

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

G E W I S

 SUPREMUM

VOL 50 Nº 2

THE
MYSTERY
EDITION

EDITORIAL

EDITOR IN CHIEF Nadya van Schaik

Life is full of mystery. Nobody knows what is going to happen next, and nobody knows what life will bring. Some people like mystery, some people don't. But one thing is for sure: whether you like it or not, it will always be there. And even though mystery is unknown and you are unable to grasp it, many people have thought about it. Take for example Albert Einstein. He once said in *The World As I See It*:

"The most beautiful experience we can have is the mysterious. It is the fundamental emotion that stands at the cradle of true art and true science."

It is a remarkable quote by a man who solved an incredible amount of mysteries. As he said, a mystery is the point where true art and science start. Without mystery, many of us wouldn't have a job, surprises wouldn't exist anymore, and everything would be known to man. To be honest, it would make life quite boring.

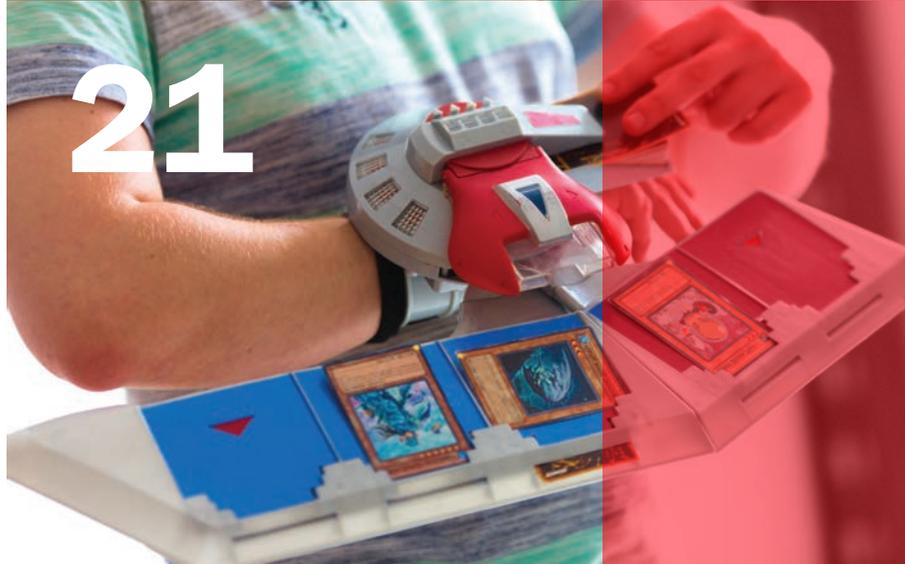
Why, you may ask? Sure, knowing what will be asked on your next exam might be a blessing, but knowing what will happen in the upcoming season of *Game of Thrones* would be a shame. Mystery gives us a purpose: we want to know the answers to who, what, where, when and how.

Now can be the time to solve a new mystery. Flip the pages of the *Supremum* and find out what amazing articles have been written. Some of them will elaborate on mysteries you might have heard of, while others will discuss subjects that are yet to be known.



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GEWIS

CHAIRMAN'S NOTE

The day I am writing this is the day just before the election GM for the 37th board. It is strange to realise that my year as a chairman is almost over. The moment you are reading this, we, the 36th board, will be studying again and a fresh group of people will be working on the mysteries of our association.

TEXT Laura Kuntze

Although you do not expect it, being the board of GEWIS is kind of a mystery! You probably start it because you like the association, because you want to develop yourself personally or because you are curious about all the adventures and constitution drinks the old board members are talking about.

As soon as the year starts you will realise that a board year is way more than that. The first thing you will see, is that things that mysteriously (dis)appeared or that were mysteriously fixed in the room by gnomes or something, do not appear or disappear that mysteriously. It is a board and a lot of very active members that are behind those 'gnomes'.

During the year all kinds of unexpected subjects cross your path. For example, we had the mystery of the new privacy law. This brings me to probably the main thing you learn as a board member. It is not building up a social network and it is not speaking like Obama. No, it is discovering the mysteries you did not expect and handling them, even though you do not want to, just because you once chose to be responsible.

That is basically what the choice of becoming the board of an association means; being responsible. Responsible for the room and everything in it, responsible for the image that others have of the association and responsible for everything that other members do or say in name of the association. Particularly the last one can be somewhat difficult to understand, though it is the most teachable one: learn from each other's mistakes and not only from your own.

I am happy to see that the candidates for the 37th board already started looking for mysteries. With their new function Brand Manager they are going to work (and are probably working on while you read this) on the mystery of how all different kind of stakeholders see our association. I wish them all the luck in the world with solving this mystery and all the other mysteries that will cross their path. I hope they will reach the goals they set for themselves and for the association. Most of all I hope they will have as much fun within and outside of the association as we had!

“ It is not building up a social network and it is not speaking like Obama ”

And while they will be working on the mysteries of the association, I will have my own personal mysteries again. Just like every normal person. Mysteries of life, probably we all have some overlapping mysteries. So let us take a look at each other, learn from each other and most importantly help each other. That brings me to my last and very special lesson I got from GEWIS: do not doubt to ask, because together we are stronger than alone and together we can solve anything we want.



EDUCATION FIRST

As this is my last "Education First!" article of this year, I would like to look back at some of my findings throughout the year. You can probably imagine that a lot happens during a board year and that you get loads of new experiences. (If you cannot imagine that, ask another (former) board member, they will probably agree...)

TEXT Luuk Meeuwis

Looking at what I have done this year as the Educational Officer, this can be summarized by "reading and talking". I know, that sounds stupid, but it actually is very important! Especially the reading part is something that a 'regular' student does not do during their period of studying. But wait: almost all documents that I've read throughout this year are either related to students or even open to read for everyone! Think of the PER/OER or the student statute: these documents are made to be open and clear about the rules and rights for students! But to be honest, I never actually read the whole things before my board year. Did you? Do you plan to? Do you even want to?

I guess that the answer to these questions is 'no' for most of you. That is fine: that's what I'm here for, and what the student representatives of the university are for! But still, it's a shame that not everyone is aware of the rules they have to follow and the rights they have, especially with regards to education. Everyone seems to know the rules to some extent – I still wonder how these rules become clear to everyone just by talking about it – but in the ideal world, everyone would have read these documents and knows their rights and rules, right?

Now here comes another question: how can we encourage everyone to read these (way too long) documents before there is a specific need to? Should we make them shorter, easier to read, FAQ-like? Anything else that can be done?

Speaking for myself, I guess I will be reading them more thoroughly after this board year, since I know

what the preferences could be. But still, planning and actual actions have the tendency to not actually be the same...

“ Never be too shy to talk to your teacher, you will more likely be too shy than too spontaneous ”

Now, on a more personal note: I want to thank you all for this amazing year! As I said, a lot has happened on the island of education as well as at GEWIS. It was awesome to be part of it and speaking to a lot of you and a lot of employees of the university. As a last advice: never be too shy to talk to your teacher, you will more likely be too shy than too spontaneous.

Now it's my successor's turn to represent GEWIS and the students of M&CS. Thomas, I'm sure you will make it an awesome year!

Hope to see you all around. Enjoy your time as a student!





MYSTERIOUS BELIEFS IN DATA SCIENCE

“Lies, damned lies, and statistics” is a well-known old phrase or statement that has supported a somewhat negative image of the scientific field of statistics among the general public, students and scientists. With the rapid increase of data science techniques in the last one or two decades this view on statistics has not changed a lot, while the use of the more computer science oriented techniques receive a much more positive image, almost as if these tools can miraculously solve all data science issues.

TEXT prof. dr. Edwin van den Heuvel (vice dean)

In case I would unintentionally misuse the word mystery, I looked it up in the Merriam-Webster dictionary (online). It provides several definitions: (1) a religious truth that one can know only by revelation and cannot fully understand, (2) something not understood or beyond understanding, and (3) profound, inexplicable, or secretive quality or character. The last two definitions are directly related to research and teaching. First of all, science is progressing because we are constantly trying to increase our knowledge and understanding. We do this often by finding logical explanations for initially seemingly contradictions. One of my favorite contradictions is Simpson's paradox (see the text box for details), since it is related to causal inference, a relevant topic in many sciences. Secondly, we probably all choose our field by its mysteries using it in terms of the third definition. For instance, I chose the field of mathematics, since it is so pure and precise, but later I specialized in statistics due to its practical possibilities and its ability to understand uncertainty (in society) with precise mathematical techniques. Yes indeed, another beautiful contradiction.

On the other hand, paradoxes like Simpson's may confuse students and scientists, and may give them the impression that statistics is unreliable. This probably contributes to a diminished enthusiasm to learn statistics. For instance, when I taught a course

on basic statistics at medical sciences, I often got the serious question why medical scientists should learn about statistics, because physicians will only treat patients. It is like a baker who wonders why calculating and accounting is needed when he or she is just making bread. In my statistics courses at the TU/e, I have discussions with students on why they need to know about the principles of statistics, since big data, machine learning, and the soon to come quantum computing would make statistics fully redundant. This type of thinking is not unique among students alone, it has been supported by scientists (even at our own University).

“Lies, damned lies, and statistics”

This positive feeling about machine learning can be viewed as a mystery. Machine learning has its foundations in statistics and it therefore contradicts somewhat with the opposite feelings about statistics. Secondly, machine learning techniques are becoming so common and accepted that students and scientists start to believe in the phrase “let the data speak”, a quote I used myself in one of my movies for the data science education program. The frequently used



argument is “cross-validation”, a data analysis method that helps protect against overfitting and reduces bias. However, I see papers using machine learning techniques in combination with cross-validation on very small numbers of people (less than 20), but with thousands of data points. The reported average predictive results are accepted as if it is a religious truth applicable to a large population. However, cross-validation cannot demonstrate that the obtained results would remain true on everyone (irrespective of the obtained accuracy performance of the machine learning rules). The number of units is just too small, something you would learn in a basic statistics class, since it may lead to large mistakes on specific individuals. The many ridiculous “personalized” advertisements we continuously receive when we surf on the internet demonstrates my point of incorrect predictions, but does not seem to change our beliefs.

“ profound, inexplicable, or secretive quality or character ”

Don't get me wrong, I support all data science techniques from whatever area they would come, but I am trying to warn for too positive attitudes towards certain areas of data science. Instead we should be critical towards the use of all data science techniques in all settings, like we do for statistics.

SIMPSON'S PARADOX

In the table below, we have reported data from literature on the removal of kidney stones using two different surgical interventions: a new treatment being “percutaneous nephrolithotomy” and a control treatment being “open surgery”. If we calculate the success rates in the overall data we observe that the new treatment (82.6%) is better than the control treatment (78.0%). However, if we calculate the success rates for small kidney stones (with a diameter less than 2 cm) we observe that the control treatment (93.1%) is better than the new treatment (86.1%). The control treatment (73.0%) is also better than the new treatment (68.8%) when it is used for large kidney stones (larger than or equal to 2 cm diameter). These analyses seem to give a contradiction in conclusion. However, the table also shows that the new treatment is more frequently used for small kidney stones than for large kidney stones. Thus, the size of kidney stones affects the allocation of the surgical intervention, but it also affects the success of treatments, since larger stones are more difficult to remove. The size of kidney stones is a so-called confounder, which implies that the analysis on the overall data is incorrect if we wish to study the causal effect of treatment on kidney stone removal.

TREATMENT	ALL DATA TOGETHER			SMALL KIDNEY STONES			LARGE KIDNEY STONES		
	Success		Total	Success		Total	Success		Total
	Yes	No		Yes	No		Yes	No	
New	289	61	350	234	36	270	55	25	80
Control	273	77	350	81	6	87	192	71	263
Total	552	148	700	315	42	357	248	96	343



THREE ERASMUS STUDENTS

You might be used to seeing a single author for foreign student articles, but this time, we got three! Enjoy their stories!

TEXT David Glavas, Elisa Lescarret, Francesca Priante

FRANCESCA PRIANTE

When I first set foot in Eindhoven, I had two different reactions: surprise, and disorientation.

I was surprised by the knowledge of English of everyday life people: everybody could interact with me, also elderly people! I come from Italy, where it's not obvious to find an English-speaking person. And I was also surprised by the well-done structure of the streets: bicycle path – car lane – trees – bus lane, both for left and right directions ensuring a low possibility of accidents or traffic jams; it's a really rational city, as if chaos is not allowed (except for the scooters in the bike path, that was a bit disturbing).

On the other hand, the first days of class I was disoriented, because in the time table it said "instructions" and I didn't know what it meant. Indeed, the first day, I didn't even take my laptop with me, since I usually don't use it in class in Italy. Well, then I discovered that the education system was totally different from what I was used to. I was used to work



alone, mostly studying the theory that had been covered in class, with no homework, no assignments, just a final test after 5 months. In Eindhoven I learned the art of working in groups and trying desperately to finish everything before the deadline.

A funny "psychological" fact about my stay in Netherlands is that when in November we had a sunny day after weeks of cloudy or rainy days, I realized that it had been a long time since I had seen any shadows. When it's cloudy, the light is diffuse, shadows disappear, and everything is the same, and I remember that I thought "Oh my god, that's a shadow!". I found it pretty weird and funny: I missed the sharp shadows that the sun projects more than the sun itself.

DAVID GLAVAS

My semester as an Erasmus student at TUE is 1 year away. 6 months from now. 3 months left. Only 1. Next Monday. Tomorrow. This is my first week. It's been a month. Christmas holidays are over. I have 1 month left. I leave next Wednesday. Today is my last day. I'm back home. I spent 5 months as an exchange student at TUE.

In the next few paragraphs I'll try to give you a glimpse of the student life at TUE from the perspective of an exchange student.

It all started with the introduction days. I remember the feeling of entering Flux and seeing it full with friendly and open minded Erasmus students – I immediately felt welcome. We exchanged kind words and numbers over coffee and tea. Then everybody quickly finished their drinks and gathered so that the pub crawl could start on time – it was 16:00.



I come from Munich and am moderately acquainted with beer. But this pub crawl, phew. There were a couple of GEWIS people (shout-out to Rick Wouters, Eindhoven's living encyclopedia) guiding us from bar to bar while proposing neat games for entertainment. After that day, there were multiple introduction-like days with mini-pub crawls, games, BBQ's, and presentations from more senior staff who welcomed and gave us a quick crash-course on Dutch culture. These events were such a nice place to meet Dutch and Erasmus students – many groups that formed during this time remained in touch during their whole stay at TUE and afterwards.

Things I learned during my first week: I like Dutch people and Erasmus students, never buy a single beer, I can't count the number of bars on the TUE campus with my fingers, study associations like placing their stickers as high as possible on whatever they won't get punished for placing a sticker on – walls, lamps, my forehead. Overall, the introduction was better than anything I could have dreamt up – whoever organized this deserves a promotion.

During the first weeks I spent most of my time socializing with other Erasmus students. I enjoyed cycling in Eindhoven, I can't stress enough how much I prefer riding my bike on dedicated lanes – looking at you Munich – instead of using a car or public transport. I enjoyed the silly nights out that mainly consisted of parties at Stratum (oh boy) and the occasional concert at Effenaar. I enjoyed travelling to

other cities with NS's Groepsticket, dinner parties with other students, and occasionally embarrassing myself at the foosball table while trying to show-off at the Gewis bar – those guys are nuts.

Then courses, assignments, and other obligations started. The courses I took were well structured, the students were friendly, and the professors very helpful. All courses I took were taught in English and I didn't feel the slightest disadvantage due to not being able to speak Dutch – I still took every chance I could get to embarrass myself while trying to pronounce Dutch words. What surprised me the most is just how helpful professors were – I especially liked courses offered by TUE's algorithms group (shout-out to Kevin who endured my countless questions after lectures). The amount of expected work was manageable, the assignments and exams were many but fair. Thankfully, there was enough time for social events in-between the coursework (or was it the other way around?) which made studying so much more rewarding.

Overall I enjoyed the stay. I'd like to thank all TUE students and staff for being so open towards exchange students and making us feel welcome. At last, to all Erasmus students who contributed to the sweet memories that keep cheering up my day whenever I remember them. For all those little moments that have fallen into the sofa cochins of time. All the priceless conversations, and breathless laughing fits. Thank you.



ELISA LESCARRET

Before going to the Netherlands, my experiences of traveling were... How can I say that? Well, "simple" should be a good word for this. I had only been on trips with my family or to summer camps. So, I had never traveled completely alone.

When I arrived in Eindhoven, I was afraid because my English was bad. But I still tried to give the best of myself. Many "introduction" activities were planned by Cosmos and GEWIS. That was nice and they allowed me to meet many foreign students. A really good idea of Cosmos was the pub crawl. What can be more efficient than alcohol to help people to talk to each other?! Thanks to those events I met a lot of foreign students and my buddy from GEWIS who helped me with all the things to know about living in Eindhoven.

With those people including my buddy, we decided to travel around the Netherlands. In fact, it is not so expensive to travel in the Netherlands when you are with a big group. I will even say it is particularly cheap!

The first trip was to Delft. A nice not too big city of the Netherlands. It was the best place to start traveling with the group, because there were not too many things to see there: ceramics, beautiful streets with the canals and the university of Delft which was impressive!

The next trip was Utrecht, to me it is the most beautiful city of the Netherlands. We tried the "free guided tour",



this is not completely free, you can give some tips at the end, it is worth it! Three hours of explanations about the city and its history. An interesting experience! We have also climbed the tower of the city, where at the top we had a view over the whole city.

Many trips came after: Amsterdam, Den Haag, Rotterdam, Maastricht... We have also visited some city of the surrounding countries: Brussels, Aachen, Bruges... So many beautiful and interesting places!

This journey to the Netherlands taught me something: don't wait to travel! Money, time: they are just excuses for you to not do what you really want. So, just take your bag, find some friends, and let's go!



WHERE MYSTERY MATTERS

Once upon a time, in a land far, far below sea level there lived a very industrious people. A nation originated from savages and fishermen, they turned their attention to the sea: exploring the world, pushing back the fog of the unknown and in their wake fleets of merchants brought back seemingly infinite wealth. The men were made of iron and the ships of wood, the principle on which their enormous navy was built, conquering the elements as well as the world.

