DisCover

Magazine of Study Association Cover – No 1 – 2018

COLOPHON

DisCover is a magazine published by Study Association Cover and distributed among its members, Bernoulli Institute staff members and other interested people.

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Cover

EDITORIAL

When I started studying in 2012 (yes, I'm old), I did not immediately become active within Cover. There was, however, always one link that I had with the association: its magazine, the Brainstorm. Over the following years, this magazine kept me at least slightly up to date on the goings-on of Cover and the research institutes. However, interest in creating a magazine dwindled, and eventually it was disbanded.

Over the following General Assemblies, there was often a discussion whether we should keep money reserved for a magazine, of which I was always in favour. A magazine is for every member of the association, active or not. But I never had the time or inspiration to set up something myself.

Fortunately, Martijn has more inspiration than me. He had thought we could create a yearly magazine with a more coffee table book feel. We decided to convince the board to let us set this up. They quickly were on board with this plan, and at the following GA we got the money needed to print a magazine.

In the meantime we had asked Jan mainly to be the copy editor, because of his impeccable language skills, and Brainstorm-veteran Annet joined us to mainly help out with the layouting of the various articles, meaning we could get to work. Over the last half year we have gathered and created content for all of you to enjoy. Now we are nearing the moment where we can get it printed, and I have to say that I am quite content with how it panned out. I am happy that Cover will have a magazine again!

René Mellema

CONTENT

THE BOARD'S LETTER

Dear reader,

I'm very proud and honoured to be writing for the first edition of DisCover. We, as the board, are overjoyed that an enthusiastic group of people have created this magazine. Therefore, we want to thank them, as well as everyone else who helped them out by writing pieces.

At the time of writing, the LustrumCee is already planning a brilliant week of activities to be held in September, when Cover will celebrate its fifth lustrum. In its twenty-five years, the association has changed a lot. We started as an association for Artificial Intelligence before adopting Computing Science as well. Both studies are now growing incredibly fast, which will bring us new challenges and opportunities, soon to be faced by our lovely candidate board.

But what about the far, far away future? Twenty-five years from now, Cover will be in its tenth Lustrum and all the current students will (hopefully) be done with their studies. We will take the electric self-driving bus or car to work. We will go to the alumni events and not recognise any of the students anymore. But we will live in a society that is shaped by our disciplines: computers and artificial intelligence are already seen everywhere, and that will only increase in the future. We are the ones who have the opportunity to work on those self-driving buses, and many more possibilities are opening up for us to show our creativity in. We at Cover aim to help you learn to make use of these possibilities. We hope that we can support you and that Cover will have a place in your heart for another twenty-five years.

Also, will somebody finally invent safe Jetpacks by then? We want what was promised to us.

On behave of board XXVI "Sharp",

Nico Stegeman

September

October

November

December

January

February

March

April

May

THINGS THAT HAPPENED THIS YEAR

2017-09-08: COVER INTRODUCTION CAMP

2017-09-20: COVER TURNS 24

2017-11-15: DISRUPTIT
The 2017 edition of the Dutch CS conference (SNiC) was organised by Cover members.

2017-11-21: U.S.A.
30 Cover members visited the U.S.A. west coast.
See also page 6

2017-12-14: NET NEUTRALITY REPEALED IN THE USA

2017-12-21: CHRISTMAS GALA

2017-12-17: BITCOIN PEAKES AT A VALUE OF $20K

2018-02-06: FALCON HEAVY TEST LAUNCH
After years of development, SpaceX successfully tests the Falcon Heavy rocket.
See also page 8

2018-01-03: SPECTRE & MELTDOWN MADE PUBLIC
Two security vulnerabilities that affect all modern CPU architectures are published.

2018-03-14: STEPHEN HAWKING DIES AGED 76

2018-04-10: MARK ZUCKERBERG TESTIFIES BEFORE U.S. CONGRESS
Following the Facebook-Cambridge Analytica data scandal, Facebook CEO Mark Zuckerberg testifies before U.S. congress.

2018-02-22: MEET THE RESEARCHERS
CS and AI staff tells about their research.
See also page 20

2018-03-23: MEMBER WEEKEND

2018-04-20: LAN PARTY: LA LA LAN

2018-05-25: GENERAL DATA PROTECTION REGULATION IMPLEMENTED
The new European data protection laws are implemented to protect the privacy of EU citizens.

2018-05-01: KICKSTART YOUR OWN CAREER

COVER TO THE USA

At the end of 2017, thirty Cover members made a trip of a lifetime to the west coast of America organised by the MxCee. They visited Los Angeles, San Francisco and Seattle. The main attraction was of course Silicon Valley, but they had many other adventures.

Annet Onnes

Our exploration of the American west coast started as we hopped off the plane at LAX and crammed ourselves into the free airport shuttle. The regulars, airport personnel, had never seen the bus so full, thirty twenty-somethings with thirty pieces of luggage good for three weeks of travelling.

