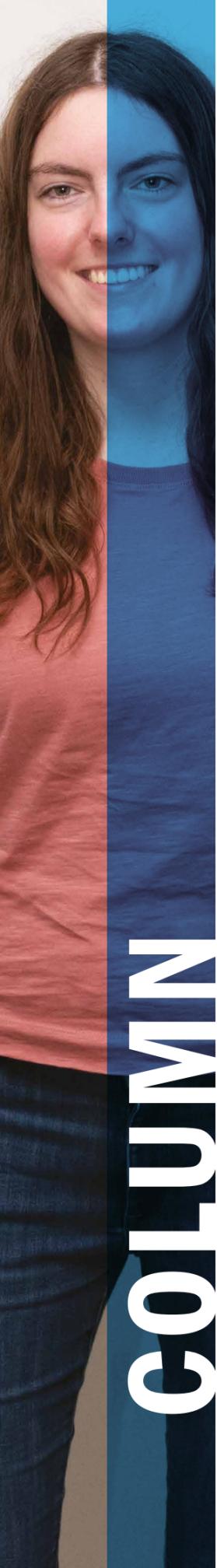
Of course, as a paper folding enthusiast, knowing about different kinds of paper and their properties is a must, as the choice of paper can make or break the origami model it is used for. Finding that many people to share a hobby with was very exciting, so I hope to meet them again at other conventions held in the world.

Apart from paper folding being a hobby on which I can focus in my free time, it also sometimes is useful in other situations. From requests to improvise a model using banknotes on a wedding, folding a swan at the election GMM to making last-minute gift decorations from leftover wrapping paper, and trying to not get bored during classes in high school, which resulted in over one thousand cranes, the origami skills seem to come in handy at unexpected moments. And even though I can confidently say I have some skill at paper folding, there are still many techniques and models that I can learn, keeping this hobby challenging and fun.





*LUSTRUM GALAXY, 18TH OF JUNE 2022*



# GROWING YOUR BRILLIANCE

**B**rilliance can come in many ways: a drive for curiosity, a soft spot for risks or a hunger for knowledge. You must have met individuals that embody these characteristics, I consider those to be admirable, and hence I try to grow in those fields. However, as you probably experienced yourself, this is harder than it seems. Motivation only lasts for so long, and is not enough to finish, say, a Bachelor's at the TU/e. In this article, I would like to give you tips that I discovered during my three years of studying, such that you too can achieve your goals!

TEXT Isabel Rutten

Before you start working on some job, identify all tasks that you actually need to do. By making this list, it is ensured that no chores are left out and it is clear how much work needs to be done. If preferred, these tasks can be divided into different categories, depending on their source (e.g. school, Supremum). For these tasks it is important to set small tasks, such that it is comprehensible what the tasks exactly entail and how much time they will require. If there is a big job, like writing a report, divide the task into subtasks. This way, it is easily understandable what needs to be done, what the progress so far is and – my favorite part – you actually get the possibility to strike something off your list within reasonable time. I recommend the tool Trello to make these task lists, as you can make a list per category and view it both on your phone and computer.

Now that we know all tasks that need to be done, they also need to be scheduled. For this it is relevant to know what deadlines you have and when you are not able to work. After noting these down, try to identify your personal work patterns. I happen to be more productive in the mornings and more easily distracted in the afternoon – something people who have seen me play table football at GEWIS can probably confirm. Hence, I try to schedule tasks that require a lot of thought in the morning and simple tasks in the



afternoon. My daily schedule is divided into five 2-hour blocks, based on the TU/e schedule: 8:45-10:45, 10:45-12:45, 13:30-15:30, 15:30-17:30, 19:30-21:30. This is also because I generally need more than one hour to finish a task, due to start-up time and similar factors. Using these blocks simplifies the scheduling process, because otherwise you would have to schedule for a specific number of minutes. The most important part of scheduling is realism: if you plan to finish a 5-hour task in 2 hours, then trying to keep up is a pain in the ass, resulting in giving up. However, learning to plan realistically takes a lot of practice. Instead of feeling

defeated, take it as feedback to improve your future schedules! My first tip for achieving a realistic schedule is accounting for delays. Especially in the beginning, expect to need more time than you originally accounted for. I try to ensure that there is a day in the week in which I catch up with possible delays that have come up, such that I can still keep up with all tasks. By making this schedule, I have created an insurance that I have time in the evenings to do fun activities without thinking about school and feeling stressed out.