TEXT Yoram Meijaard

Unsurprisingly, the world was not enough, for their small country was full, the fields could no longer supply enough food. All possible expansions over land implied immediate devastating war with the (much stronger) bordering nations. In dire need of a solution, they turned their eyes south and found a man with a plan. Leeghwater, with a not-so-coincidentally appropriate name, created an ingenious plan to drain the sea. When the first mills started turning and new fertile ground emerged from the depths, a saying was born: "God created the Earth, but the Dutch created Holland".

Besides the obvious awesomeness that is 'draining the seas', this engineering legendarium carries a lesson for us future engineers: Leeghwaters work was incredibly visible. Even now, hundreds of years later his work draws admiration, the windmills are still there, to be admired by thousands of visitors annually, celebrating one of history's greatest engineering feats. Universities as ours cannot exist on their own, for the knowledge creation process is costly and should not solemnly depend on their own profitability to exist. In times gone by this was no problem, "verzuiling" implied guaranteed governmental support, no questions asked. However, times are nothing if not changing and our ivory tower of near universal knowledge nearly is slowly collapsing due to underfunding.

Who is to blame? The politicians, whose incompetence results in degradation of degrees, in universities collapsing and students drowning in debt? Is it the

public, whose increased indifference to societal matters leaves the public debate dominated by fake news and unfounded opinions? Despite its ease, there is no merit in scapegoating. As a great fictional man once said "To find those responsible, you only need to look in a mirror."

How could we ask for more financial resources when the public does not know what we do with it? How can we deliver Eindhoven engineers when students and society live completely separated lives? Why would any politician care for us, if they never interacted with any STEM scientist in their life? Yes, science is difficult and we cannot expect the world to understand and appreciate the fine details of group theory, nor can we expect them to find any interest in your new favourite programming language. However, we could at least make our results more accessible. Show the world what we do and why we do it. We could print the source code of the Linux kernel, demonstrate cryptographic systems and plot various formulae in large on the floor of the Markthal. A science fair, where our entire university opens up her wonders to the outside world. Drinks can be shared, whilst the wonders of academic life spread throughout all layers of society. It would be a visible display of engineering, surpassing the days of old.

COLUMN





THE COMPLEXITY OF AUTOMATED WIRELESS CHARGING

How fully integrated software supports the transition of the automotive industry to an electric future, through the comfort of wireless charging.

TEXT Prodrive Technologies

At Prodrive Technologies we develop and deliver a wide range of highly competitive products, systems, and solutions which employ techniques that are highly efficient and often unique to Prodrive Technologies. We develop products for virtually every conceivable market in-house, using the very latest process techniques; most of which we have developed ourselves. As a result of this innovative approach, we are among the fastest-growing technology companies in Europe.

On average 50% of our design team is focused on (embedded) software development. Our architects and designers are part of many small, efficient and fully autonomous teams that are guaranteed all the facilities they need. These teams accomplish the research and development for our client's systems by utilising our state-of-the-art laboratory. Our average age is 28 and our part-time students, interns, and graduates all equally contribute to our success.

Almost two years ago, Prodrive Technologies started the development of an automatic wireless charging system (AWC) for electric vehicles. It eliminates the hassle of cables and plugs to charge the car battery.

In general, the system consists out of three main components:

- » A wall box mounted on the wall.
- » A ground assembly located on the (garage) floor.
- » A vehicle assembly mounted in the vehicle.

The wall box and the ground assembly run Linux as their OS. The vehicle assembly runs AUTOSAR, a software architecture specifically designed for automotive applications, which is currently the standard within the automotive industry.

The complexity of the system can already be seen by looking at the external interfaces involved:

WiFi - Used as access point while connected to the customer's home area network as client. Allows the user to configure the system via its web interface, hosted on the wallbox.

PLC - (power line communication) - Used to discover energy managers and smart meters. The PLC provides real-time information regarding the main's power limitations to ensure that the system does not cause a blackout at the customers' household.

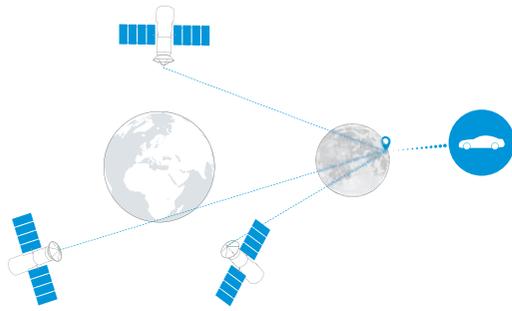
WiFi - between ground and vehicle assembly - Based on developing standards to prepare for future interoperability.

CAN - Used to communicate between the vehicle assembly and the vehicle's on-board network. The vehicle assembly requires full integration in the car's CAN network.

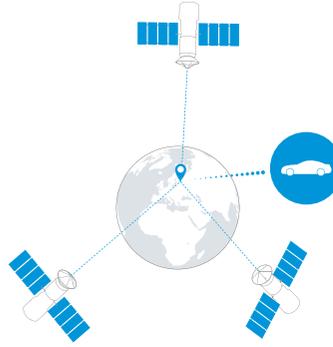
The core functionality of the system is charging. Yet to ensure high-efficiency charging, the vehicle needs to be aligned within certain limits of the ground assembly. Therefore, a vehicle guidance system (positioning) is a core part of the AWC system's



0



1



0

POS (Located on the moon)

1

GPS (Located on earth)

functions. Next to this, the safety of the user and the system is guaranteed using two integrated safety-systems.

Our living object safety-system monitors the surface of the ground assembly using a network of sensors. A sleeping cat, or human limb above the ground assembly, must be detected to interrupt charging. This safety feature prevents exposure to the magnetic field between the ground assembly and vehicle assembly. When the cat leaves, charging automatically continues.

Inductive heating of metal objects on the ground assembly should also be prevented, as these objects may cause damage to the ground assembly surface by induced heat. Here lies a big challenge. Small metal objects need to be detected, whilst the metal of the vehicle above remains ignored. And one must not forget that this environment is rather dynamic.

False positives of the safety-system should be avoided as this requires user interaction and lowers the comfortable functioning of the system. Having to walk to your car after one of the safety systems is triggered is considered to be a similar hassle to plugging in a cable.

The vehicle guidance system (POS) is developed to help the driver align their car to the optimal position above the ground assembly. The position of the ground assembly with respect to the vehicle is visualised on the vehicle's display and can also be used to automatically park above the ground assembly. The challenge for positioning is locating something that

is outside the area encircled by antennas or beacons (with sub-centimeter accuracy). As an analogy; instead of locating an object on earth using GPS satellites, use those same satellites to locate an object on the moon.

Apart from these functions, there is also a connection to the household energy manager to ensure that the main fuse does not trip whilst simultaneously charging with 11 kW, and switching on your induction cooktop. That charging limit can be manually configured in a web interface or dynamically controlled by an energy manager. Other functions of the web interface include: managing charging statistics and multiple vehicles, updating firmware, etc.

As a reader you can probably imagine the amount of software required to achieve all of these functionalities. Furthermore, the diversity of our software challenges is very broad; ranging from VHDL code (low level embedded) to a web-interface (application). The necessary software development includes: bootloaders, FPGAs, internal networking, system diagnostics, code generation from control models, (secured) flash partitioning, data storage, web development, security, etc. Typically used software tools are: MATLAB Simulink, Visual studio, Vivado, Vector automotive tooling, etc.

Most of the software running on our system is developed in-house at Prodrive Technologies and it doesn't stop there. Tools for the development, and production of such a system are often developed in parallel to produce, validate and deliver this innovative product to our customers.





DON'T JUDGE A BOOK BY ITS COVER

“Margo always loved mysteries. And in everything that came afterward, I could never stop thinking that maybe she loved mysteries so much that she became one.”

TEXT Nadym van Schaik

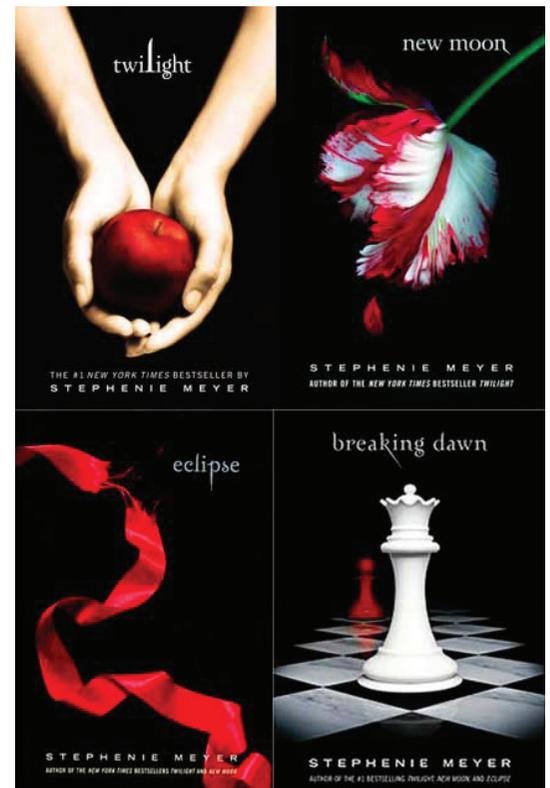
Some will recognise the quote above, some won't. If you don't recognise the quote, will you be interested in reading the book in which this quote appeared? On which criteria would you decide whether you want to read it or not? The first thing you get to know is the title of the book. Some titles are more straightforward than others, and those cryptic titles won't tell you a lot about the plot (if you are unlucky).

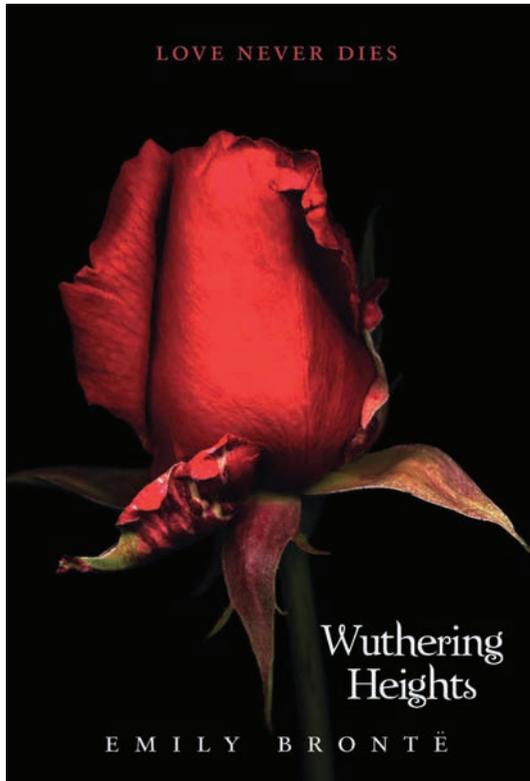
Another well known piece of information about the plot is the small text in the back of the book. But, the same as with book titles, some give you more information than others. One of the most commonly used criteria to decide what to read are other people's reviews. Let's say that 100 people have read the book you are currently thinking about reading. You would be more likely to read the book if 80 people were positive, than if 80 were negative about the book. We value other people's opinion, and if the majority thinks a book is a pile of crap, you will probably think it as well.

However, nine out of ten times, we judge a book by its cover. And I'm not saying I don't agree with you, because I do the same. The more beautiful the cover, the more likely the story will also be awesome (won't it?) But to be honest, should we judge a book really based on what it looks on the outside? Some amazing stories have the ugliest cover, and the other way around.

TWILIGHT MAKEOVER

For example, a couple of years ago, the Twilight saga by Stephenie Meyer was one of the most popular books (if not the most popular one) among teenage girls. Every girl between 12 and 16 had read the whole series over and over again, and then ended up in a reading slumber because no book series could match Twilight. However, soon all those girls would have a new book to rave about. Publisher Harper Collins published a book called Wuthering Heights, which looked like Twilight 2.0. Most girls had never heard about this book, but since the cover was almost identical, the books would also be identical. Well, no.





As you can see, the “new” American cover of Wuthering Heights shows a red rose against a black background, and has a classic curly writing on the cover. Compare this cover to Twilight, and the similarities can easily be found. However, the writing itself couldn't be more different. While Twilight is a YA book to its core, Wuthering Heights is classic literature. In my opinion, it is disgraceful to give Wuthering Heights a Twilight makeover, just to boost the sales (because that is what's happening here). And I'm not saying that those teenage girls who adored Twilight won't like Wuthering Heights. But changing the cover to give the impression of two very similar stories, while they are in fact quite different, is pathetic. Unfortunately, Wuthering Heights is not the only victim of a Twilight makeover, since then, Pride & Prejudice and Romeo & Juliet have met the same fate.

BLIND DATES

The example above shows that even though Wuthering Heights is a great story, some of the covers out there are not great. Wuthering Heights is not alone, and there are many great books who have ugly, bad, or misleading covers. And all those books are part of the reason why those books are left behind in bookstores.

Or maybe the cover caused the book not to have the publicity it would have received when it would have gotten a great cover.

Let me introduce Elizabeth's Bookshop in Australia, who came up with Blind Date With a Book. The bookstore wrapped up misunderstood books, and covered everything that would give the title away. Suddenly, people were not able to read the short description in the back, or judge the cover. Instead, they were tagged with clues about the book inside. That way, the reader didn't know which book he/she held in his/her hand, but could decide based on the tags whether to read it or not. The books were not from one genre, and books about mystery, romance, horror and fantasy could be found lying next to each other.

The idea of tags might be a little weird, but compare it to being someone's wingman. Let's say you have a great friend, and you are going to set up a blind date for him/her, how would you introduce your friend? You can hardly tell his whole life story to his date, or at least, it's not advisable. You would probably say something like “he is tall”, “he likes to go outside” and “he is an great person to talk to”. The date will probably then decide whether to like your friend based on the descriptions, even though you haven't told her everything. Tags work the same, it tells you a bit about the book, without laying the whole plot out in the open.

From one day to another, book shop owners started to collect their favourite misunderstood books and wrapping them up in brown paper. The hardest part: finding a couple of tags to write on the wrapping paper, without giving the book away but also without being too cryptic. I've tried to do it with one of my favourite books, but couldn't come up with more than romance and lovely world building. But as hard as it might be to find the perfect tags for a book, it is amazingly satisfying to know the many lesser known books will be picked up by curious readers, just because one book shop started to wrap them in paper. My advice: do a blind date with a book. It's a unique experience and you probably encounter some hidden gems you've never thought of reading.





THE TWO FACES OF GEMOLD

Secrecy... Dillusion... Backstabbing... When you ask someone about their experience with the GEMOLD weekend you will either get these words, or the even less comforting: "Nothing's what it seems". A weekend where everybody puts on their best pokerface, most mysterious mask or shows no face at all. What is this weekend all about? What am I talking about? Welcome into the GEMOLD weekend...

TEXT Jeffrey Minten - GEMOLD18

GEMOLD is a weekend in which the Dutch TV-show 'Wie is de Mol?' is recreated. In this weekend there are twelve contestants with the common goal of earning as much money as possible via participating and succeeding in various games. That is, if everybody indeed participates... There is one saboteur known as 'The Mole', who tries to sabotage the games, which results in the loss of money instead of earning it. You better have an understanding of who the mole might be, because it may affect the length of your weekend, and thus the chance to earn money. But us mathematics and computer/web science students of course know how to play strategically, right? Right...?

In GEMOLD16, I had the privilege of being among some very persistent contestants; another thirteen to be precise. I guarantee you that being put in a room and being dropped with a bunch of 'unknowns', immediately results in a rise of distrust. You constantly need to have your eyes peeled for sudden movements or 'dumb' mistakes that other contestants make. Because you can perceive someone's mistake either as an action that the Mole would make, or as an action out of individual thought, your brain will be on focus 24/7. This combined with keeping track of your own strategy, results in even forgetting what you had for breakfast. Being a GEMOLD contestant is about living in the present. Forget the past, forget the future, it might be over soon...

During the weekend I made it to the final three alongside Marco and Rik. Let's say the outcome of this final was very surprising. I'll leave that as a question

left for you to answer. And I kept dabbling in the peculiarity of GEMOLD as well, because after this weekend it was not yet over for me. I got accepted into the GEMOLD17 committee which allowed me to further witness the mystery going on. Because you might understand that being part of the committee comes with its own mysteries.

“ Let's say the outcome of this final was very surprising ”

Being on the overview of the game gives new insights of how to play. Instead of having your own thoughts all the time, you wonder about what the thoughts of the contestants are. Having played the game before, I know what the group dynamic is, but I couldn't imagine what everybody's mindset was. When you organize the weekend you have a very clear idea of what everybody thinks, and thus it becomes very interesting to follow the whole game. I also found out that trying to predict the outcome of the game was definitely a waste of time. You might know everybody's state at any given time, but everything changes every second.

GEMOLD has two faces: knowledge and gut feeling. On the one hand you have the facts that lie around, ready to be picked up. On the other hand, it's the lies that you may see as the facts. You better know where to draw the line, and whose facts are the truth. Better participate before the mystery is gone...

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.

Wesley: "Ik eet altijd frietjes na het zwemmen"

Niekie: "Dat kan bij de Hubble!"

even later

Niekie: "Ik doe altijd poepen na het zwemmen."

Jos: "Dat kan bij de Hubble!"

**Ingmar is dronken en steelt toiletpapier **

Wesley: "Nee, ik hoef geen toiletpapier"

Emma: "Stop nou eens met grapjes maken over TBK!"

Arend: "Jij hebt geen bier nodig! Je bent gewoon nu al kut!"

Joeri B over Iris K: "Ik heb mijn halve durum aan een dronken, hongerige Aziaat gegeven."

Gijs: "Is het song festival ook dit jaar?"

**Bart hoort een kind huilen **

Bart: "Ja gewoon opstaan en weer doorlopen ik probeer hier van mijn bier te genieten."

Gijs: "Ah, het is al lang geleden dat ik Henk Jan heb gedronken."

Tom V: "Weet je nog die ene multiple-choice vraag?"

Kees: "Alle vragen waren multiple-choice."

Ilse tegen Lars: "JE MOET HELEMAAL NIKS, JE BENT EEN VROUW!"

Arend: "Soms staat goede opvoeding in de weg van warm eten."

KutJeroen: "En vier plessen fsosecco! "

Ralph tegen Stefan over hoe Stefan de kabels van het B.O.O.M. logo heeft weggewerkt: "Je had het logo wel wat beter kunnen wegwerken!"

Onbekend: "Als kerstavond de dag voor kerst is, dan is zondagavond ook de dag voor zondag toch?"

Niekie: "Wat is gehakt?"