Since we were in LA around Thanksgiving, there were no university or company visits on the schedule, but mostly free time and exploring the culture of the city. A highlight here was our visit to the observatory (featured in La La Land). We had a breathtaking outlook over the city, which reached as far as the eye could see. From the observatory grounds we also had a good view of the Hollywood sign. We enjoyed a planetarium show and after that we stayed to watch the sun sink into the sea beyond the Californian coast.

After LA we traveled to San Francisco, where the majority of our study-related activities were planned. Although we had five days full of activities, one day was absolute stuffed. From an initially pretty unknown company, Palo Alto Networks, we went on to Stanford where an undergrad and a PhD student gave us a tour. Following was Facebook, the HQ of which reminded us more of a Disney Theme park than of an office campus, and finally, we had to rush to Google to meet

Laurens. He showed us the Google grounds, before we headed to his own workplace, Waymo. After a brilliant Q&A session, we were done for the day.

During this super busy day some of us were invited to a real American college frat party by the undergrad student, Midas. The party was the following Saturday, so we would still be in SF.
Most of the partygoers had a great time, though for one of us, next day's boat trip to Alcatraz was a little too much. We had booked the much sought after night tour to the this prisoner island where El Capone was detained. Starting with a beautiful boat trip at dusk, we explored the prison using an audio tour voiced by prisoners and employees.

On the last day in San Francisco, a free day, many of us decided that we could not miss the Golden Gate Bridge. Since we came from the Netherlands, what better way than cycling? Since everyone went their own way, some of us decided to really go for it and cycled all the way through the hills on the north side of the bridge, to Hawk Hill. When I crossed, the winds were so strong I literally got blown off my bike. The wind was harsh, but the views were astonishing!

We roadtripped our way north to Seattle in five minivans, and two weeks after we were sweating in LA (where it was over 30°C), we enjoyed left-over pizza at Lake Tahoe, at an altitude of 2100 m, in the freezing cold. We also stopped at Yosemite and Portland, where we had only 20 hours and stayed in a unexpectedly fancy hotel. If you are looking for any book, Powell's will have it.

In Seattle we went up the Space Needle and visited the Chihuly Garden and Glass exhibition. Here we learned that glass is coloured by adding small pieces of coloured glass. And where do those come from? Well, Germany, apparently. During our tour of Seattle we also visited one of its world-famous attractions, Pike Place Market. We were lucky and arrived just in time for one of the fish throwing spectacles. Besides the fish there are many other little shops and when you walk to the other side of the market you get a spectacular view of the waterfront of Seattle.

For the final act, we visited Microsoft. This giant of modern technology has decided against exchanging the rainy Seattle for sunny Silicon Valley and has over the years built an extensive campus in the northwest. Here we enjoyed tours of the hardware lab, server rooms and studio, and we were shown technology to help people with multiple sclerosis. It was a fitting finale to a great excursion.

These were only some of the highlights according to the participants, but we also visited many other companies and cultural attractions.

BUILDING AND FLYING IMPOSSIBLE ROCKETS

How SpaceX revolutionised the space industry

Imagine you are standing at the entrance of the Empire State Building. Someone comes up to you and says “I’m going to throw this pencil over the Empire State Building, and have it land on its eraser on a shoe box”. Would you believe him? Well, this person would be Elon Musk and he actually managed to do so. He did cheat a little bit though: he slapped 9 rocket engines, some avionics, landing legs, and grid fins on this pencil and called it the Falcon 9.

Even with all these enhancements, landing a 46 m tall rocket only a few meters from its target is an amazing feat. After the first stage[1] has done its work, it separates from the rest of the rocket at an altitude of around 80 km, travelling at 7000 – 9000 km/h, faster than any aircraft currently operational. If it were to re-enter the atmosphere at this speed, it would be torn apart immediately. The only way for it to slow down is to turn around and fire its engines, which got it there in the first place. Upon re-entering, it will slow down drastically by just air-resistance, but this is not enough. At about 3 km altitude and a speed of 1000 km/h, one of its engines will light up a final time.

There’s a problem here, however. One engine, by itself, throttled down as much as possible, produces enough force to lift the entire first stage. This means that the remaining engine has to perform a so called “hover slam”: altitude has to reach 0 just before speed reaches 0. Any error in timing or throttling, and the rocket will crash into the ground or sea.

Keeping this in mind, it is clear why everyone thought reusability, hell, even landing the rocket was impossible. However, on the 21st of December 2015, after many failed attempts the first ever vertical landing of an orbital class rocket on the ground . Soon after that, on the 6th of April 2016, they did it again while flying a spacecraft to the ISS for NASA, but this time on a big barge floating in the Atlantic Ocean. Shortly after that, they flew a used rocket for the first time ever for mission SES-10. All in all, the amount of boosters SpaceX has landed and reused by now should be enough to silence most critics who thought reusability was impossible.