“ My first tip for achieving a realistic schedule is accounting for delays ”

Lastly, we need to do the tasks. When feeling unproductive, some simple tasks may seem impossible. I started using the pomodoro method to ensure that I keep doing something productive and that hours don't accidentally slip by while watching animal videos. The pomodoro method, created by Francesco Cirillo, uses a timer to break work down into intervals, traditionally 25 minutes in length, separated by short breaks of about 5 minutes. I like using the website pomofocus.io for this as it also allows adding a list of tasks and checking them off, but you might as well just use a simple timer. I personally like this method a lot, because it still allows me to take breaks (i.e. watch animal videos), but in a controlled manner. This brings me to the next point: take breaks! This makes sure that you stay focused and you can refresh yourself. Staying focused can also only be done if you do not go on distracting websites. Motivation might keep you off of these websites for a while, but I have started using the Chrome extension StayFocusd, which blocks certain websites for certain days, during certain hours ensuring that I do not go to time-wasting websites without a second thought.

Do you sometimes feel unmotivated to keep up with these tasks? Try to remember your goal, why you do this. Though you might feel like that will not help you (as is the case for some professional skills activities) think of the bigger picture. What would you like to do in the future? What needs to be done to achieve that? If you are working on a task that coincides with an answer to the second question, then congratulations: you are working on your future! Here's a pat on the back from your future self.

“ ...think of the bigger picture. What would you like to do in the future? What needs to be done to achieve that? ”

I hope that these tips have given you the tools to accomplish all your objectives. After writing this article I sure feel motivated to get to my other tasks. If there are any other tips you would like to share with me, I would be happy to hear them! Good luck with growing your brilliance!





# GRADUATION PROJECT

Since you're probably a student at GEWIS, you might have heard of this common thing known as a graph. Mathematically, it is quite simple to describe: pick a set of vertices  $V$  and a set of edges  $E$  and together they form a graph  $G = (V, E)$ . This concept is very straightforward, but the applications of graphs are endless. They can describe the structure of machine learning models like decision trees and neural networks, but also allow you to find the shortest path in a graph-like problem. It is this simple structure that I exploit in my graduation project to model and analyze a manufacturing process.

TEXT Ava Swevels

I started my graduation project at NXP at the end of last year. The only thing I knew back then was that I was interested in using event graphs to model one of their manufacturing processes. But before I deep-dive into my graduation project, it is best to give you a quick introduction to event graphs.

Most processes consist of discrete steps in time, referred to as *events*. It is often interesting to analyze these events and verify whether their order matches the expected process. To enable the analysis of these processes, the events are stored in event logs. One of the drawbacks of current implementations of *event logs* is that they consider only a single perspective of the process. Consider the case where you have just ordered new shoes and some matching socks and are tracking the parcel. As a consumer, you're interested in where the package is located and how long it will take until it arrives at your home. However, the delivery company might want to track the shoes and socks separately, thus tracking the unique invoice number. Hence, the same process yields multiple perspectives (formally known as *entities*), but this is not supported in conventional event logs. Event graphs have been introduced to capture the relations between these entities (the package, the items, the shipment, the invoice, et cetera) and the temporal ordering between the events.

Before we go deeper into what my graduation project entails, I would like to talk about myself (and who wouldn't?!) and how I got this project in the first place. The words you are currently reading have been written by Ava Swevels. In 2015, I started my undergraduate studies in Computer Science. I thoroughly enjoyed the mathematical side of the program and quickly understood that I didn't want to be a software  $X$  (fill in whatever software role you can think of). As my bachelor project drew to a close and I still didn't figure out what I wanted to do afterward, I looked into several other study programs.