Bart: "Wie heeft er nu weer kutmuziek aangezet? Oh, het is gewoon Zoutelande"

Ian: "Ik ben nooit naar de hoeren geweest, ik vertrouw ze niet man"

Laura K tijdens het praatje van de ouderdag: "Tijdens de pauze kun je hier lekker komen borrelen!"

Herman Geuvers: "Heet de vrouw van Prokert Anna-Liese?"

Bor: "In wat voor universum leven we als zelfs buitenlanders mijn randstedelijke accent belachelijk gaan maken?"

Arend appt Maureen: "Maureen wat is je telefoonnummer??!"

Twan: "Doe jij even delen, dan kan ik aan mijn ijsje likken."

Tim Woodhouse: "Eerlijk gezegd, ik ben hier al eens eerder geweest."

Esmée tegen Tom: "Jij vindt jezelf wel leuk, hè."

Tom: "Ja! Zal ik een relatie met mezelf nemen?"

Leroy L: "Bovenop zitten is ook niet alles, dan wordt je alleen maar van anderen geprikt!"

Student tijdens het college 2WA70: "Meneer, we kunnen u nog horen."

Rick W: "Ja, weet je, computers zijn goedkoper dan vrouwen."





COMMITTEE

M&MYSTERY

Each General Meeting GETAART presents some delicious cakes for you to eat. When you see these finished products that tingle your taste buds, you can let your imagination run wild with how these cakes were made. You can try to guess what steps were taken, how many hours were spent preparing the batter, how much chocolate was already eaten before it went into the cake, how many apples went into the filling, how long the cake would have to rest in the oven, and so on.

TEXT Leon Deckers & Dionne Heuvelman - GETAART

While most of these cakes work out well and leave you craving more, it can happen that a cake just doesn't work out. Even while following the recipe to the letter, things can go wrong. Some people might remember a certain "arretjescake" that was as solid as a brick, and people literally broke their teeth while trying to eat it.

During last Election GM (163), again a lot of different cakes were made. Each with its own secrets on how to bake it. Here we will help you solve the baking mystery for one of the cakes that you may have eaten.

INSTRUCTIONS

TO MAKE THE CAKE

1. Preheat the oven to 160 degrees Celsius.
2. Mix the butter, sugar and vanilla sugar in a large bowl. Add the eggs and beat about 2 minutes on high speed to make it fluffy.
3. Add the flour and cocoa and mix it all together.
4. Prepare a springform pan by putting parchment paper on the bottom and greasing the sides. Bake one third of the mixture for about 30 minutes. When you put a toothpick in the cake and it comes out clean, the cake is ready.

INGREDIENTS

CAKE BATTER FOR BISCUIT CAKE

- » 600g sugar
- » 3 packages of vanilla sugar
- » 600g butter
- » 12 eggs
- » 150g self-rising flour
- » 150 g cocoa powder

FROSTING

- » 100g butter
- » 400g cream cheese
- » 2 teaspoons vanilla extract
- » 500g powdered sugar
- » 8 Oreo cookies

FILLING

- » 350g M&M's

DECORATION

- » 200ml whipped cream
- » 200g dark chocolate
- » (small) Oreo cookies

5. Repeat step 4 two more times, so then you have three cakes. Let the cakes cool completely.

TO PREPARE THE FROSTING

6. Beat the butter until it's smooth. Add the cream cheese and vanilla extract and mix it again until it's smooth.

7. Then add the powdered sugar in small portions and mix carefully. It helps to stir carefully first, which prevents the sugar from spurting.

8. Crush the Oreo cookies completely (for example in a food processor). Then add them to the mixture and stir.

TO BUILD THE CAKE

9. Once the cakes are cool, level them with a knife.

10. Place the first cake on a big plate and evenly spread three tablespoons of frosting on top. Leave a

circle in the middle without frosting, this is where you will put the M&M's in the next step.

11. Make a hole in the middle of the second cake with a diameter of about 10 cm. Put this layer on the first one, and spread another layer of frosting over the cake.

12. Fill the hole with M&M's, and put the third cake on top.

13. Cover the entire cake (the top and the sides) with a thin layer of frosting and pop it in the fridge for a minimum of 30 minutes.

14. Afterwards, divide the rest of the frosting equally over the cake.

FOR THE DECORATION

15. Pour the whipped cream in a small saucepan and heat it till it begins to boil on the sides.

16. Put the chocolate in pieces in a heat-resistant bowl. Add the whipped cream. Then stir till the chocolate has melted completely.

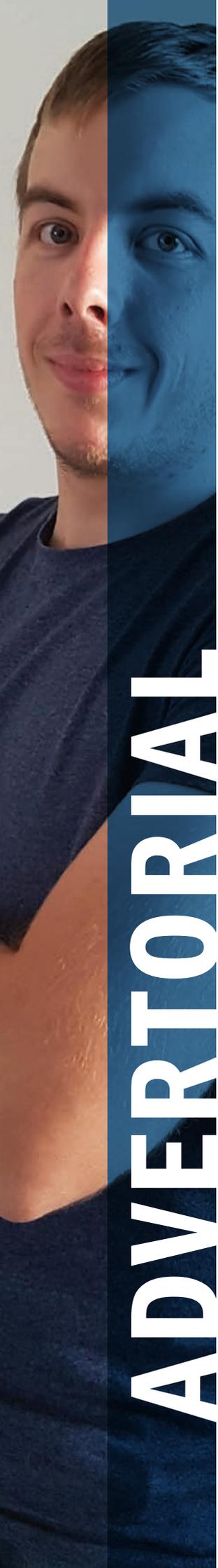
17. Let the ganache cool for around 30 minutes and stir regularly.

18. Put the ganache in a sandwich bag and cut off a small corner (about half a centimeter). Spray the ganache on the edge on top of the cake, and occasionally go over the edge to get a nice "drip". Cover the top of the cake with the rest of the ganache.

19. You can decorate the top of the cake with Oreo cookies.

20. Now put the cake in the refrigerator till you want to eat it. (Spoilers: it will spoil in a few days, so don't wait too long with eating it.)





ON TELEVISIONS, CASTLES, AND CYBER SECURITY

Television is a great medium that has been around for decades. Somewhere in the 1990s, TVs were large, bulky devices that produced sound and displayed images by bombarding a screen with electrons. They had a limited set of input channels (cable and specific interfaces for external devices) and could be controlled using either the on-TV buttons or a handheld remote.

TEXT Robert Seepers - TNO

As technology progressed, televisions have become entertainment powerhouses capable of displaying content from a wide range of sources (cable, gaming consoles, USB sticks, the internet, etc.). Smart TVs offer direct internet connectivity, which may be used to download or use cloud-hosted TV apps, perform TV-firmware updates or simply browse the internet. Moreover, there are many, *many* ways to control modern TVs including movement-based controls, voice activation, smartphone apps that communicate through WiFi and internet. Your TV has never been more connected.

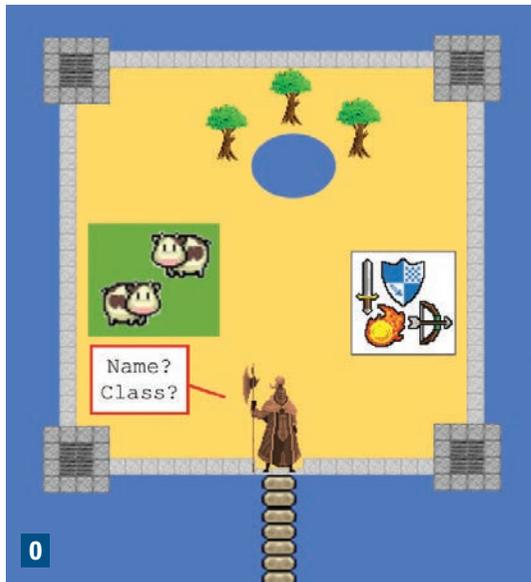
Why do I tell this story? Because our desire to connect everything and be online yields one of the crucial challenges in security architecture. You see, traditionally, security has been about keeping the bad guys out: Castles had one (or a few) gates through which weary travelers could enter; Walls, guards, moats and draw bridges kept them out otherwise. This concept of security works fine as long as there are only a few points of entry and all assets are kept within your castle. However, if you keep introducing new ways to enter your castle, or decide to move some of your assets to a friend's castle, it becomes more and more likely that bad guys will get their hands on them. It comes as no surprise that modern televisions are prone to many cyber attacks.

One can also observe the trend of "connect everything everywhere" in a typical organization and their

infrastructure. Modern organizations are moving their apps and data to the cloud, allowing data and services to be accessed from various locations. Organizations increasingly employ temp and flex workers that may work from any location using their personal computing systems. Moreover, organizations rely more and more on their IT solutions as part of their business, making them an attractive target for advanced cyber attacks. Once adversaries make it past the initial perimeter (the "castle wall"), they may typically move freely through an organization's network without being detected for months. Security architectures have not kept up with the high dynamicity of both organizations, IT and attackers in general.

So, what can we do about it? In the cyber security & robustness group of TNO we are researching and developing new cyber-security concepts and paradigms, one of which is an *advanced security architecture*. This architecture relies on a number of design principles, such as *assume that your perimeter will be broken* and *zero-trust*, to both *reduce the attack surface* and *prevent lateral movement*. Specifically, we try to achieve this through:

- i. *Isolating* the various components in a (security) architecture from each other into distinct *security zones*. A security zone could be any construction that isolates certain functionality (or data) from other zones. For example, you could assign all different computers to their own unique zones (network zoning).



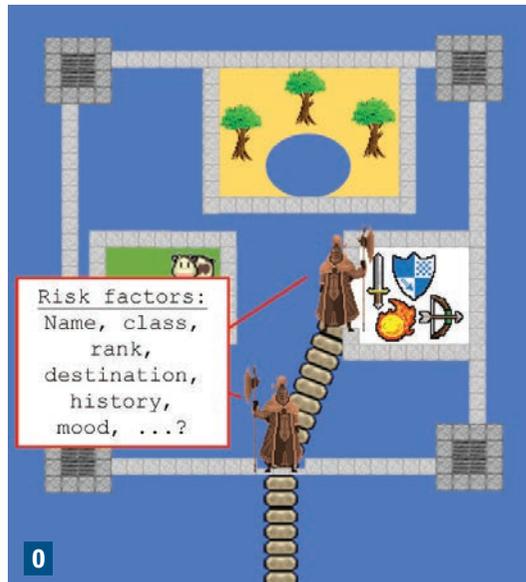
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Castles secured according to the most commonly employed security-architecture paradigm, which bases its security primarily on having a

Or, you could apply zoning on the application level: Your internet browser and latex editor could be different zones that can, by default, not communicate with each other. By securing each individual zone, the architecture's security becomes less dependent on its perimeter.

ii. Facilitating connectivity between these security zones exclusively when required (*on-demand connectivity*). That is, it is not uncommon for different functionalities (applications) to exchange data; for example, you may wish to copy certain data from your internet-browser zone (Wikipedia) to your text-processor zone (when working on thesis.tex). On-demand connectivity ensures that these zones may interact with each other only if so desired and deemed acceptable.

iii. Performing *dynamic risk management*. That is, actions within the architecture are only allowed if the risk associated to that action is deemed acceptable. To keep with the aforementioned example, the risk of having you visit Wikipedia from your internet-browser zone on your own laptop is likely minimal and acceptable. On the other hand, if you were working on some high-tech and confidential project, you would probably have to take several risk-mitigating measures (such as using a VPN and having a provably malware-clean laptop) to yield an acceptable risk. Measuring such risks – and deciding what is acceptable – is



1

Castles secured according to the new security paradigm in development by TNO, which: (i) isolates the castle's interior into distinct security zones; (ii) facilitates connectivity between zones only when required; and (iii) makes access decisions to these zones based on the actual, measured, risk.

essential to keep up with the high dynamicity of IT and attackers.

There is a wide range of choices and trade-offs to be made to implement the architecture that relies on the above principles. For example, should a security zone be implemented using docker containers or specialized separation kernels? How could we set up connectivity between these zones using network protocols and functions such as IP, VPN, software-defined networking or network-function virtualization? How are we going to gather all the information to perform automated, dynamic risk assessment? And how can we model what the actual risk associated to an action is?

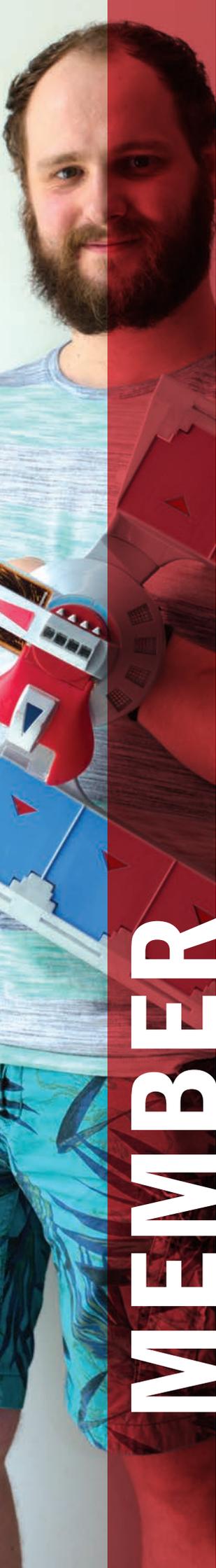
TNO (Netherlands Organisation for Applied Scientific Research) is an independent research organisation in the Netherlands with a focus on applied research. The cyber security & robustness group currently comprises roughly 50 researchers, consultants and advisors, and 10 MSc students with a diverse background including mathematics, computer-science and -engineering and embedded systems. Would you like to know more about our group and/or work on one of our exciting research topics as a full-time employee or for your MSc graduate project? Visit our website:

[TNO.NL/career](https://www.tno.nl/career)

Contact:

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MEMBER

I SUMMON: DUELISTS!

Everyone has this one thing from their childhood which they cannot seem to shake. Most often, it is not one thing, but rather multiple things, and every time you see one of these things you get overwhelmed with nostalgia and feel a certain kind of happiness. Some of these things do not seem strange. For other people, however, it is more difficult to be open about their childhood nostalgia. People who like Pokémon often get strange looks, but these people have the advantage that they are not alone. My childhood nostalgia however is not as mainstream. My childhood nostalgia is the game of Duel Monsters, more commonly known as Yu-Gi-Oh!

TEXT Wesley Brants

Yu-Gi-Oh! (which is Japanese for “King of Games”) is a trading card game from the late 90’s, and became popular in the Netherlands between the years 2000 and 2002. In these years, you were not a cool kid if you did not own a Dark Magician. On the playground, in every break, people would bust out their playing mats to duel each other. It is a simple game in which you can summon monsters, sacrifice weaker monsters to play stronger ones, and create genius strategies using monster effects, spell cards or trap cards. There were manga’s, there was an anime, there were movies, there were tournaments, there even were these little plastic bottle-cap-like flippo’s you could collect in packet of crisps (named chaps). I loved everything about it. The game and tournaments, the strategies, opening booster packs and the anime. Now, 15 years later, I still love the game and have 15 decks ready for playing.

LET’S DUEL!

The game as described above is simple, but can be very deep with all the possible strategies out there. Over the years, many new kinds of cards have been introduced which also introduced many new rules and many new ways to play. (Some warning, if you have never played Yu-Gi-Oh! before, some terms might be strange, sorry).

In the beginning there were, in addition to your basic kinds of monsters, spells and traps and also some special monsters. One could fuse two monsters

together, or one could sacrifice specific monsters to summon a ritual monster. In the years which followed, new kinds of cards were introduced. First, a lot of themed cards were released, which if put together in a deck made each other stronger. There were the crystal beasts, the elemental heroes, the ancient gears, you name it. Of course, you could mix the monsters together or use them stand-alone.

BE IN SYNC

At some point, a silver card was introduced. This was the dawn of the Synchro monsters. To summon these, you need a special monster named a Tuner monster. If you sacrifice it along with other monsters, you can “Synchro Summon” it. Of course, there is some strategy here. Each monster has its own level. The trick here is to sacrifice monsters (and at least one Tuner) so that if you add up the level of all monsters, it is exactly the level of the Synchro Monster you are going to summon. Easy right?

BUILDING OVERLAY NETWORKS

But that’s by far not the end of it. A few years later, black cards arrived at the game. These are called Xyz-monsters (pronounce: Ek-seez). To Xyz-summon a monster, one must sacrifice (or “build an overlay network”) the monsters according to what the card says (for example, 2 monsters of level 4). Now, the monsters you sacrificed do not go to the graveyard, but are used as Xyz-Materials, which are put



underneath (in the game it is called: attached to) the card. Some Xyz-monsters have an effect which can be activated by removing one of the materials. These effects are powerful, but you can only play them for a limited amount of time.

PENDULUM, PENDULUM, PENDULUM

We are almost caught up, because after this, the Pendulum monsters were introduced. These monsters are half monster, half spell card, and can be played as usual (as a monster), but also as a spell card in the special "Pendulum Zone", of which you have two on the field. Each Pendulum monster has a Pendulum Scale, and if you have activated two Pendulum Monsters in your Pendulum Zones, you can Pendulum Summon as many monsters as you want as long as their levels are between the Pendulum Scales of the Pendulum Monsters in the Pendulum Zone. Easy, right? There is a lot more about these monsters, but their rules are hard to explain without a full tutorial, especially considering the hours of YouTube videos that are made about them. So for the sake of the people who have not stopped reading yet I will spare these details.

LINKING THE FIELD

The latest addition are the Link Monsters. The Link-cards are all based on the cyber world, and have a lot of names referring to computer science terms. The Link-monsters can be summoned in a similar way to

the Xyz-monsters, but the sacrificed monsters now go to the Graveyard. However, you can only have one Fusion, Synchro, Xyz or Link Monster on the field at a time. This takes away the overpowered monsters, which you could easily fill up your field with in the past. However, Link Monsters have arrows around the cards which are pointing to other zones on the playing field. Not only Link monsters have an effect based on the amount of cards they point to, also if a Link monster points to a zone, it is allowed to place a special monster there (so a Fusion, Synchro, Xyz or Link monster). This way, the location of where you place your cards is more important than ever, giving a whole new aspect to the game.

TIME TO DUEL!

I wrote this article in the hope that there are more duelists out there. If you are one, please get in touch with me. If you haven't played in a while and do not have all these new kinds of cards, that is cool as well, it is easy to leave them out. Basically, every paragraph in this article is a game mode. If you choose a game mode you can use all cards up to that kind (tournaments are made up with this planning as well). So if you choose Pendulum, you can play with Synchro, Xyz and Pendulum monsters, but not with Link-monsters. So, if after reading this article your childhood nostalgia got you itching for some good duels, dust of your duel disks, 'cause it's time to DUEL!





THE DARK SIDE OF DATA SCIENCE

This is a review of the book “Weapons of Math Destruction: How Big Data increases inequality and threatens democracy” by Cathy O’Neil (Allen Lane, 2016). If you want to learn about social responsibility of mathematicians, and see a mathematician taking it, look no further. To paraphrase the well-known quote from Multatuli’s famous character Batavus Droogstoppel: This is a book you need to read if you are going to be a data scientist, or if you are going to be anything else.

TEXT dr. Georg Prokert

In view of the readership of *Supremum*, I do not need to explain the role, the appeal, and the importance of Data Science and the corresponding Big Data technologies in the economy and society of the present and the future. Excitement and expectations are characterized by slogans like “datasets are the new resources, like gold and oil in the past”, or “data scientist is the sexiest job of the 21st century.” For more, let me just refer to the video annoyingly playing non-stop next to the lift on the 7th floor in *Metaforum*.

So, what can go wrong? Actually, a lot. And it already does. Precisely this is the topic of the thrilling, well-researched, and surprisingly readable book under review. As for its relevance: if I would have a say in this, I would strive to make the book compulsory reading for any Data Scientist graduating from our BSc program.

“ Weapons of Math Destruction ”

Before trying to explain and justify this, let me say some words on the author: Cathy O’Neil obtained a PhD in algebraic number theory from Harvard. She taught at a top college and worked for a large hedge fund before she became a data scientist for various

companies. Currently she teaches Data Journalism, and publishes on Data Science and its societal impact. She blogs on these and other topics on mathbabe.org. (Observe that there is an interesting asymmetry: it is highly unlikely that anybody with a degree in Data Science will ever write anything important on algebraic number theory. But I digress.)

What O’Neil calls “Weapons of Math Destruction” (WMDs) are statistical algorithms whose use, under the given concrete conditions and circumstances, has – at least potentially– a harmful, grossly unjust, and sometimes devastating influence on individuals or groups whose data are processed, and who are subject to the decisions taken on the basis of these algorithms. O’Neil has gathered an impressive amount of chilling examples of such WMDs, from police and schools via applicant selection for universities, jobs, loans, and insurances, to advertising, investment banking, and politics. The books makes it abundantly clear that in every sphere of our lives, we have to face the fact that Big Data algorithms are carriers of increasing power, and its abuse, even when it all started with good intentions.

To give just one example, there is a chapter on the possibilities of influencing elections by targeted advertisements based on data gathered on Social Media. When I read it a year ago, it seemed to me a

rather far-fetched speculation on future possibilities, differing in this respect from the rest of the book. Meanwhile, we all know that Cambridge Analytica has brought these possibilities into reality already, in a way stunningly in line with the book's predictions.

The greatest strength of the book, however, is that it does not stop at collecting examples of WMDs, however interesting and relevant these may be. As a scientist, the author identifies the common features, properties and conditions that make an algorithm a WMD. Typically, she finds the following interrelated aspects. I will try to illustrate them by some examples from the book.

“ With the great power of Big Data algorithms, there comes great responsibility ”

» Intransparency: the precise way in which a WMD algorithm works, which data is used, and how it is processed is unknown to the subjects, the public at large, and often even to those who use it for their decisions. This makes a rational debate impossible, as in the case of the school administration in Washington DC, which had all available data on their teachers aggregated in a single score, and then fired 206 of them, based singly on that score, which obviously did not account for any particular aspects of individual situations.

» Creating its own reality and, consequently, self-perpetuation: police departments rely on algorithms to predict areas of heightened criminal activities, and

concentrate their surveillance in these areas. The predictions thereby become self-fulfilling prophecies, as more crime is detected there. Consider now two equally active criminals, for example small-scale drug dealers or users, one in a “good” and the other in a “bad” neighborhood. Their chances to be caught will be increasingly different. In effect, this amounts to social and racial bias in policing, even without any prior intent to do this.

» Enhancing differences between people in advantageous and disadvantageous positions: when an algorithm decides you are at heightened risk of not being able to pay back a loan, the bank running this algorithm will refuse the loan, or demand a higher interest rate and better securities. Needless to say that this will further complicate your financial situation. By the way, the decision might have been based on faulty or obsolete data, but in general you will hardly be able to know.

» Lack of checks, balances, and countervailing power: chances for a Big Data algorithm to behave as a WMD are particularly high in a situation where a power disbalance exists between the surveyor and the surveyed. There, the use of the algorithm tends to enhance the disbalance. This is shown for relations between employers and their employees, healthcare insurers and providers and their patients, and others.

The examples given in the book are from the US, however, it would be naive to expect Europe to be immune to the dangers that they vividly illustrate. If there is any remedy, it has to begin with awareness of the problem. With the great power of Big Data algorithms, there comes great responsibility. If we ignore this, we do this ultimately at our own peril.



*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.*

Rens van H while walking in Groningen: "Hebben ze hier dan ook R.U.G.zakken?"

Arend: "Wacht hoe veel heb ik zojuist betaald?"

Maureen: "Tien euro!"

Arend: "Waaaattt?!!!"

Niels, pratend over zijn broertje: "Maar, ik heb ook nog een kind ... Euhm, broertje..."

** even later **

Niels: "Jongens, serieus, ik heb geen kind, hè."

Tom V: "Wit is toch altijd beter!"

Twan: "Heeft dat echt niks te maken met wat zei ik nou net?"

Vinz B: "Oh, mag ik komen?"

Mark R: "Ik heb 9 van de 11 geraden, daar zal Bush blij mee zijn."

Kees: "Nelly Furtado is toch een man?"

Kees terwijl hij iets omschrijft: "Het is huidskleurvormig."

Niekie: "Huh?! Heb je twee Pinksterdagen??"

Sanne: "Doe maar in je mondje."

Wietske: "Maar hij is zo lang."

Henk Jan: "Ik zou mijn oma ook doen."

** Aan het einde van de Geschwisterborrel **

Zus van Ralph tegen Rob de H: "Dus eigenlijk heb je helemaal geen autoriteit."

Rob: "Ik haal mijn overwicht uit mijn overgewicht."

Vinz B: "Als iemand tijdens de seks champignon vet over mij heen zou smeren, kan je me oprapen."

Rene van Hassel na een kwartier in het Nederlands college geven: "Oh is er trouwens iemand die mij niet kan verstaan?"

Arend: "Dat is alsof je glasscherven in je armen steekt, zodat als je naar de dokter gaat je er iets aan hebt!"

Maureen: "Wat nou, bro's before hoe's? Snacks before sex!"

Poes: "Ik heb ook een blauwe plek. *Drukt erop* au die doet pijn."

Ava: "Ik denk dat TRAIN wel rijdt, zeker als je er wat kolen ingooit."

Semi is bezig met de vijfde ronde sushi bij Jakatiro: "Ik wil niet zeggen dat ik honger heb, maar ik lust nog wel wat."

Laura K met een fotocamera in haar hand: "Hoe doe ik een cameraswitch? Ik wil een selfie maken!"

Nicky over thee: "Het smaakt naar hoestsiroop, maar dan toch niet."

Rudi Pendavingh: "Een hamer denkt ook dat alles een spijker is."

Laura K: "Je moet wel echt wilder zijn, anders piept hij niet."

Rick: "Wist je dat het dak van de markthal een rijksmonument is?"

Jealy: "Waarom? Omdat het vet oud en lelijk is enzo?"

Ian: "Ik ben een kuikentje en een breezer ananas!"

Roxanne: "Dit is een stoel waar je lekker op kan wippen"

Bram W: "Die paal was ook wel ongeveer mijn hele WISO-experience"

David T: "Maar ik heb het gevoel dat we iets over het hoofd zien hier, een rechthoek kan ook negatieve lengte hebben ofzo."

Chantal: "De blauwe druif is groen vanbinnen."

Lars G tegen Luuk G: "Nee je bent niet heet, je bent gewoon kamertemperatuur."

Ysabelle: "Steken? Ja. Slaan? Nee."

Remco: "Ian, ben links- of rechtshandig?"

Ian: "Weet ik niet."

Flep: "Als je geen piemel hebt, dan wordt je automatisch in het prestatieteam gemikt."

Jealy: "Chiel, heb je nu weer een huwelijk verneukt?"

Laura K: "Semi, niet meer aan de bel trekken! Je moet ook nog een keer een armbandje of iets leuks voor Niekie kopen!"

Arend over insecten: "Toen was dat mannetje zo van, ik wil seks! Maar het vrouwtje dacht, ik ben aan het eten dus doe!"

Marc van M: "BCF is de MacDonaldis van de ICT."

Sjaars Rick over GELIMBO: "Wij hebben wel veel seks, alleen met mensen van hetzelfde geslacht."

Sjoerd: "Moet ik je naar huis brengen?"

Bouke: "Ik heb thuis geen emmer..."

Bart tijdens 30 seconds: "Computers waarop waarop Windows draait"

Bas: "Macintosh! Apple! Linux!"

Tobin: "Ja maar wij zijn wel capabel."

Kees: "Ik ga misschien wel een leaseauto kopen."

** Er is drinken over van de Bata **

Ingmar: "Oeh! Energy!"

Wesley: "Zo blijf je dik!"

Ook Wesley: "... mag ik er ook een?"

Op de vrijmibo:

Lydia: "Ik hoop dat ik de trein haal hoor.... we gaan vanavond nog naar Paul!"

Wesley: "Maar we gaat toch zondag pas?"

Lydia: "tja..."

Een jongetje van ongeveer 8 jaar oud wijst naar een lantaarnpaal in de Efteling en zegt tegen zijn vader:
"Wat de fucking reetkever is dat?"

Merel P: "Ik zou echt een hele slechte vice-voorzitter zijn!"

“ Wat nou, bros before hos? Snacks before sex! ”

Ian: "Welke is goeie? Heineken?"

Wesley: "Druiven zijn toch gemaakt van wijn?"

Lars: "Ik wou dat ik jouw groep had."

Amber: "Je mag mij wel hebben."

Lars: "NICE"

Jort de B: "Ik heb het vorige week met iemand over berenlulletjes gehad echt heel de avond."

Twan: "Eerst heb ik een vrouw, daarna een man."

Luuk M: "Mechanische toetsenborden? Typmachines!"

Niels: "Kijken jullie nooit naar AstroTV?"

Ruben: "Als Ralph een punt maakt zit hij er altijd met zijn neus bovenop."





MEMBER

TU/EXIT

“ *D* read it. Run from it. Destiny still arrives.” In the summer of 2017, it was time for me to meet my destiny: my days as a student were over. Having finished my dissertation, the student life had to make way in order for me to embrace my new lifestyle and become a ‘burger’. Where most people stick around and try to settle for a job close to where they live or used to live, I decided to move to a country that is about to cut (most of) its ties with Europe, where they can’t tap a beer with a proper beer head and where no one seems to be able to properly pronounce my name. What was I thinking?!

TEXT Bas Lodewijks

‘Twas about half a year earlier that I got the opportunity to apply for a postgraduate position at the university of Bath. I felt that I wasn’t really done learning about mathematics yet, so it was a great timing. I still enjoyed mathematics and there clearly was so much I didn’t know yet, even after almost finishing my Master of Science. And, not unimportantly, it would allow me to avoid my destiny for a little longer, as staying at a university would allow me to prolong the student life, or so I hoped.

I guess you have a feeling what happened next: I applied, got the job and four days after I finished my dissertation I flew to the UK, on to the next adventure. It meant I had to leave a lot behind, but when one door closes, another opens.

Arriving in Bath, I needed some time to adjust to the new English lifestyle. As a proud Dutchman, I was of course going to need a bicycle. How else can one get from one place to another? I arrogantly thought cycling to the university, situated on a 180 meter high hill, would be easy. Well, think again. I still do it though, it’s far better than those terrible university busses, but it takes quite some effort.

The city itself is truly wonderful. It’s the only city in the world which is listed completely as a UNESCO heritage site, famous for its Roman baths and the beautiful Roman and Georgian architecture. Not a day

goes by where I don’t discover something new that’s interesting or beautiful. It’s a true sight to behold.

“ ... I’m not a ‘burger’ at all, just a student who gets paid! ”

In my day to day life as a postgraduate student I work on problems within random graph theory, assisting lecturers in teaching undergraduates, attending seminars and going to conferences every now and then. Doing research requires a proactive attitude and quite some independence, but it’s very rewarding, exceptionally interesting and I’m learning a lot.

Since the university still views me as a student, even though I do a PhD, I can easily participate in music societies and, of course, the wine society. Together with the freedom I have to choose my own hours, I’ve concluded I’m not a ‘burger’ at all, just a student who gets paid!

It’s already been a great ride so far, and I’m definitely looking forward to what’s in store for me for the next three years. And if you ever happen to be in the neighbourhood, make sure to knock on my door, and then I’ll treat you to a Bath Ale.



BETALEN MET IDEAL

SUGABABES, SAMENWERKING EN KOFFIE MET SUIKER

Een deel van de lezers zal de vraag “of je docent wil worden” wel eens krijgen. Ook ik heb die vraag meermaals gekregen. Er is hoop. Met een wiskunde diploma op zak ben ik naar de Carrièrebeurs gegaan om te zien of er nog een ander carrièrepad voor mij in het verschiet lag. Daar heb ik toen een leuke ervaring gehad met de mensen van DSW (zorgverzekeraar) en daar ben ik sinds augustus 2017 in dienst gekomen als software developer. Na een intern opleidingstraject en wat vliegrepen bij het opleidingsteam, ben ik sinds begin dit jaar betrokken bij het ontwikkelen van de MijnDSW-app.

TEXT Colin Groot - DSW

Vroeger was het betalen van een factuur vanuit de DSW-app nog relatief omslachtig: alhoewel alle benodigde gegevens uit de factuur gekopieerd konden worden, moest je nog steeds zelf een overboeking naar DSW doen. Nu kun je gelijk met iDEAL je factuur afrekenen.

In de app wil je features inbouwen die wenselijk zijn voor de klant. Wanneer je de feedback van onze klanten erbij pakt, stond betalen met iDEAL hoog op het lijstje. Dan is de keuze gauw gemaakt. Laat ik jullie meenemen naar de periode waarop wij deze feature gingen opleveren.

“ Push the Button ”

Het bouwen van software gaat gepaard met het consumeren van warme versnaperingen en, in mijn geval, een schandalige browserhistorie van popsongs uit de tijd dat de Sugababes nog een bekende meidengroep was. Specifieker, het inbouwen van iDEAL-betalingen valt uiteen in meerdere stappen: allereerst haal je bij iDEAL de lijst van banken op en toon je deze lijst op een pagina. Wanneer een gebruiker op een bank klikt, wordt de benodigde betaalinformatie aan iDEAL geleverd en ontvangen wij een link die de gebruiker bezoekt om de betaling te kunnen doen. Na

het doen van de betaling keren de klanten terug in de app en verwerken wij de betaling.

Met het team van app ontwikkelaars hebben wij deze stappen gesplitst per platform (we bouwen apps voor Android- en iOS-toestellen) en door iedereen wordt aan een specifieke taak gewerkt. Bij overlappende delen onderbreek je (alweer in mijn geval) soms “Push the Button”, de hitsingle van de Sugababes uit 2005, en bespreek je met een andere ontwikkelaar hoe je de overlap zo vlekkeloos mogelijk op kunt lossen. Laat ik niet vergeten het team te bedanken dat iDEAL-betalingen mogelijk heeft gemaakt op de website: hun werkzaamheden hebben ons enorm geholpen.

Uiteindelijk wordt de feature uitvoerig getest om te zien of er geen mankementen aan het licht komen. Wanneer alles in orde is, worden de nieuwe versies van de app in de Google Play Store of de App Store geplaatst en houden we bij met Google Analytics of de nieuwe feature een zinvolle toevoeging blijkt.

Uit de statistieken en de feedback van de klanten van de klanten is gebleken dat de iDEAL-feature een zeer nuttige toevoeging is. Dat geeft zowel de app-ontwikkelaars als de klanten een goed gevoel.

Tijd voor een bakkie!



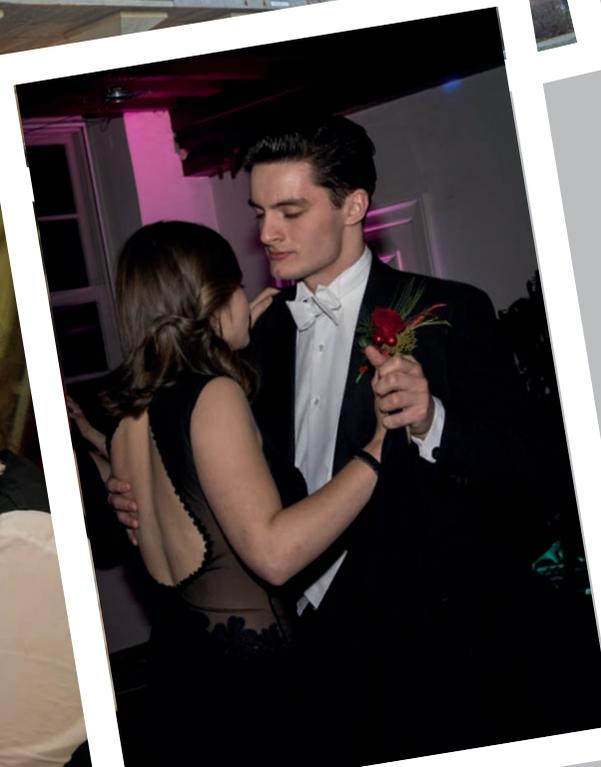
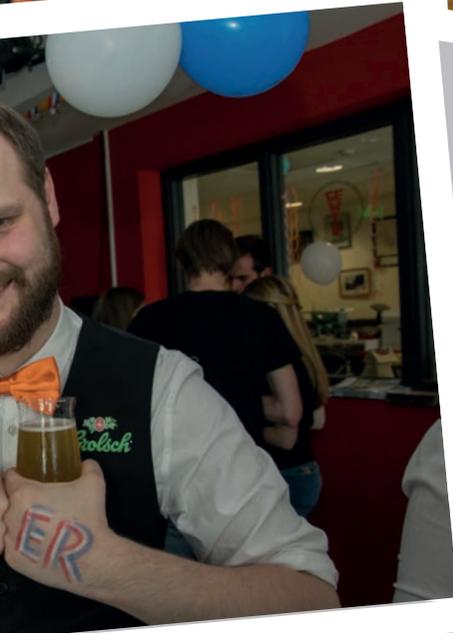
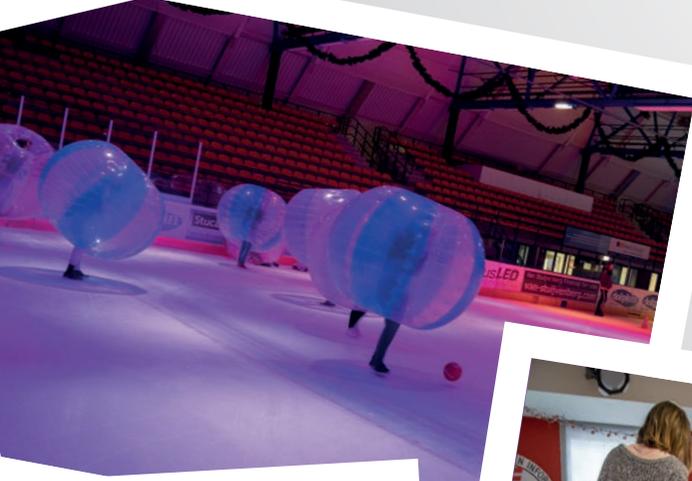




FLASH! FLASH!