Jumping through several hoops and beating around the bush for six months at both Utrecht and Tilburg University, I finally went for the most common option: continue with a graduate program in Computer Science at the TU/e. During the program, I registered for several electives from the Industrial Engineering (IE) department and enjoyed these courses immensely. That's when I decided to combine my current program with the IE program *Operation Management & Logistics*. Remember that saying about finding what you truly enjoy at the time that you least expect it? I guess that's true! It took some trial and error to figure out what I wanted to do, but I had found what I was passionate about at last. Would I go on this journey again if you'd ask me now? Definitely!

When my graduate program came to an end, I started reflecting on the things that gave me the most fulfillment. I knew that using my CS skills, I wanted to solve practical, preferably industrial, problems. One of the most interesting concepts that I encountered during my studies was *event graphs*. I reached out to the teacher who taught me this concept and, as luck would have it, he was aware of a project at a company interested in using event graphs to model their manufacturing processes.

And so, without much delay, around December of last year, I started my graduation project at NXP. It quickly became clear to me that I would have to focus on one of the assembly processes of wafers. The goal was to create a *digital shadow* of this process: a digital representation of the events that occurred during each specific process instance. Additionally, I had to show that it was possible to generate an event graph from this process and the usefulness of analyzing said event graph.

“ Remember that saying about finding what you truly enjoy at the time that you least expect it? I guess that's true! ”

So how do you prove that a novel technique works in an industrial setting? First, it is vital to understand the process and the data generated from it. This means I had to explore the data from top to bottom and validate my findings with the domain expert. After I had a solid understanding of the machines used in the process and their generated data, it was time to preprocess the data. Subsequently, the preprocessed data could be injected into the event graph.

Secondly, after preprocessing is complete, the event graph must be stored for analysis purposes. Storing event graphs is similar to how you would store data in a regular SQL database, except - *plot-twist* - it does not use SQL! As graphs cannot easily be stored in a tabular format, it is more useful to store their vertices and edges in a *graph database*. To query relations in a graph database, we must reason about the structure using a graph-like ASCII-art language called *Cypher*. Imagine that you are interested in querying readers of this *Supremum* magazine. We might come up with the following query:

```
(Person) -[:READS] -> (:Magazine {Name: 'Supremum'})
```

Using Cypher, we can exploit the graph structure to create and find relations that are not evident in traditional tabular databases. Using the technique of graph database and graph querying, I'm looking to analyze the digital shadow I have created and find cause-and-effect relations between events that occurred during the process and the final output.

I hope that this story has piqued your interest and given you insight into the search for a graduation project, as well as my search for what I am passionate about. If you want to learn more about my project or my double degree, feel free to ask me any time! As a last reminder, I want to stress that a graduation project can be challenging and trying at times, so choosing a topic you enjoy is essential. It is okay if you go through many hurdles to find that topic, as long as you are happy with your decision.

Good luck and see you on the other side!

# MEET THE KANDIES!

**H**ahaha! Do you hear that? Some clowns are going to introduce themselves! You might have met some of us, we are the candidate board members (kandi's) of GEWIS after all! If not, be sure to laugh with us and tell us some good circus jokes, that always cracks us up! As we are kandi's, we have to juggle a lot of responsibilities in the future and make sure that our circus isn't going up in flames. Because of this, we have also decided to each write someone else's part as we all know each other so well already! So without further ado, we hope you got to know us a little better as well.

TEXT The candidate 41st board

## WIETSKA

The name is Bondt, Wietske de Bondt. This sparkling lady is going to be the chair of GEWIS next year! Wietske is currently a third-year Mathematics and Computer Science student and has been an active GEWIS member from the start. In her first year, she joined the crazy FYC G.E.K. with whom she always enthusiastically sang 'Maak me gek' in the Ameezing. In the years following she joined GSM, SR, Intro21 and became the praeses of GEHACK.

Besides spending her time at GEWIS, she is also an active member of Ichthus, where she has done a lot of committee work and joined the fraternity Gisselle. Additionally, Wietske has played korfbal for more than 12 years and therefore also joined Attila when she moved to Eindhoven.