Where are those coming from? If you see flashes from the corner of your eyes, there is a good chance it might be us. And in this year of celebration, we as GEFLITST are ready to take a lot of lovely photos! We hope you enjoy them on www.gewis.nl/fotos!

Here's a festive sample of pictures! Enjoy!





MEMBER

TWO ASSOCIATIONS

I joined GEWIS and Cosmos for largely the same reasons – it was easy. I joined Cosmos on my first day of the intro week, back when international students had a whole week of introduction run by Cosmos. I joined GEWIS that same week, when Cosmos brought us to visit our respective study associations. Both associations had a very easy signup process, and I didn't really see any downsides to signing up for either; GEWIS's sign-up fee would pay itself back in the book prices for quartile one, and Cosmos was just free. At the time, I didn't really understand how much of Eindhoven student life was based around associations, and I wasn't really sure if I would be active in either. So I figured I'd join both for now and figure it out later.

TEXT Eetu Närhi

From there on, I mainly hung out with friends outside of any association. However, many of them happened to be existing Cosmos members, and I slowly became more and more active. Being around others in the same situation as myself, i.e. living in a foreign country, was comforting at first, but I hadn't left Finland so I could avoid the unfamiliar altogether. It turns out, Cosmos was not only initially my soft landing to the Netherlands, but soon became my portal to the new and unusual world of Dutch student life.

“ Nevertheless, I was still happy to get to share some of my culture with my existing friends ... ”

Ironically, I found out about the concept of “borrels” not through GEWIS, but through Cosmos. In Finland, bars on campus weren't unheard of, but they were almost exclusively illegal. So hearing from some of the Dutch Cosmos members that there are 13 *legal* bars on campus was fairly shocking, but I was no stranger to getting drunk at 4pm, so I jumped right into the deep end.

Soon enough, after having experienced Sinterklaas and Carnival, I founded (with the help of my then-future Chairperson Jackie) a new committee at Cosmos: the Language Cafe Committee. The idea was to visit a different study association bar each month, and speak different languages with people over some drinks. Naturally, the first bar I contacted was GEWIS, and the first edition of the Cosmos Language Cafe feat. GEWIS was a success.

A few weeks later, just after I got elected to the board of Cosmos, we organized another event with GEWIS: a traditional Nordic midsummer celebration. Being from the Nordics myself, I can tell you the term “traditional” honestly wasn't entirely accurate. It was held too early, a few weeks before the solstice, the event was over before sundown, and worst of all: we didn't even burn anything. Nevertheless, I was still happy to get to share some of my culture with my existing friends, and some new Dutch friends whose culture I had been busy taking in for the past nine months.

I've come to realise that the reason I became more active at Cosmos is not because I shared a bunch of interests with Cosmos members, but precisely because I didn't. What connects Cosmos isn't a shared interest between members, it's the desire to experience new, unfamiliar, and dare I say, *mysterious* things.



TRAINING-ON-PAPER: EFFECTIVE MEETINGS

Have you ever noticed how the best-looking rooms in the Netherlands are meeting rooms? The Netherlands have always been a fairly egalitarian society, where things are not necessarily imposed from above but rather discussed. The phenomenon of 'having meetings' has pretty much been invented here. One might even say that when you never have meetings, something must be wrong with you.

TEXT Merel Pennekamp - TRAIN

Still, having lots of meetings does not make us experts on the matter. Especially with the shortening of the lunch breaks in the next academic year, we need to organize our meetings more effectively. To guide you towards a better use of your time, TRAIN provides you with some helpful tips for having more effective meetings.

1. GOAL OF THE MEETING

It is easy to slip into routines. Having a meeting every week, 2 weeks or every month... Sometimes we have meetings just for the sake of having meetings. Before even scheduling a meeting, it is important to ask yourself "Why are we coming together?", "What will be discussed?", "Why now?". One thing to do is to establish what kind of meeting you are going to have:

BRAINSTORM MEETING

The goal of a brainstorm meeting is to make a list of possibilities. To make this meeting go as smooth as possible, it is essential that all attendees have thought of ideas themselves before the start of the meeting.

INFORMATIVE MEETING

The goal of an informative meeting is to bring all attendees up-to-date about certain topics and attendees can ask questions. It is important that the people who are expected to give these updates are informed well ahead that they will be asked to do so.

BRIEFING

The goal of a briefing is to instruct and inform all attendees, usually shortly before an event will take place. All attendees are aware of the event and no new topics will be introduced.

DECISION-MAKING MEETING

The goal of a decision-making meeting is to have made one or more decisions by the end of the meeting. For a more effective meeting, all attendees should be informed well ahead that a decision will be made during the meeting, and they should receive the necessary documents so they are informed about the matter and background.

When the goal of the meeting is made clear well ahead to all attendees, everyone will be better prepared for the meeting.

2. PREPARATION IS KEY

After establishing and communicating the goal of the meeting, all attendees can now start preparing themselves for the meeting.

LOGISTICS

Logistics should be arranged by the chairman long before the meeting takes place. Location, time and necessities should be clear for all attendees at least one or more weeks before the meeting (this may vary per kind of meeting).

COMMITTEE



TRAIN TRAINING COMMITTEE

DOCUMENTS

It is crucial that all attendees receive the necessary documents in time so that they can prepare for the meeting. The chairman is responsible for sending out the documents days or weeks before the meeting (depending on the meeting). There should not be any new documents introduced during the meeting itself.

AGENDA POINTS

The attendees should receive the agenda as soon as possible (another task of the chairman). If there are missing agenda points, these should be requested before the meeting and not during. That way, all attendees can prepare the new agenda point beforehand.

BE ON TIME

If people are late, do not wait for them before starting the meeting. After all, the time and location have been communicated well ahead. When they arrive, do not stop the meeting to give them an update about the current subject, this interrupts and unnecessarily prolongs the meeting: it's their fault that they were not present when the subject was introduced.

NO PHONES

It's very simple: phones cause distractions during meetings. All attendees should put away their phones until after the meeting.

FINAL INQUIRY

The final inquiry is a part of the meeting where all attendees get the final chance to make notice of

something or inform/ask others. This is also the part where the chairman should summarize what has been discussed during the meeting and inform or ask about agenda points for the next meeting.

Most of these points rely on the chairman. However, it is beneficial for everyone if the meeting is as effective as possible. Therefore, it is encouraged to be proactive. For example, if you are missing the documents needed to prepare yourself for the meeting, ask the chairman when these documents will be sent out. Or when your neighbor is checking their phone every five minutes, ask them to stop this distracting behavior. After all, you are all in the same meeting room together.

3. THE CHAIRMAN

Everyone in the meeting can contribute to having a more effective meeting. However, one person plays the most important role in this: the chairman. He or she is in charge of the meeting. Not only is the chairman responsible for arranging and communicating the logistics and documents in time, the chairman is also responsible for the course of the meeting. For one, he or she should cut off people who talk too much and give the word to the quieter attendees, so that everyone gets their say without pushing their own agenda. Here are some other guidelines that might help the chairman guide the meeting as fluently as possible.

ACTION POINTS

The chairman should know whether action points have been fulfilled or not before the start of the meeting. That way, incomplete action points can be discussed without it turning into public shaming. The

chairman could also remind others of their action points, to make sure that all action points get done in time. This contributes to a quicker process in general.

Tip: Before sending out the agenda, note behind each agenda point who will be introducing the point and how much time will be spent on it.

SCHEDULING

Meetings are most effective if a schedule is made and kept to. The chairman should have an overview of how much time will be spent on each agenda point and who will be introducing the point. It might also help to note this on the agenda, for all attendees to see.

THE HAMMER

Oftentimes, the chairman does not have a hammer during (small) meetings. And when they do, it is sometimes wrongfully used to maintain order. The hammer of the chairman should be used for three things only:

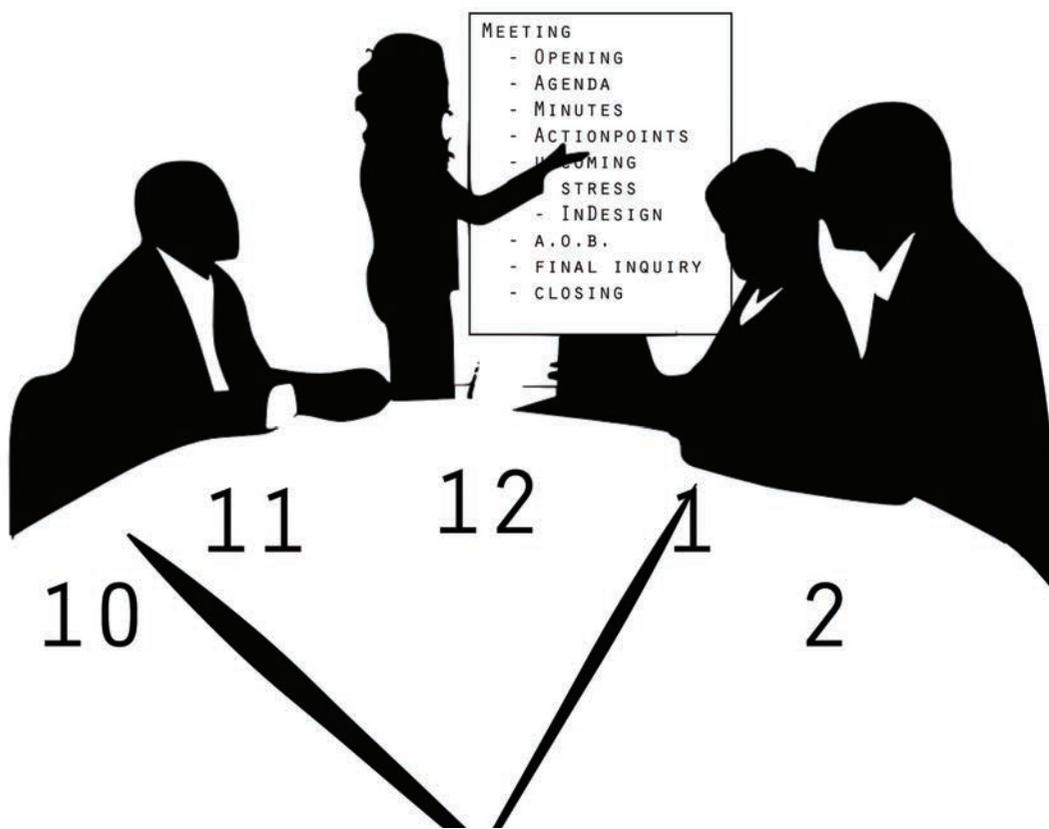
1. The opening of the meeting.
2. Approving or disapproving proposals / making decisions.
3. The closing of the meeting.

The power of the hammer lies in the closure of a point. When the hammer has struck, whether a decision is made or a proposal is disapproved, the subject is finished. It informs all attendees that the subject will no longer be discussed and to proceed to the next point.

VOTING

For some decision-making it is required that all attendees vote for the record. But taking a vote could also be used to resolve or analyze a discussion where two or more attendees seem to disagree with each other. This vote can be binding if the chairman so decides, but it does not have to be. It will surprise you how often people can have a fierce discussion about something they actually both agree on. A simple, informal voting can easily resolve misunderstandings, after which the meeting can proceed to the next point.

To conclude, having effective meetings is a group effort. Within a committee, jokes can make meetings more fun and not all tips and tricks might work out for every meeting. However, you are very likely to have more meetings in the future. With these tips in mind, you are guaranteed to spend less time in meeting rooms, and more time doing the things you love.





Do you have a question for SupreMUM as well? Leave your question in the SupreMUM box in the GEWIS room or send it to supremum@gewis.nl and you may get an answer in the next edition!

Klopt de Riemann Hypothese?

Boven de Riemann Hypothese gaan maar weinig problemen. Die Riemann Hypothese (ook wel bekend als Hilbert's achtste probleem) is een van de millenium prijsproblemen; als je dit kan bewijzen win je een prijs van 1 miljoen dollar.

Gelukkig heeft SupreMUM wiskunde gestudeerd, en natuurlijk heb ik speciaal voor jou een bewijs opgesteld.

Er bestaat een functie f waarvoor geldt dat

$$\zeta(s) = \frac{1}{1-2^{1-f(s)}} \sum_n \frac{(-1)^{n-1}}{n^s} = 0$$

Hierdoor hoeven wij alleen nog maar te kijken naar deze f functie en zijn eigenschappen.

Wij stellen als ansatz dat deze functie te schrijven is

$$f(s) = \frac{g(s) \cdot h(s)}{u(s)}$$

Hierbij valt op te merken dat $\{g(s), h(s), u(s)\}$ een grobner basis vormt. Helaas betekend dat er maar een beperkt aantal functies zijn die aan de definitie van f voldoen.

Is het dan toch mogelijk om deze functie met behulp van een limiet te berekenen? Voordat ik hiervan het antwoord wil verklappen wil ik eerst nog even de 3 uur 's nachts definitie van het limiet herhalen.

Een functie heeft een limiet L in het punt p als

$$\forall \epsilon > 0 \exists \delta > 0 \forall s :$$

$$0 < |s - p| < \delta \Rightarrow |f(s) - L| < \epsilon$$

Ja, het is duidelijk dat het zeker mogelijk is om het limiet hiervan te berekenen, namelijk, met behulp van de stelling van Fermat. Volgens deze stelling is het niet mogelijk om een oplossing in de natuurlijke getallen te vinden voor de vergelijking

$$x^n + y^n = z^n$$

Slechts weinigen kunnen het incomplete bewijs hierboven begrijpen, en waarderen.

De rest van het bewijs zal alles wat hierboven staat verder verduidelijken. Na het lezen van het volledige bewijs zal iedereen het er mee eens zijn dat de Riemann Hypothese voortaan "De stelling van SupreMUM" genoemd zal moeten worden.

De rest van het bewijs is spectaculair, maar helaas is deze pagina te klein om de rest hiervan te bevatten...

Is mayonnaise an instrument?

According to Wikipedia, an instrument is an object that contains a construction with the purpose of creating tones. But if we look at the construction of mayonnaise, if you slap it with a spoon or an spatula, it will produce a sound. However, this frequency is rather high for an instrument (somewhere within the 1000 to 2000 Hz scale). But drum heads also produce sounds like this when they are hit with a drumstick. So Patrick: Yes! Mayonnaise is definitely an instrument.

PUZZLE OPTIVER

Over thirty years ago, Optiver started business as a single trader on the floor of Amsterdam's European Options Exchange. Today, we are a leading global electronic market maker, focused on pricing, execution and risk management. We provide liquidity to financial markets using our own capital, at our own risk, trading a wide range of products: from listed derivatives, cash equities, ETFs and bonds to foreign exchange.

What really sets Optiver apart from other companies is its openness, honesty and our colleagues. People have very strong opinions, but they are also open to listen and to change their mind if the facts presented by others have more value. The team shares the same goal, meaning that we are all pulling in the same direction and you as an individual care about how the person next to you is doing their job. Most importantly, we like to solve puzzles!

Are you the same? We challenge you to send us the solution to the puzzle below to Dana Craciun, Recruiter at Optiver. (danacraciun@optiver.com)

Calvin has to cross several signals when he walks from his home to school. Each of these signals operates independently. They alternate every 80 seconds between green light and red light. At each signal, there is a counter display that tells him how long it will be before the current signal light changes. Calvin has a magic wand which lets him turn a signal from red to green instantaneously. However, this wand comes with limited battery life, so he can use it only for a specified number of times.



A.

If the total number of signals is 2 and Calvin can use his magic wand only once, then what is the expected waiting time at the signals when Calvin optimally walks from his home to school?

B.

What if the number of signals is 3 and Calvin can use his magic wand only once?

C.

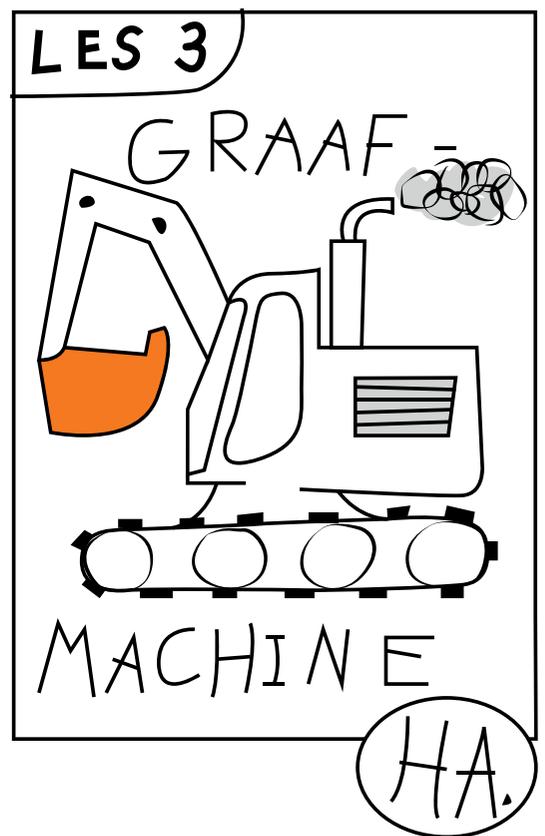
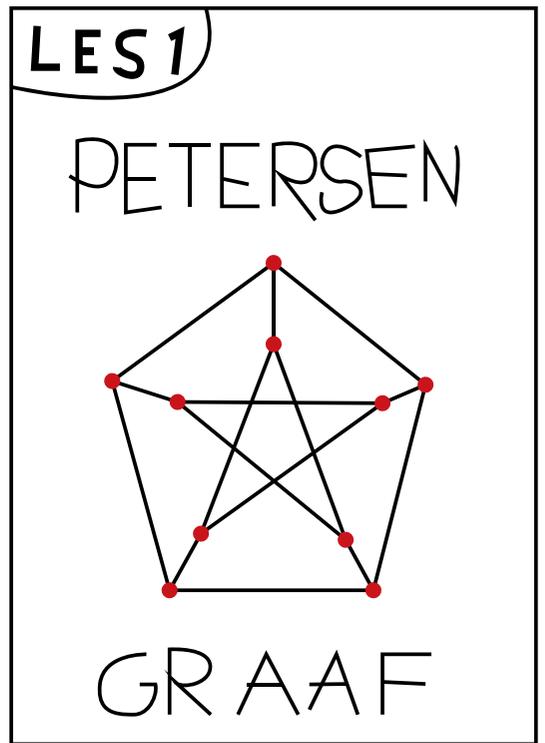
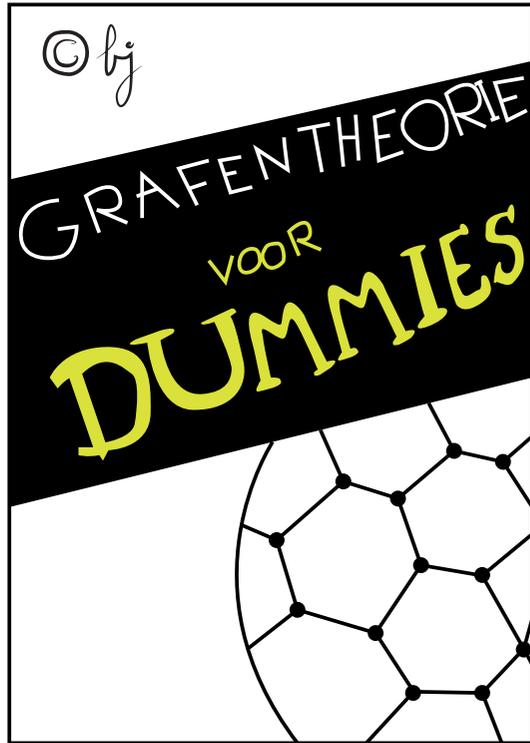
Can you write a code that takes as inputs the number of signals and the number of times Calvin can use his magic wand, and outputs the expected waiting time?

PRIZE

If you are one of the first ten people to submit your puzzle solution, you will be in the running for a great prize – an Optiver backpack with an integrated Bluetooth speaker.

ADVERTORIAL







BOARD 37

MYSTERY OF THE CANDIDATES

Going to do a board year with six other members is like going into a relationship with six people you don't really know. You are spending a lot of time with them and will get to know all each other's characteristics. Sharing some of our secrets would be a good step in this process, therefore every candidate wrote a small, somewhat embarrassing story about themselves. To keep the mystery alive, we will not tell you which story belongs to which candidate. To solve these mysteries, you can talk to the people in pajamas at GEWIS.

TEXT Board 37

1. SPIN THOSE RECORDS

I have been spinning records since I was fifteen. I set the mood at graduation parties, techno parties, wedding anniversaries and even a national ice skating competition. I started doing this with a friend from my hometown and we were performing once a month, just for fun. It was my experience that the parties of which you didn't expect they would escalate, turned out to be the craziest ones. An example of this claim is a party with only forty-to-fifty-year-old people. This party started easy and mellow, so to raise the mood, I used a song from when the party people were young: You Can Leave Your Hat On by Joe Cocker. This turned out to be a hit, to my own surprise around ten men and even a woman started taking off their clothes. One man got pushed into a chair and the others started doing dance moves I didn't know and didn't even want to know. At the moment I am still making mash-ups from popular dance tracks and I am always singing along only a little too loud.

2. DRIVEN AROUND

The title of this story suggests I am a VIP, driven around in a limo or such. But it is the other way around. Namely, I was used by my sister as a doll and was driven around in a buggy. My sister didn't like the fact that the dolls didn't talk back to her or didn't even move at all. Therefore, she needed me, so she used me as a toy. Lucky for me, it was my sister and not a big

brother who loved soccer. Now I am still able to talk and move around, only now I am fully grown up and make decisions on my own and my sister doesn't drive me around anymore. The fact is that I am a bit like my sister, I also like to play with people, not like she did, but in the sense of competing or collaborating with them.

3. EUROPEAN STAR

I think a lot of you know me, I am that very enthusiastic person jumping around GEWIS, but I could also have been known around GEWIS for other reasons. I could be known from, wait for it, the Junior Eurovision Song Contest. At elementary school in music class, I had to write a song with some of my classmates. One of the parents had some experience in the music business and said that we should send in our song to the national selection for Junior Eurovision. To my big surprise we made it to the final thirty of our country. Unfortunately, I didn't make it to the European final, otherwise there would have been a small chance that I did become a European star. On the other hand, I am lucky I didn't get famous and could instead become a candidate of the 37th board of our amazing association.



4. PENGUINS OF THE REFRIGERATOR

Everyone was lied to by their parents about some stuff, the most common example is Santa Claus. This story is about such lies and the consequences these lies could have. When I was a kid my father wanted me to close the door of the refrigerator every time when I used it. Obviously, I didn't do this, because it is not fun to have to listen your parents. But my father thought of something to make sure I did close the door. He came up with the lie that there were penguins living in the refrigerator and keeping the door open would result in the penguins leaving the refrigerator because it got too hot. My father forgot that I love animals, so I wanted to see the penguins. Therefore, I opened the refrigerator, grabbed a chair and stayed until the penguins came out. Obviously, this didn't happen and before my parents got home, the refrigerator wasn't refrigerating anymore and all food was defrosted, and so could be thrown away.

5. FIRST SIP OF ALCOHOL

I believe I was about eight years old. Together with my family, we were celebrating my birthday on camping "Ter Spiegel" in Eersel. Since I was turning only eight years old, one of the five camping mascots came to visit our tent to congratulate me with my birthday. Of course, I was very happy to see him, he was like a celebrity to me at that age. When he left, my mother went to the fridge to take out a bottle of champagne. She noticed that I was looking at her, so she asked me whether I would like to taste some. Obviously, I said yes. I took a sip and I quite liked it. My mother went away for some minutes, whereafter she found her glass empty on the side of the table. I liked it a little too much, I guess. She even asked me if I would like some more. So I got another glass of champagne and again it was empty after some minutes had passed. The rest of the day, I was pretty jolly with my red cheeks.

6. CIRCLING AROUND THE ENTIRE TERRAIN

When I was young my hobbies were already decided for me: my mother was crazy about horses, so me and my brothers had to ride horses ourselves, and through the perseverance of my mother I got an embarrassing story to tell. When I was around twelve years old, I had a pony who was called Roelie, it was a very old and thus obedient one. I only liked the jumping part, so that is what I mostly did. At home, Roelie always jumped over every obstacle, but when she was in a competition, she didn't. So this one time, Roelie didn't feel like it, or it was just my incapability, Roelie refused to go over the obstacles. This was my cue to get mad at her and I started shouting at her. Meanwhile, I was making a big circle around all obstacles. Because of this iconic appearance, people are still referring to me as the kid who shouted at its horse, while driving around the entire terrain.

7. WELL-BEHAVED KANDI

You might all think that the candidate board can't do anything and is always fooling around, but there was a time when we were young and well-behaved too, as this story proves. When I was just a kid, my parents weren't afraid of losing me. While on a vacation, they put me on a blanket and they could leave for no matter how long. This was because I was afraid of leaving the blanket and touching the grass, it tickled my feet. My parents used this a lot on me, but after a while it stopped working, as grass isn't that scary. Now I am running on the grass every week behind a ball, trying to get it in the goal of the opponents.

WHO IS WHO?

Write down your guesses!

1

2

3

4

5

6

7





COLUMN

HOW RUSH BECAME COOL

*The world of music has always been a realm of the people. In the end, there's always someone who creates it and someone who will listen to it. The creators of music are often seen as representatives of the group that will listen to their work. Punk has Mohawk wearers, reggae has people who smoke, jazz had whiskey drinkers and funk has wide jeans folks. But where in this world are the geeks? Do we know them? Until 1974 we never got a clear glimpse of them, and even shortly after we still didn't see them. But it is in this period where we can find the answer to what Dave Grohl thought to be the biggest mystery in music ever: 'When the f*ck did Rush become cool?'*

TEXT Lars Verstraelen

Rush, of course! THE band for the rockers who like to play with Rubik's cubes. The band for the people that want to drink beer at a concert while wearing socks in sandals. The band with perhaps the greatest musicians of all time, that are being seen like this; the representation of the geeks. I must admit that the question from Dave Grohl is just, in the sense that it is quite a mystery. A band that made music that was not for the one who wanted to hear, but for the ones who wanted to analyze and deeply listen to music. How could such a band be the monolith in Prog Rock, the seller of 40 million records, and at the same time never been recognized or helped by mainstream press? Let's explore.

It is 1968 when in Toronto, Canada, a group of three guys by the names of Alex Lifeson, John Rutsey and Jeff Jones formed a band named Rush. Instead of smooth sailing, the band already experienced problems in the very beginning. Before even playing their second show, bassist and front man Jeff Jones left the band and was quickly replaced with Geddy Lee. This was however a problem in disguise; Geddy Lee's playstyle allowed the band to form a chemistry that would eventually let the band experience a 180. They changed from blues songs to rock. Eventually, enough songs

were written for their 1974 debut record: RUSH! An album which hit big time in Canada. They received some airplay, initially had good album sales and their song 'Working Man' is still seen as a hit. However, immediately after the release of RUSH, Rutsey had to leave the band due to issues with his diabetes. Rush searched for a new drummer, and this journey would end at the discovery of Neil Peart. The guy who literally turned the page for Rush.

“ The band went against all rules and stayed on its course ”

Neil Peart had a painful childhood. This mainly included a lot of bullying, and being put away as an outcast. He would use drumming as his sanctuary. You could see this as the beating and slamming that he always wanted to do. Joining Rush would eventually do him more good than drumming alone. His style allowed Rush to now also start playing way more intricate. The style of Rush was not easily seen as rock anymore. Peart's jazz inspired drumming paved the way for rock music with unexpected measure changes,



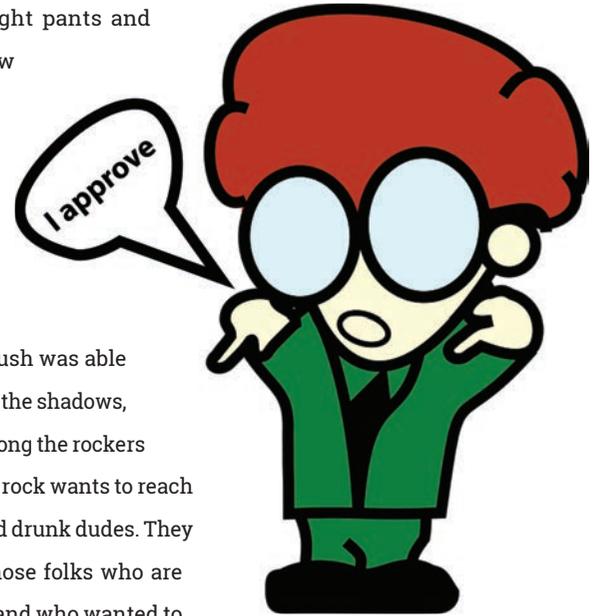
rhythm tricks, melody and key changes and lyrics that meant something: progressive rock. However, the world was not ready for their music. Airplay of their music went down, shows were becoming scarce and their popularity decreased intensively after the release of *Caress Of Steel* in 1975. The record label started pointing its finger towards Rush with the devilish command: 'Thou shalleth maketh some commercially successful music or we will banneth thou.' Rush had other ideas. They took the biggest risk of their career: 2112.

No record had ever carried so much risk with it. This record contained way more intricate music, way more complexity, and far beyond way more spacey and geeky lyrics about mythological futuristic societies, for instance. So, in short, the band went against all rules and stayed on its course. Peart had a huge role



in this record: both lyrics and musical patterns were constructed by him. This was all inspired by his youth. The kids that would harass his life by waylaying him after school, so they could kick him for his weird thoughts, were not around at the time. Rush wrote, with Peart's heavy influence, the most complex piece of that time. Songs with astronomical impact like the 20+ minute long '2112', the shorter song 'A Passage To Bangkok' and 'The Twilight Zone' were featured on this record. And for some reason the record exploded into the music scene. No musician in rock had ever heard that you could take rock music, and use techniques like you would hear in jazz on top of that. It was different, it was inspiring, and it featured a

picture of the band in skin tight pants and Japanese kimonos; I mean how cool is that!? But really though: how cool is that? Because Rock is regarded as the music for the wild people; the ones who in their life mainly enjoy sex, booze and drugs. By creating this music, Rush was able to pull the geek community out of the shadows, right into the light. They lived among the rockers now. They showed the world that rock wants to reach more people than just long-haired drunk dudes. They showed that you could reach those folks who are outcasts, who are being bullied, and who wanted to be part of the world as a whole. The platform of rock now also was being wandered through by nerds; those who wanted to belong somewhere.



Lyrical speaking, Peart's main concern lies with these people. He has been someone who has always been put away. He even has the courage to describe what it feels like to be an outcast in Rush songs. After 2112, many more records followed that were also records in rock music. Among these records were albums like 'Signals' and 'Power Windows'. These albums contain songs like 'Subdivisions', 'Grand Designs' and 'Mystic Rhythms'. These songs carry lyrics that describe Neil Peart's vision of those who you could see as the popular guys picking on the nerds and outcasts. In his vision he describes that it does not allow these people to fully be functional, that they will always live in 'Subdivisions' with their 'Grand Designs' only in their head while listening to their own 'Mystic Rhythms'.

Rush did what maybe some of us wanted in their lives when we were little: they made bullied people/ discarded people/'just plain nerds' belong somewhere with others. So, consider the mystery around the 'coolness' of Rush solved. I, as a nerd myself, want to thank them for the inspiration that I get for writing my own music, and for writing about the stuff that lives in my head.



WORKING IN HER MAJESTIES FINE COUNTRY

*A*fter (finally) graduating in Industrial Applied Mathematics, I had to go and find a job, as many of us do. But I knew I wasn't ready yet to fully let go of the student life that I enjoyed so much during the past years at GEWIS. I also figured out that I wanted to do research, which led me to the conclusion that it was time to start looking for a PhD.

TEXT Kit Smeets

After a couple of applications, I got the great news that I was accepted for a free research topic position at University College London (UCL), as long as it had something to do with cryptocurrencies. I decided to incorporate some more buzzwords, since my primary field of interest is post-quantum cryptography, and ended up with the topic "Post-quantum security of cryptocurrencies".

Thus, last October I packed my bags and moved to the UK for the coming 4 years (probably, a bit depending on Theresa May). The trip was quite simple, since there is a direct flight from Eindhoven to London. Finding a room was a whole other story, though. Since I did not start at the beginning of the term, most of the student dorms were full or did not allow me to bring my archery equipment. Normal rooms were super expensive or basically a shoebox. Finally I found a great room with a Dutch mom and her English husband in a beautiful Edwardian house in the west of London.

TUBE ERRORS

However, this means that I travel about an hour to and from work every day. This is a regular challenge, because the underground trains encounter more problems than the average NS train and more random, drunk people walk over/next to the track, causing delays. Thank god for having 4 different lines on more or less walking distance from my home!

When the subway does run, I meet a lot of interesting

people in it. There are all kinds of people in London, with different backgrounds and different ways of viewing life. The other day, I met a background dancer from a musical. He was practising his moves in the train, which looked so amazing! I love how people dare to be themselves here in the UK. An extra benefit is that the extra half hour on the subway gives me a good reason to read more books, because staring at people is just rude. I'm almost done with the Terry Pratchett Disc World series, so recommendations are welcome!

THE OFFICE

In my shared office (15 desks, 16 people) we always have a lot of fun, when we're not busy working. A nerf gun fight is a regular occurrence, with the occasional rubber ducky casualty. Even Elmo gets hit from time to time, although we all try to avoid him. From time to time we draw a target on the whiteboard with points in the different rings. We then shoot at it with sticky darts and hold a little competition on who's best at aiming. If we're not having nerf fights or competitions, we are playing table football in our common room, going out for a decent cup of coffee or walking to the market to get lunch. All in all, we are still very good at SOG'ing (I guess it's SEB'ing in English, Study Evading Behaviour).

The funny thing is that I was never really good at table football at GEWIS and almost never played (I belonged to the group playing cards, either Rikken or Spades). The first time I played, it was a glorious defeat (back

then, I could do exactly one trick and no defending whatsoever). In the 6 months I've been here, I learned a lot more tricks and I learned how to play defense. I'm still one of the worst players, but I'm slowly getting the hang of it. You might even be able to challenge me to a game when I'm back one day at GEWIS! (Although it's really likely that I'm playing cards.)

BREAKING THROUGH THE (LANGUAGE) BARRIER

The work and work ethics here are not very different from my time with Tanja Lange during my master thesis, although I do run into the occasional problem that I translate an idiom literally, because I don't realise it's an idiom, e.g. "cold frog country" (koude kikkerlandje). For the non-native speakers: Dutch has some idioms that are so common that they are not considered idioms anymore, but translating them is hard! Or I run into problems because I tell someone right in their face that they're doing something wrong (but in a nice way!), which is quite normal in the Netherlands. Apparently this is not so normal in the UK. Generally this is not a big problem though; everyone in the office is used to working with different cultures and opinions.