Even with her busy schedule, there is of course time left to attend fun activities and parties. You might have already spotted her dancing with brilliance at a GEWIS party or Thursday night. She also loves to be outside and go for walks with her family in her hometown Ede, especially when the sun is shining. And as you might know, it doesn't matter whether it is summer or winter, Wietske is always happy with some good ice cream.

If you want to know more about Wietske (you do!), don't

hesitate to have a chat with her! You might even hear some infimum deserving statements or very good puns, which she loves to make.



## DAAN

The next in line is our lovely Daan Verkade. You might be wondering already, but yes, he is family of the cookie company 'Verkade'. He is a 21 year old young-man studying Computer Science, who loves talking to people and telling stories. That is also why it might not come as a surprise that he is the next Secretary, since the secretary may write stories all the time. All of you will be able to read his glorious stories in the weekly newsletters, starting from the 1st of July. If I have sparked your interest in his stories already, feel free to ask him about it in the GEWIS-room, because he enjoys telling you all about it!

What may come as a surprise is that the candidate secretary makes jokes about himself being an

undiagnosed dyslexic. This sometimes causes the (draft) minutes to shine bright red with spelling mistakes. Fortunately, red is the beautiful color resembling GEWIS and, of course, the spelling check mechanism exists such that Daan can learn from his mistakes.

When Daan is wearing his glasses ('bril'), his brilliance is improved, by transforming him into a Sexytaris. His naturally good looks fit well with his fraternity In Vino Veritas, of which Daan is a proud member. When not tasting wine with I.V.V, he is active in several other committees (C4, GEFLITST, Intro22, GEBEUN), travelling Europe with AEGEE, or making music on one of his guitars.



## SAMUEL

When thinking of money, the function treasurer comes to mind, or maybe the Pink Floyd song of the same name. Just as the lyrics say "Money, It's a gas. Grab that cash with both hands and make a stash". This refers to money being the fuel of every living person. With money, we get food, shelter, and heat. To make sure every penny is spent on the right resources, we need someone who is organised and a quick learner.

That's where Samuel comes in! Our money-loving, cash-spending, 21 year old, fourth-year student and future treasurer of GEWIS loves to spend and organize money. He is also the future board member with the most committees he's active in. To be precise, he is in eleven committees! Besides spending all his time on these committees, he is also working on SudoSOS (our lovely upcoming POS system). Don't be fooled by him telling us SudoSOS is done in five minutes, as this would be naïve. He works day and night, making sure

that everything works. However, if you think that Samuel doesn't have any time left, you'd be wrong. He is also, since very recently, a proud member of the fraternity "In Vino Veritas" where he is bringing the formal, studentlike and Burgundian lifestyle to GEWIS.

Overall, Samuel is a great guy, and a great guy you can have a drink with. We couldn't ask for a better successor! He might not buy a small bus for the association, however he will do his best to conquer any problem that is in his path.



## LUCY

This brilliant piece of a human being you see here is the one and only Lucy de Graaf! Best known for being herself, or to be more specific, her straight-to-the-point, no-nonsense attitude. Of course you have seen her around GEWIS, unless you hate fun and social drinks, since she is a proud BAC'er. This means that every Thursday she is doing the most brilliant task ever: handing out beers.

But before her story came to this point we first have to go back to her first year. She began her study bachelor Applied Mathematics three years ago. Next to this she quickly had the dazzling idea to join FYC20-5 Lorem Ipsum, and that's where her GEWIS story starts. Did you know she is also an aspiring member of the brand new GEBEUN? Surely, this means she will make the most genius FYC scoring competition board that anyone has ever had the chance to lay their eyes on.

However, she is much more than just a GEWIS'er. This personification of gleaming joy has a hidden power. She has the unexplainable skill of brightening every

room she walks into. Her sincere smile is able to cure just about any hangover, or at least lighten the headache for a minute or two.

If you can't get enough of this bright mind, you're in luck! Lucy will be the next Internal Affairs Officer! This means you can go on quarterly coffee dates, or tea if that is your thing. Don't be alarmed, you don't need to go on a coffee date to experience Lucy, you can simply walk up to her when you see her and she will gladly talk about whatever is on your mind.



## BARTJAN

We also cannot forget about our lovely Bartjan Henkemans! Bartjan, also well known as BJ, lived most of his youth in the beautiful city of Antwerp. You could almost say he is the most brilliant international kandi GEWIS has ever known. This brilliance is also noticeable in his study, since BJ is a double bachelor student who is currently enjoying Mathematics and finishing the Computer Science bachelor.

Besides his study, he is busy with multiple committees such as GEHACK, CBC, and the Student Council. These committees actually are a quite good representation of what kind of person Bartjan is, as he is also known as "The new Trienco" and cares a lot about education. This is why he will make the best Educational Affairs Officer of the 41st board of GEWIS!

Apart from all these brilliant capabilities of Bartjan, he is also a great guy who is very nice to have around. Sadly, BJ is a busy boy so finding him can be quite hard. Luckily, there is a perfect solution to this problem! He made sure to make a lot of weird and funny quotes so you will easily find him in the Infimum section in

the Supremum. But if you are lucky enough to find him in person, don't be afraid to say hi and maybe even enjoy some live-action infimum talk.



## JASPER

Jasper will next year be the External Affairs Officer of this association. Japp is currently a third-year Computer Science student who is super active within this association. He started his journey in FYC 20-1 [FUN] of which he was the beloved chair. Unfortunately, Japp had somewhat of an identity crisis in his first year as people could not distinguish between Joris and Jasper - the solution was to call him "Meneer de voorzitter".

He enjoyed his FYC so much that he helped found First Year Support, a committee to get first years more involved in GEWIS. Last, but certainly not least, it was time for Jasper to dust off the gavel as he became chair of the amazing Lustrum Committee GR8-Times. This academic year Jasper was at the helm when organizing all the amazing activities our association enjoyed while celebrating the 8th lustrum.

Now that I said a lot of positive things about Jasper, believe me, this is only a small selection of good things, I would like to present the clown that he actually is



(after all, we are all a bit clownish). This crazy Limburger feels most comfortable when he is not wearing his pants at home, but he cannot function without his socks. Finally, going out with Jasper is always a blast. Unfortunately, you won't see him around that often as his small bladder holds him back.

## CELINE

Last, but definitely not least, is our seventh function for next year, the lovely Celine de Jong. Celine is currently a third-year mathematics student who lives in Eindhoven. Celine is brilliant and has passed almost all her courses already: she is currently working on her bachelor's final project which means she has almost finished her bachelor's.

Starting in the first year, after an amazing intro week, Celine became an active member at GEWIS. In her first year, she began in the FYC G.E.K. together with Wietske, and next to this, she joined the ODC. After this adventure in the first year, Celine joined C4, GR8-TIMES the lustrum committee, and now she is also 'feut' from the BAC. Next to all this fun committee work, she is often in the GEWIS room, either working seriously or



playing games and drinking a beer at the bar.

Celine comes from Diepeveen, where her family lives. She likes to go home for the weekend sometime and rest up for the busy weeks that she has ahead in Eindhoven. And the upcoming year will become very busy as Celine has her own function in which she will focus on career development within the Department of Mathematics and Computer Science. The goal will be to give students a better view of what they can do after their studies.

So if you want to know more about Celine or her function you can always ask her since you can find her most of the time in GEWIS!



*Infimum: A strange or funny quotation from a teacher, a student or faculty member.  
Here you can find infima sent to the Supremum committee via [inf.gewis.nl](http://inf.gewis.nl).*

**Arnoud:** "Ik heb geplast. Nu ben ik weer capabel!"

**Chantal:** "Ik moet zo nog even naar mijn laptop kijken."

**Sven:** "Ik moet ook nog naar de wc."

**Bouke:** "I.V.V is een vrouwendispuut, het is bepaald!"

*\*Het gaat over de WowBurger\**

**Ruben:** "Hebben ze daar ook vegetarisch?"

**Bouke:** "Ja! Ze hebben in ieder geval halal!"

*\*piano man speelt\**

**Dirk:** "Dit klinkt als de Unox reclame"

*\*Rink tijdens de CBC barbecue\**

**Rink:** "Niet jezelf in de brand steken. Heb ik daarnet ook gedaan. Dat is heet."

*\*Celine, tijdens de WISO-tour\**

**Celine:** "Rink is 22 april jarig, dat is 1 april maar dan 21 dagen later."

**Magnus (wervingsdagen bestuur) tegen Anne:** "Ja maar Anne, jij mag gewoon een kind krijgen volgend jaar, mits Samuel dat ook wil!"