SPOT THE DIFFERENCES

One of the biggest differences between the Netherlands and the UK, is that no one cares whether or not I show up or what hours I'm working, as long as I don't miss meetings and do my work. This is partially due to the limited and expensive living space near the university (and thus the fact that everyone lives further away) and partially due to the limited space at the university itself. I usually work from 11:00-19:00, to avoid the rush hour in the morning and evening. Others start even later or barely show up.

REAL SEPARATION OF CHURCH AND STATE

Another difference (which tends to bite me in the ass) is that the free days here are differently organised, since England is not as Catholic as the Netherlands, but Anglican. This means that I don't have holidays on second day of Easter and Pentecost or Good Friday, which I'm used to. In fact, we are working on all Catholic holidays, except for Christmas. Even though

this seems to come at the advantage of having more vacation days to freely pick, I still need a bit more time to get used to this.

I also notice that London seems to be alive and awake for almost 24 hours a day. Even though Brabantian nights are long and at night after 2AM the rooftop comes down, this is nothing compared to nightlife in the UK. However, the number of young people that do excessive drinking is rather small. Of course we have our own version of Theta here, but other than that the student associations are rather against drinking (it has something to do with the number of alcoholics amongst their parents). This is a big contrast compared to nightlife in the Netherlands on student night!

One of the events where I regularly notice that drinking is a lot less common here, is the social drink that we have on Thursdays 5-7PM (Uncanny, right? Almost the same as "borrel"-time). This might also have to do with the fact that most supervisors are present too, and that half of them have plans in the evening that requires them to be sober.

LEGOLAND! BUT THEN IN WINDSOR

One of my favorite places, besides Bletchley Park and the National Museum of Computing, is Legoland! And now I basically live next to it! I can actually travel faster to Legoland Windsor than I can to work. I also figured that all of you have seen plenty of pictures of actual London, and therefore I added some of my Legoland pictures to this article. My favorite is the huge Lego Technic dinosaur <3.

All in all, living in the UK does not seem very different from the Netherlands. I mean, the money is different and weird, and now I'm constantly talking English instead of half the time, but it's still a West-European country and half of the veggies I'm eating actually are farmed in the Netherlands. The only thing I'm missing in terms of groceries is a decent kind of old cheese... But I'll just eat plenty of that when I'm back for a weekend! If you want to ask me questions, just talk to me on one of the many times I'm actually at a borrel at GEWIS, or find one of my GEWIS aliases to email to!



*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.*

Persoon: "Bij ons groeit er gewoon wiet in de tuin"

Iedereen: "Huh?"

Persoon: "Ja, ik kom uit Tilburg, hè?"

Over ketel en Stepah: "Het is de cursor, niet de wervingsdagen."

Luuk M: "Oh, toch ongeveer hetzelfde."

Huisgenootje: "De randstad is geen stad sukkel."

Teun van D: "Ja een dorp dan ook goed."

Een gesprek over de Bata:

Nicky: "Ja, ondertussen kan ik wel al een half uur hardlopen."

Laura: "Ja, ik kan ook wel een half uur lopen, maar niet echt hard!"

Rick komt voor het eerst Arends kamer binnen

Rick: "Wow, Arend, jouw kamer is echt oneindig veel keer opgeruimder dan jouw hoofd!"

Sjaars Rik: "Ik heb een sletterig konijnenpakje gekocht"

Vi: "Ooh die wilde ik ook kopen!"

Bor: "Alles kan kapot, ook de verbinding tussen 2 hersenhelften."

Nadym: "Dik is relatief."

Max: "Pas op he, Willem staat naast je."

Nadym: "Willem is dun! Relatief aan een vrachtwagen..."

Marijn tijdens een spel Iknow: "Welke Finse voetballer?"

Ian: "Arjen Robben!"

Bram: "Wat? Sinds wanneer is Robben Fins? Die is nog steeds Nederlands hoor!"

Ian: "Oh Fins? Ik verstond fit!"

Bram: "Wat? Sinds wanneer is Robben fit? Die is nog steeds geblesseerd hoor!"

Arend: "If I lived in Germany I would hate him! He is like the German version of Robert van Harlingen!"

Wout: "Suus, ik ben morgen een kwartier later!"

Suus: "Trut!"

Wesley: "Dat wist je toch al?"

Suus: "... Oh ja!"

Twan: "Dat ding past niet helemaal in mijn mond."

Mitchel B over Supremum 50.1: "Hij ziet er uit alsof die moe is"

Tijdens bierpong

Niekie: "We willen graag een driehoek!"

Thijs: "Willen jullie dat of doen jullie dat?"

Merel: "...dat willen we en dat gaan jullie dus doen."

Gijs: "Huh hoe kan je ooit met de trein vanaf jou naar de uni komen, er is toch helemaal geen station?"

Tobin: "Ja er is toch gewoon een station op strijps?"

Gijs: "Ja dat snap ik maar waar is dan een station hier bij de uni?! Oh shit wacht."

Sander S: "Dat zijn geen vissen, dat zijn koeien uit Tsjernobyl."

Ralph van I, GELIMBO aspi: "Hij komt uit Limburg, dus hij heeft het altijd fout."

Arend en zijn moeder kijken naar Thomas die Niels in het badje duwt bij de Je Moeder-borrel.

Arend: "Ik vond de kandikleding van vorig jaar leuker."

Moeder van Arend: "Dat broekje is wel leuk. Ik denk alleen niet dat zijn zus hem nog aan kan."

Random persoon in de rij van de Python: "Hoezo, alweer een huwelijk verneukt? Leg uit!"

Arend: "Je mag wel schreeuwen, maar dan zachtjes"

Bor voor zijn afstudeerpresentatie: "Mijn moeder vroeg net of auditorium 10 een adres was, dus ik weet niet of ze er op tijd is."

Hondenhaar tijdens GEMOLD: "Er zijn 2 problemen: "1. De turflijst is te kort en 2. Er ligt bijna geen bier meer koud"

Luuk G: "Wat is de vrouwelijke versie van een potloodventer?"

Tim H: "Ja gewoon... Een heldin."

Susan: "Ik hou zelf wel van iets meer tong I guess"

Een recruiter bij de Career Expo: "Oh algoritmes, daar ken ik er wel een paar van. Scrum, Agile?"

Robert: "Die architect van Metaforum heeft volgens mij bij de Efteling gestudeerd."

Luuk G: "Kijk, dan daar word je toch helemaal heet van?! Die gast heeft gewoon een 8-pack!"

Arend stuurt een infimum van Maureen in.

Maureen: "Arend, door jou lijkt ik veel grappiger dan ik eigenlijk ben."

Susan tijdens een regenbui: "Waar komt al dit water toch vandaan?"

Annebelle: "Waarom heeft iedereen zoveel kleren aan?!"

Ava: "Ze denkt dat ze seks gaat hebben, maar ze wordt vermoord, vet grappig"

Sjaars Rick: "Bor, wat hebben Riwal hoogwerkers en de dag van de arbeid gemeen? ZE ZIJN ALLEBEI GEEN DING!!!"

Ian: "Das goeie man, de AV."

Maureen van N bij de thermostaat: "Ik vind het hier warm."

Het licht gaat uit

Wesley tegen Leroy: "Hoe kun jij nou een 10 voor Lipschitz hebben, als je het niet eens kan uitspreken?!"

Levi: "Nou, hij kan het ook niet spellen, hoor..."

Rick: "Wow! Ik ben de printer aan het bijvullen! Nu kan ik secretaris worden!"

Wesley: "Nou, ik denk dat je wel net wat meer moet kunnen om secretaris te worden, toch Nicky? Of doe jij alleen maar de printer bijvullen?"

Ingmar tegen Patricia: "Wat dacht jij vanochtend, ik ga als pauper naar de uni?"

Meeles: "Commissie, zullen we geen brood meer kopen dat 99 cent de neus is, dan wordt je veel te dronken als je de hele dag schulti's aan het drinken bent."

WINFIMUM

The Winfimum is chosen by the editors as the winning, most funny, infimum.

Kees: "Ik ga misschien wel een leaseauto kopen."

Sent in by: Chantal van de Luytgaarden

Luuk G tijdens de pauze van een college: "Heb je er nog een beetje zin in?"

Arend V: "Waarin?"

Luuk G: "Aardbei"

Koen T (kijkend op zijn snapchat): "Hei waarom heb ik zoveel vrienden in België, Oh wacht dat is Tilburg!"

Alba: "Ik ben tot de conclusie gekomen dat als ik minder drink ik echt hogere cijfers haal."





MOMMY

The movie 'Mommy', written and directed by Xavier Dolan, takes place in an alternate version of Canada where any parent has the option to rid themselves of their troublesome children by sending them to an institution. One of the movie's main characters, Diane Després, finds herself in exactly that situation when her son Steve, who has ADHD, gets out of a youth detention center. Diane is immediately presented with the option to send Steve away, but his undying love for her, paired with her own stubbornness and pride stops her from making such a drastic decision. Right from the start this unique family seems to be heading into a disaster but things change when a mysterious neighbour inserts herself into the lives of Diana and Steve.

TEXT Arjen Sijtsma

The concept of a mother struggling with a troublesome child is not all that unique, and even though this movie has quite a few interesting story elements up its sleeve, at its core it still is a film about a dysfunctional family, that has been told many times before. That is not to say that this movie is mundane, since the manner the story is presented in is anything but generic. Characters are extremely well defined and never seem to say or make any decisions which one could consider inconsistent with their usual behavior. Furthermore the exposition necessary to set up these characters is masterfully woven into the dialogue. The movie never really goes out of its way to tell the viewer something about the characters and instead lets it happen naturally throughout its runtime.

What makes the characters shine even more are the amazing actors portraying them. The actress Anna Dorval is quite successful at showing the human side of Diane. When her character is either laughing or crying, it often comes off as genuine. In fact, it comes off so genuine that it is not hard to forget that you are watching a movie and not a documentary. Even when her character is not speaking it is quite clear that, internally, she is struggling with the decision to send her son away in order to live a normal life again. This struggle also resonates within the viewer via Antione-Olivier Pilon's portrayal of Steve. There is always a noticeable sense of built up frustration and when his

violent nature paired with his ADHD sends him on a tantrum, his anger seems real and almost scary at times. Afterwards, there is always a small sense of regret, when he sees the fear he induced in his mother. The mysterious neighbour Kyla is not as in the forefront as Steve or Diane, as she is more of an introvert. That is not to say that this character is very forgetful as Suzanne Clément, the actress behind Kyla, masterfully shows that there is more to her character than first





meets the eye. Every performance on its own was very good, but what is even better is the way the director shows the relationship they have with one another. As a family, albeit a dysfunctional one, Steve and Diane really come off as one that probably exists somewhere in this world and the interplay between them and Kyla is also very believable.

Release date	22 may 2014
Directed by	Xavier Dolan
Written by	Xavier Dolan
Genre	Drama
Running time	138 minutes
Budget	4.9 million
Cast	Anne Dorval Antoine Olivier Pilon Suzanne Clément

Almost the entire movie is filmed with an aspect ratio of 1:1. Characters are literally locked up in a little box in the same way as they are locked up in a lifestyle they cannot get out of. Instead of it being a gimmick, this feature almost comes off as its own character. Because of this small frame in a lot of scenes there really is only one character that appears on the screen at any given time. This really puts the emotions being portrayed at the forefront and further enhances the already great acting performances. As a viewer the small frame made me feel as if I myself was cramped into a little box that I could not get out off. The aspect

ratio is not locked however and when things are looking up for Steve and Diane the frame widens and when the characters finally get their breath of fresh air the viewer experiences the same as they are finally able to escape from that little box they were trapped in. This aspect ratio does have its side effects though, as it comes at the cost of the quality of some of the set-up shots. Some were still fairly well done however, but others probably would have turned out a lot better if it had been done in a regular aspect ratio. This is just a minor complaint, as it really does not matter in the grand scheme of things.

Throughout the movie it does become apparent that there is one big problem with the pace in which the story is told. The movie slows down tremendously just halfway through its runtime and again just before it reaches its ending point. These moments do not last long however, as they are over just before one would lose interest. However, the movie in its entirety would probably have benefited a lot if a good twenty minutes was scraped of its 139 minute runtime.

All in all 'Mommy' is an extremely solid movie with great acting performances at its forefront. Xavier Dolan's incredible use of the aspect ratio provides a unique cinematic experience that is absolutely worth watching. If you are able to take some minor pacing issues for granted, then you should definitely give 'Mommy' a try!





Do you have a question for SupreMUM as well? Leave your question in the SupreMUM box in the GEWIS room or send it to supremum@gewis.nl and you may get an answer in the next edition!

Lieve (Supre)Mum,

Mijn vriend is op dit moment op buitenlandse stage. Hij is al 2 weken weg en hij zal in totaal 3 maanden weg blijven. We houden contact door veel te appen en te skypen, maar ik heb toch het gevoel dat de goede connectie die we hadden toen hij weg ging langzaam aan het vervagen is.

Eenzijds omdat ik best wel veel waarde hecht aan knuffels en anderzijds omdat we nog maar dik een maand samen zijn (goede timing, ik weet het) dus dan heb je nog niet echt iets om op te bouwen.

Heb je tips om deze 3 maanden te overleven? Ik wil namelijk heel graag dat dit goed komt want hij is toch wel heel leuk :D

Lieve schrijver,

Hoewel het op dit moment misschien niet zo voelt, zitten er best veel positieve kanten aan dat jullie al zo snel in jullie relatie geconfronteerd worden met de door jou beschreven afstand. Het lijkt in de eerste maanden van een relatie misschien fijn om heel veel samen te zijn, maar dit heeft ook nadelen.

Zo zijn er veel mensen die juist in deze fase van hun relatie vrienden en familie lijken te verwaarlozen. Omdat jij op dit moment niet constant bij je nieuwe vlam kan zijn, kun je je blijven focussen op de andere leuke mensen om je heen. Je leert hierdoor ook gelijk dat je je prima red zonder je vriend en dat hij er nu ook voor je is, ook al is hij niet fysiek bij je.

Wat ik hiermee wil zeggen is je een sterke basis voor je relatie legt. En hoewel bij hem zijn nu veel belangrijker lijkt dan deze sterke basis, zul je hier over een tijdje positief op terug kunnen kijken.

Daarbij zal het weerzien van elkaar na deze periode extra bijzonder zijn, en hopelijk houd je het met uitzicht op dat moment nog even vol.

Heel veel liefs,
De SupreMUM

Dear SupreMUM,

I often want to drink beer before 4 PM at GEWIS. However, the board does not let me :(Can you help me?

Huggles,
an anonymous alcoholic

Dear AA,

you describe you want to drink before 4 PM often, maybe drinking so often is not good for you and the dear board of GEWIS is trying to protect you and other anonymous alcoholics. Fortunately, there are other ways to satisfy your cravings. For instance going to the Zwarte Doos or The Hubble, where they serve beers earlier. You could even invite a board member to drink a beer with you!

If you're very strong you can also wait until the exam week, the holiday, or the weekends because during those times you may drink beer starting at 2 PM!

I hope this helps you.

Kisses,
SupreMUM



What came first: the chicken or the egg?

We at least know what came third: the philosophical question about this. If we just presume that we are talking about any type of egg, the egg definitely came first. That's because egg laying animals already existed before chickens did. But if we instead require the egg to be a chicken egg, we must look at biological evolution to solve this. Evolution eventually led to chickens. But there must have been some point in history where we can mark the first real birth of what we call a regular chicken. But this chicken must have come from an egg that was not laid by a chicken. So this egg contained the first chicken but was not laid by a chicken, so therefore it is not a chicken egg. So, in this case, we can say that the chicken came first.

Why not?

Yeah sure. Why not have such questions here? Why not disturb a possibility of answering real troubles in the world? Why not let someone think about how they should react to this question? How about: why not never doing this again? Time on my hands is slipping away because of these questions dammit...

Is tomato a fruit?

Wikipedia says that a fruit is something that contains seeds in a flowering plant. Early in development of the plant, a tomato plant has flowers, from which tomatoes will develop. If we also consider the fact that a tomato has seeds, we can definitely say that a tomato is a fruit.

Is het beter om goed geboren te worden, of door grote moeite je slechte status te overwinnen?

Het antwoord op deze vraag is natuurlijk afhankelijk van wat je met het woord "goed" bedoelt. Betekent "goed" hier dat het goed is voor de persoon. Of is "goed" juist op een ethische manier bedoeld, en is de vraag welke van de twee ethisch het beste is. Voor beide interpretaties is het eigenlijk ook een vereiste om te weten wat de persoon met de rest van zijn leven doet.

Voor het eerste geval is meestal het eerste geval beter; terwijl de andere persoon bezig is om zijn slechte status te overwinnen kan de eerste persoon zijn leven op andere manieren verbeteren. Ook is het natuurlijk de vraag of het persoon 2 lukt om zijn slechte status te overwinnen, veel mensen die met een slechte status geboren worden krijgen helemaal niet de kans om hun slechte status te overwinnen. Neem bijvoorbeeld een arbeider uit Noord-Korea. Deze persoon zal nooit zijn slechte status kunnen overwinnen, en zal daardoor altijd slechter af zijn dan bijvoorbeeld Kim Jung Un. Het is dus een risico om met een slechte status geboren te worden. Voor deze interpretatie is het dus duidelijk beter om goed geboren te worden.

Voor de andere interpretatie is deze vraag lastiger om te beantwoorden. Er zijn namelijk meerdere manieren om je slechte status te overwinnen, en er zijn best een aantal die niet echt ethisch verantwoord zijn. Aan de andere kant kunnen mensen die goed geboren worden vaak juist veel meer schade aanrichten door zich onethisch te gedragen. Ik denk dat het antwoord op deze interpretatie varieert per geval.

Als laatste is het natuurlijk belangrijk om hierbij op te merken dat wat de persoon na het overwinnen van zijn slechte status doet met zijn goede status. Het is namelijk ook mogelijk om na het bereiken van zijn goede status of alles te verliezen, of onethische dingen ermee te doen.





MEMBER

WHY PRV'S DO NOT WORK

Every TU/e bachelor is bombarded with them during the first kick-off: Professional Skills (PRV's). All bachelor students have to finish the 6 PRV's every year: presenting, writing, planning and organizing, reflecting, processing information and cooperating. The purpose of these PRV's is to ensure that a student does not only have considerable knowledge in his or her field but also has a head start in the corporate world. Especially in the technological sector, which is not famed for its social skills, this is a pretty good idea.