**Houthuijs:** "Een mergpijp is een broodje."

**Gerben:** "Waarom heb jij Rummikub? Alle vrouwen spelen tegenwoordig Rummikub."

**Bouke:** "En jij vraagt waarom ik Rummikub heb?"

**Eline B.:** "Noa, jouw mening telt .... niet!"

*\*4chaos meeting\**

**Victor:** "Any final inquiry?"

**Bianca:** "I would like another muffin please."

**Sanne de W.:** "Ik ben al jullie bier aan het wegtanken; doe ff aardig."

**Alexandra S.:** "Sanne... Is gewoon Sanne."

**Remco:** "You need to put the dots on the i."

**Hannah:** "Er ligt een obstakel op de weg."

**Robin:** "Kut B.O.O.M."

**Chantal:** "Ik wil een Dionne doen, maar je weet niet hoe het loopt, het zou ook een Ilona kunnen worden."

**Samuel:** "Yes we can!"

**Jasper:** "Bob de Bouwer!"

**Samuel:** "Gast, Obama."

**Sanne de W.:** "Jeej, AI! Dat is mijn passie!"

**Max O.:** "Jij bent de voorzitter"

**Anne N.:** "Nee, ik ben er klaar mee"

**Max:** "Als ze een vijver hebben, gaan we wel skinny dippen."

**Roy:** "Hoe ga je skinny dippen in je rokkostuum?"

**Bartjan:** "... Ik denk niet zo goed en daar gaat het fout."

**Tygo:** "It is quantum tunneling, therefore the rice must be teleporting."

**Egor:** "Desert is the fish of the meal."

**Tessa:** "Hoe heten die 4 mannen die optreden?"

**Dorine:** "De teletubbies"

**Sanne de W.:** "Ik heb niet eens gelezen wat er staat; ik was afgeleid door de tanden van dat kind."

**Irne:** "Je hebt een actiefilm met The Rock."

**Leon:** "Moana!"

**Romy:** "Zeg het maar als jullie willen slapen, dan gooi ik even mijn natte handdoek over de lamp heen"

*\*Lieke kijkt in een zoals gewoonlijk overvolle GEWIS koelkast\**

**Lieke:** "Waarom is mijn gaatje opgevuld?!"

**Tessa:** "Ooh noemde je me nu oud?"

**Victor:** "Nee ik noemde je dik."

**Anne van de E.:** "Mag ik de koffie met de lekkernijen zonder lekkernijen?"

**Seveerster:** "Gewone zwarte koffie?"

**Anne van de E.:** "Ja, de koffie wel."

**Leon V.:** "Er zitten overal piemels in. Er zijn overal piemels."

**Rink:** "Je kunt zelfs de laatste Supremum van dit jaar niet aan je moeder laten lezen."

**Sanne de W.:** "Dat wisten we toch al lang. Je kent me."

**Sanne de W.:** "Ik was zo enthousiast over Rink doodmaken dat ik mezelf ook doodmaakte."

**Leon V.:** "Je moet wel leuk doodgaan."

*\*Liselotte knort van het lachen\**

**Sander:** "Undefined sound"

**Bram:** "Ik vind dieren best mooie beesten."

**Jasper over Bram's logeerkamer:** "Ben benieuwd wie daar eindigt vanavond."

**Bram:** "Hopelijk niet ik."

**Leon V.:** "Ik dacht dat het bestuur in de ruimte stond met kandies. Maar het bleek gewoon Défi te zijn."

**Sanne wordt gebeld, 5 dagen nadat ze geen bestuur meer is:** "Nee, ik heb eigenlijk nog nooit gehoord van Wervingsdagen."