TEXT Robert de Keijzer

You would expect that the PRV's are embedded in such a way that they resonate well with the curriculum. However, often small projects (which would only take a few days or hours) are being filled up with meaningless planning, compulsory meetings and reflecting every time a group member goes to get a cup of coffee.

An example for instance are the mandatory meetings in the group project of Ordinary Differential equations. In several similar projects the group members themselves decide if a meeting is necessary, which is a natural way of arranging meetings. Instead, these compulsory meetings force a group to fill an hour with meaningless agenda points and reflections.

Another example are the presentations in Numerical Analysis about a walk-through group exercise. Since all groups had almost the same exercise, this resulted in 20 very similar presentations and 1 extremely boring afternoon. Of course a lot is to be learned during these projects, but the obvious goal of the lecturers is to just have the PRV's finished so other subjects can focus on actual content.

Almost the exact same goes for Engineering Design in which the weekly meetings and homework assignments mainly consisted of who lost which screw this time around. This artificial way of forcing PRV's in subjects results in PRV's feeling more like a confusing obligation than a useful addition to your study.

To stimulate this mandatory feeling a little bit more the TU/e decided that subjects cannot be passed if the corresponding PRV's are not completed. Which is strange since the PRV's generally bear no connection to the subjects.

For instance: you can not pass Analysis 2 without reflecting on your first year of Applied Mathematics and you will fail Electromagnetism if you do not make a planning for your bachelor curriculum. But then again, it is common knowledge that the Maxwell-equations were only drawn up after Maxwell chose not to do the USE learning line "the secret life of light".

“ ... PRV's generally bear no connection the the subjects ”

Demanding that PRV's have to be completed results in lecturers not taking them very serious either. It is noticeable that most of the lecturers are of the opinion that the PRV's in their subjects do not account to how well the students know the subject material. At a course-introduction it is, for example, casually explained that the PRV presenting will be graded "sufficient" or "insufficient" but that everyone will always get a "sufficient". And when you will get a "sufficient" either way, why put any effort in your presentation, or even practice it beforehand?

Apart from the forced way in which PRV's are implemented, they are often executed in a quite childish manner. At trainings and presentations the responsible people act as if TU students have never collaborated with anyone in their life and have to receive a (sometimes far-fetched) compliment every time a little bit of negative criticism is given. This results in students not taking these presentations and trainings seriously after which the effects of these trainings fade quickly.

Satisfying the requirements for most PRV's thus becomes more of a pesky routine chore than an educative challenge. With lines like: "distributing the tasks evenly but with a focus on the individual strengths", I often try to just write what the assessor wants to hear instead of what I actually think/believe. Naturally a lot of students would gain a lot from receiving a good training in collaboration, writing and planning, I myself am no exception to that. But no one benefits from hearing the hollow phrase "collaborating is combining individual strengths, qualities and backgrounds", again and again and again.

What I would like to see are PRV's which connect smoothly to the teaching material, which have a clear goal, are challenging and are on a certain intellectual level. A good example of this would be the reports of the models in Probability Theory, but the fact that after 15 minutes I can't come up with a second example speaks for itself. If this is not possible/feasible the TU/e should leave the professional skills to the actual professional workplace.

“ Would I do this in an actual professional setting? ”

I can't emphasize enough how completely useless it is to make a planning just for the sake of making it,

to peer-review each other in such a small project that you have to look up your group members names or to let someone fail an abstract mathematics class because they weren't able to find good citations in an information skills training. When a new PRV is proposed, the responsible people should ask themselves: "Would I do this in an actual professional setting?"

In the end, skills such as planning, writing and collaborating are indispensable in the corporate world. And the TU/e wanting to put effort in teaching these skills is nothing short of praiseworthy. The idea of PRV's is very fitting in a sector known for its inferior social skills. Unfortunately, the forced implementation and childish execution make PRV's into tedious tasks that generally just do not work.



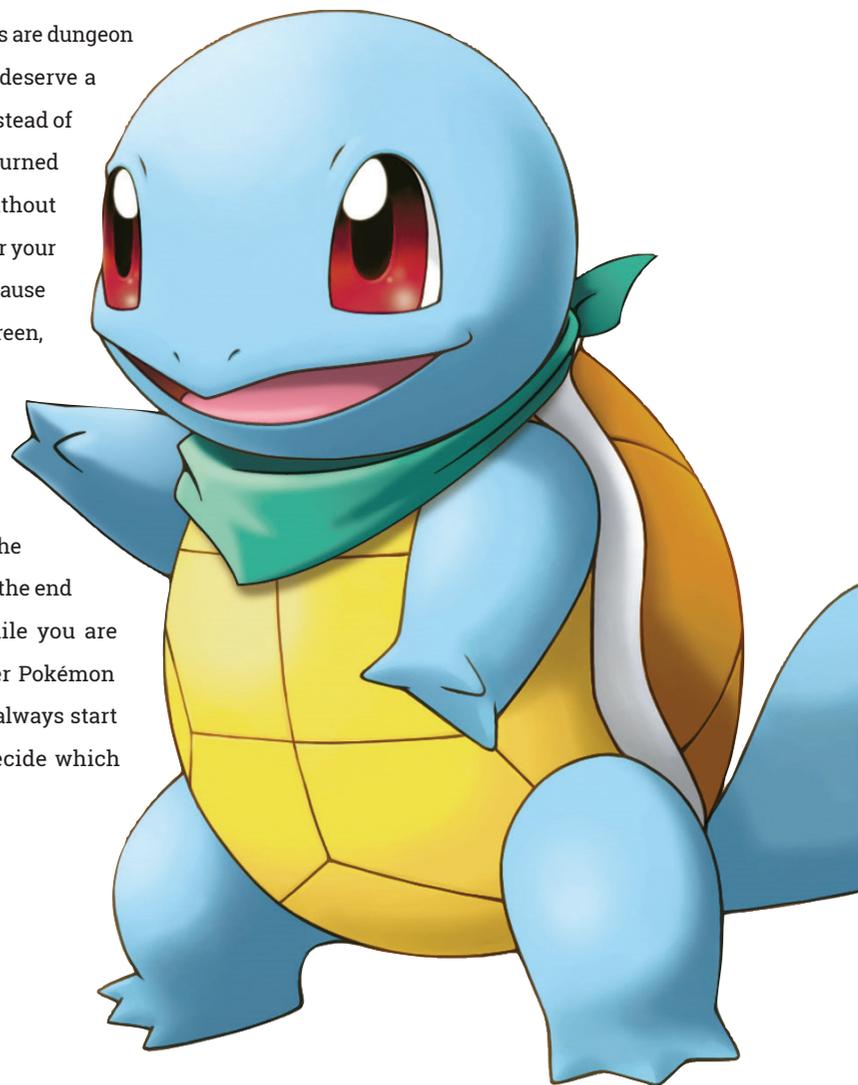


POKÉMON MYSTERY DUNGEON SERIES

It is not a secret that for Super Smash Bros. Brawl battles at GEWIS, I am fond of using Pikachu to Thunder and Thunder Jolt my way to victory (or at the very least to be bloody annoying). Surprisingly enough, the only 'normal' Pokémon game I have ever played is Pokémon Fire Red, accidentally almost doing the Nuzlocke Challenge by curb stomping every single wild Pokémon and rival with nothing but my Charizard. Nevertheless, I have had the pleasure of playing some of the spin-off games, the Mystery Dungeon series being the longest-running. It currently consists of 10 games: Blue / Red Rescue Team, Explorers of Time / Darkness / Sky, the three Adventure Squad games (only in Japanese), Gates to Infinity and Super Mystery Dungeon. In this review, I will review three of these games back-to-back, the latest one per console (GBA / NDS / 3DS). Do the old games stand the test of time?

TEXT Henk Alkema

The Pokémon Mystery Dungeon games are dungeon crawling RPGs - I'm sorry, you don't deserve a cookie for guessing that. However, instead of being a trainer, you play as a human turned Pokémon transported to a world without humans, recruiting other Pokémon for your team. The game is turn-based, and because battles are not fought on a separate screen, but on the dungeon map itself, it is not uncommon for more enemies to show up while you are fighting some baddies. The dungeons are always randomly generated (hence the mystery), and often contain a boss at the end the first time you finish them. While you are basically free to choose your partner Pokémon out of ~15 different ones, the games always start with a quirky personality test to decide which Pokémon you will be.



POKÉMON MYSTERY DUNGEON: RED RESCUE TEAM

2006 - GAME BOY ADVANCE

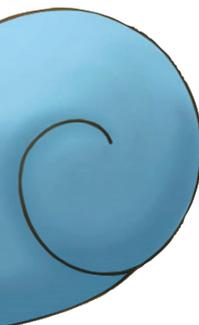
ME: A HASTY TORCHIC

PARTNER: PIKA THE PIKACHU, OF TEAM RESCBDDIES

DUNGEON FLOORS TRAVERSED: 422

SCORE: 3/5

In the first game, natural disasters have started occurring all over the world, so it was up to me (a Torchic) and my partner Pika (together known as rescue team RescBddies) to solve this mystery, while rescuing other Pokémon in need. The storyline is as cheesy as one would expect from such a brightly-coloured game as this one, but still serves a nice purpose to introduce the different dungeons one at a time. As far as the gameplay is concerned, prepare for a grindfest. While the first dungeon is only 3 floors deep, the last dungeon of the main storyline has a whopping 34 stories. Furthermore, later dungeons have much larger floors than earlier ones. It is still very much possible to race through the dungeons, avoiding almost every single baddie on the way. However, to counter this, the game contains some bosses. Hard-hitting bosses, with the added difficulty that if you or your partner dies, it is game over for you. While you lose all your collected items and money, you do keep all the EXP gained, making ploughing (or racing) through the dungeon slightly easier the next time.



As a final gripe, you are not even allowed to directly control your teammates. They are controlled by a bumbling idiot AI, turning the game into one big escort mission (blegh). Interestingly, this is part of the gameplay: you can give specific items

to your teammates to make them smarter. This increases the amount of 'strategies' they will understand and can give some other bonuses. After a while, my main partner Pika was smart enough to wait a turn so he could land the first hit. Near the end, he was a trap-avoiding, thrown-item-catching badass, walking over lava without sustaining a burn and abusing type weaknesses whenever he could.

One thing I couldn't possibly complain about are the graphics. Colourful, customisable and very clear, they pass my judgment with flying colours (pun intended of course). Another great aspect is the music. Even after playing all three games, the tunes of this game are still stuck in my head, brightening up my day with non-stop cheeriness. Finally, there is something strangely addictive about seeing your strength go up. This is most noticeable when doing a side mission in a dungeon you haven't visited in a while, one-shotting your way through the floors, even handling escort missions with ease.

In conclusion, if you are a fan of Pokémon, and would like something different, I would wholeheartedly recommend Red Rescue Team. The completionists can try to recruit 'em all, but be wary: this will require you to conquer multiple 99-floor dungeons. Multiple. Ninety. Nine. Floor. Dungeons. If that's your definition of fun, go for it.





POKÉMON MYSTERY DUNGEON: EXPLORERS OF SKY

2009 - NINTENDO DS

ME: A BRAVE PIKACHU WITH A STATELY SILVER AURA

PARTNER: EVE THE EEVEE, OF TEAM RESCBDDIES

DUNGEON FLOORS CLEARED: 523

SCORE: 4.5/5

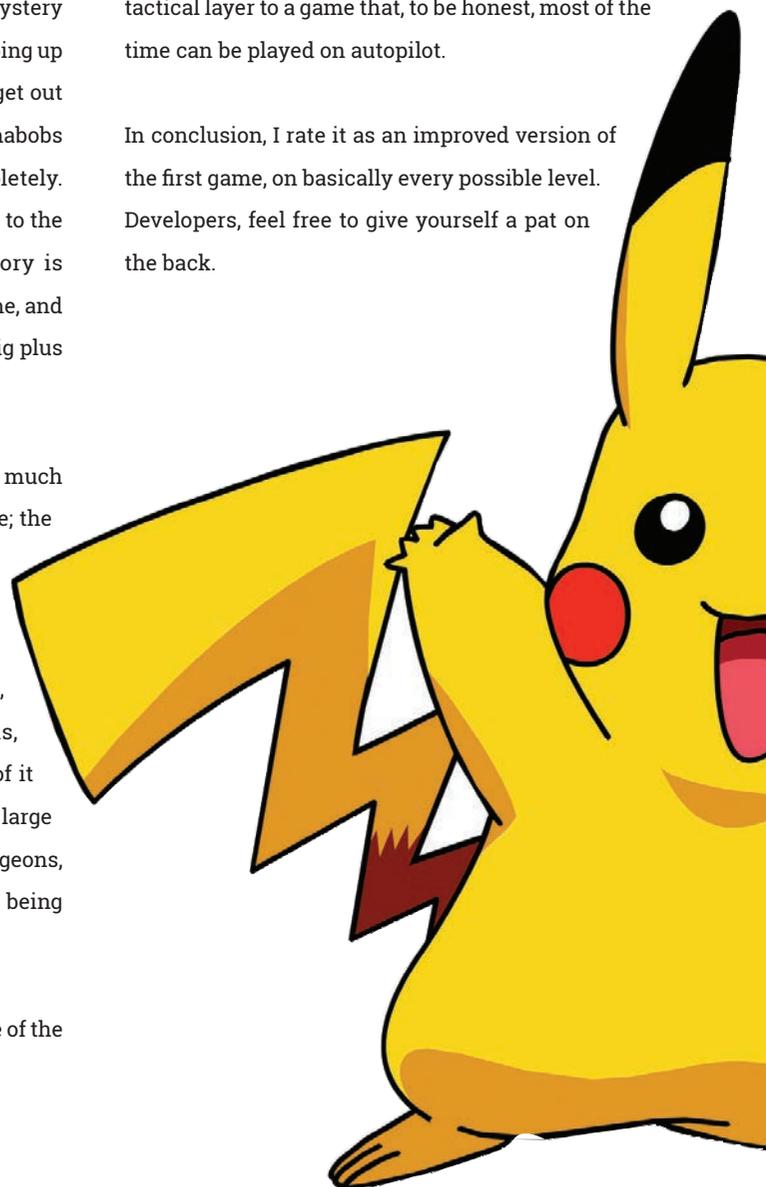
In the second game of the series, I played once again as a human turned Pokémon - a Pikachu, for me. This time, however, my all-too-familiar amnesia wasn't the driving force behind the dungeon crawling. Instead, my soon-to-be-partner Eve the Eevee coaxed me into forming an exploration team ExplBddies with her. So, we joined the local exploration guild full of quirky characters. Time to start exploring all those mystery dungeon that -mysteriously- have started popping up everywhere! Oh, and time itself is starting to get out of whack, and a thief is stealing all the thingamabobs that prevent time itself from stopping completely. Nothing that is going to be of vital importance to the plot later, I'm sure. I have to admit, the story is significantly less cheesy than the previous time, and has a much better pacing overall. That's one big plus for Explorers!

The rest of the game... actually hasn't changed much at all. The quality of the graphics are the same; the 28% increase in screen size does mean more stuff fits on the screen at once, which also makes navigating menus less of a drag. The core game is the same, but there is more of, well, everything. Items, traps, bosses, dungeons, Pokémon - you name it, Explorers has more of it than Rescue Team has. Except for waaaay too large dungeons! Apart from 2 special challenge dungeons, all dungeons have at most 50 floors, with ~25 being normal during the 'meat' of the game.

While in the previous game, all sidequests were of the

form 'find me!' or 'escort me!', Explorers also introduces a new type of sidequests: outlaws. These outlaws have to be found, and defeated before they get to the exit or defeat one of your teammates. Moreover, they are likely to protect themselves by summoning minions that will prevent you from chasing him, or will weaken you before you can take him on. This adds a welcome tactical layer to a game that, to be honest, most of the time can be played on autopilot.

In conclusion, I rate it as an improved version of the first game, on basically every possible level. Developers, feel free to give yourself a pat on the back.



POKÉMON SUPER MYSTERY DUNGEON

2015 - NINTENDO 3DS

ME: A CALM MUDKIP

PARTNER: LUCY THE RIOLU

DUNGEON FLOORS VISITED: 42

SCORE: 4/5

We skip two sets of games of the series, one of which only in Japanese, the other one also for the 3DS, to go straight to the latest Pokémon Mystery Dungeon game: Pokémon Super Mystery Dungeon. No creativity points for the title there. First small difference: while the personality test still assigns you a Pokémon to become, it also chooses your partner. However, you are free to ignore this advice, and pick something else instead.

Gameplay-wise, Super adds nothing significant to the mix. Graphics-wise, however, there is a complete overhaul, and luckily, the 3DS has the screen real-estate (~56% more than the DS) to make it work. The menus and key bindings have been improved, making all your special attacks easy to use.

However, I have one big gripe. You're a kid. Everybody just calls you 'kid' or 'kiddo'. You can't do anything, because you're a kid. Nobody takes you seriously, because you're a kid. It shouldn't bother me, but the game just crams it through your throat and reminds you all the time, destroying every shred of immersion I tried to feel. Unfortunately, due to technical reasons I haven't been able to get far into the game, so I cannot tell whether this problem is resolved over time. Either way, be prepared for a rather frustrating first few chapters.

In conclusion, I'm divided. I really, really shouldn't care that much about the story. Maybe I've just been playing too many Mystery Dungeons, maybe I haven't, who knows? My personal favorite is still Explorers, but you probably like all three of them, or none at all. Therefore, I recommend playing them in order, starting with the simpler Rescue Team and working your way up in complexity. Whatever you decide to do, don't forget to have fun!



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GEWIS Ervaart Het Algoritmisch

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GEWIS Eet Ijsjes Lekker

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The *Supremum* is the magazine of study association GEWIS and is published four times a year with a circulation of 1000 copies. The *Supremum* is distributed to members of GEWIS and employees of the Department of Mathematics & Computer Science of Eindhoven University of Technology.

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THANKS TO

All writers for their articles, our sponsors and everyone else who has helped creating the *Supremum*.

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MAGAZINE DESIGN

Alex Dings, Stephan van den Berkmortel

COVER CREDITS

Picture: Max Langerak

OTHER CREDITS

Activity pictures: GEFLITST

TECHNICAL INFORMATION

Body font: Roboto Slab

Headline font: Franklin Gothic ...

Formatting: Adobe InDesign

Printing: Gildeprint

Circulation: 1000 units

Juli 2018



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