*\*Jelte opent gordijn\**

**Jelte:** "Ugh dit licht is zo vervelend."

**Stefan:** "Je moet wel oppassen, er kunnen auto's door de poort lopen."

**Tycho:** "I have sausage juice all over my hands."

**Sanne:** "Woorden zijn helemaal niet grappig als mensen het concept van woorden niet begrijpen."

**Viktor:** "Ik moet nog een keer langs om de auto te proeven."

**Aimee:** "De staat van mijn lever is onder het logo."

**Ruben:** "Wie banaan zegt, moet ook snijden op de fiets zeggen."

**Daan in de McDonalds:** "What the fuck. Dit is banaan."

*\*Daan checkt bonnetje.\**

*\*Daan neemt nog een slok.\**

**Daan:** "Onee, het is toch vanille."

**Noa tijdens het dieren spel:** "Telt asbest als dier?"

**Noa:** "Je moet er niet in knippen; je moet gewoon harder zuigen."

**Rink:** "Deze supermarkt is op Quatorze Juliet open."

**Noa:** "Wat hebben we daaraan? Dan moeten we 4 dagen wachten."

*\*Tijdens 30 seconds\**

**Rens:** "Een snelle spits van Nederland rond 2010."

**Janne:** "Hunkemöller!"

**Anne:** "Als je het doet [vegetarisch zijn] vanuit milieu-perspectief, dan moet je juist mensen eten."

**Wietske:** "Lucy, je bent niet lelijk genoeg!"

*\*Wietske en Celine over BV notulen\**

**Wietske:** "Is dit een Rick met ck?! Ik vind hem echt een Rick met K."

**Celine aan de andere kant van het bestuurshok:** "Nee joh, echt een Rick met enkel een k."

**Tobin:** "We gaan nu naar de mededelingen. Heeft er iemand nog een rondvraag?"

## COMMITTEES & FRATERNITIES

**G**EWIS is built on top of committees. Besides, Study Association GEWIS has several fraternities which contribute to the atmosphere and organize activities.

Find out more at: [www.gewis.nl/association](http://www.gewis.nl/association).

### FRATERNITIES

**ATHENA**  
ATHENA



**B.O.O.M.**  
Buitenplezier Op Onze Manier



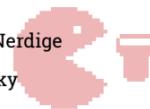
**Défi**  
Défi



**GELIMBO**  
GEWIS Ervaart Limburgse  
Initiatieven Met Bewondering  
en Ontzag



**GEPWNAGE**  
GEWIS Plant Weer Nerdige  
Activiteiten en Geeky  
Evenementen



**I.V.V**  
In Vino Veritas



### COMMITTEES

- ABC ★**  
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- AC**  
Activiteiten Commissie
- AVICO**  
Audio- en VideoCommissie
- BAC**  
BAr Commissie
- BATA**  
Batavierenracecommissie
- C4**  
Corporate Communication and  
Contact Committee
- CBC**  
Computer Beheer Commissie
- GEBALLMERPIEK**  
GEWIS'sers Ervaren BALLen MET  
Rigoreuze Precisie In  
Excentrieke Kups
- GEBEP**  
GEWIS Borrows Euler's Proofs
- GEBEUN**  
GEWIS'ers Beunen Enkele  
Unieke Nuttigheden
- GEDWAAL**  
GEWIS'ers Dwalen Waar  
Anderen Anders Lopen
- GEFLITST**  
GEWIS Fotografeert Leden In  
Toffe Situaties, Toch?
- GEHACK**  
GEWIS Ervaart Het  
Algoritmisch Code Kloppen

- GELOBAL**  
GEWIS'ers Loving Open  
Borders and Abolishing  
Language barriers
- GETAART**  
GEWIS'sers Eten TAART
- GEZWEM**  
GEWIS Zeilt Weer Een Meter
- GR8-TIMES**  
GEWIS Rotates 8 - To Its Most  
Endless State
- GSM**  
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### SUPREMUM

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