FLIGHT STATISTICS	SUCCESSES/ATTEMPTS
Falcon 9 launches	54/56
Falcon Heavy launches	1/1
Landed boosters	25/31
Droneship landings	14/20
Ground landings	11/11
Reflown boosters	11 (6/6 landed)

as of 2018-05-24

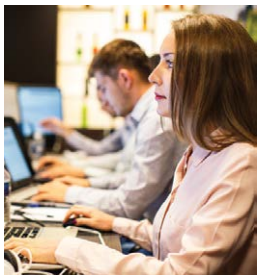
SpaceX is not even close to done; their plans for the future are even more ambitious than ever. Currently they are developing a new rocket called BFR, the Big Falcon Rocket. This rocket will not only be the largest and most powerful rocket ever built, it will also be the first one to be 100% reusable. With its first tests scheduled for the end of 2018, the goal of this rocket will be to send humans to Mars to create the first extraterrestrial colony and lay the foundations for multiplanetary life.

Stijn Kramer

1 Most rockets consist of smaller rockets, called stages, that separate in flight to get rid of unnecessary mass.

The sky is not the limit!

HTG is a leading international distributor of Liquors and Health & Beauty products serving retailers (B2B), local distributors and local wholesalers with an assortment of A-brands and private labels worldwide. Through a concept of source, serve and supply, HTG sources products internationally at highly competitive prices. Making use of our fully automated and AEO certified warehouses, these products are stored in perfect conditions in a reliable and cost-efficient manner. These products can then be delivered internationally in varying order sizes and frequencies giving our customers the most efficient and flexible acess to luxury branded products.



Each day, we have around 60 eager IT-employees in various locations in the EU and Middle-east working on the implementation and maintenance of the newest (information-)technology to realize our planned growth and development. We are one of the first companies in Europa to have fully implemented the AutoStore system in our logistic processes. Day and night, around 40 robots are busy picking orders for us and we plan to expand again soon.

Besides AutoStore, we are also busy with implementing the Microsoft HoloLens to improve our logistic system. Would you like to contribute to this project? We are looking for students in short-term who would like to do projects related to the HoloLens!

Within the IT-department, we offer both internships and traineeships to Young Professionals. Check our website for more information and current vacancies: www.bs-htg.com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WHY HAVEN'T UNIVERSITIES CHANGED?

Technology did and so did online video

After finishing his PhD in atmospheric physics Simon Clark opted for a rare career path, since September 2017 he has been working as a science communicator/YouTuber. In this article he chronicles how he came to this career, the past, present and possible future influences of video blogs like his and how they relate to the universities as organisations.

Simon Clark

When I was a child in the rural west country of England, I'd never met anyone with a PhD. I didn't even know what the letters stood for. As a matter of fact, until I went to secondary school at age 11, I'd met very few people with a degree of any kind. No one in my family had been to university; my father joined the navy at 17, and my mother had been pulled out of college by her parents. So when I was accepted to study physics at the University of Oxford, I was plunged into a whole new world.

Did I need to speak Latin? Did I have to own a gown? What jobs could I get with a physics degree? Was I going to be quizzed on obscure bits of knowledge every day and be expelled if I couldn't answer? How was I supposed to organise my time?

In 2009 it was difficult to get answers to these questions if you didn't know someone who had studied at Oxford, which was all but impossible in situations like mine.

Between reading articles in the newspaper, endless Google searches, and what I could gleam from TV, the single most useful experience I had in finding answers was a three-email conversation with a current physics student at Oxford. Organised by a mutual friend, I received short, clipped responses to my queries which reassured me so incredibly much. They reassured me not because they were authoritative, but because they came from a real, genuine person. A real Oxford student who had lived these answers to my questions.

Fast forward four years.

I was getting ready to start my PhD. At the same time another cohort of students was getting ready to begin their degrees at Oxford, some of them as clueless as I was. But this time things were different. Every student had access to the experiences of a current Oxford student, who would answer their questions if they but asked. Of course, the person was me. I had set up my YouTube channel as soon as I had arrived in Oxford, with precisely this goal in mind. I wanted to help students who found themselves in my old situation.

But instead of having a three-email conversation with each student I was using videos. If a picture is worth a thousand words, I was sending twenty five thousand words a second, for five minutes each week, to a growing audience of students. The rise of

video blogging allowed for effective communication of personal experiences such as mine, making the experiences of students at universities like Oxford that were once far, far away suddenly accessible for students all around the world.

There is one specific societal change that has allowed for the success of video blogs as a tool to make the far away seem close by, and that's the near-universal adoption of camera phones. It may seem unrelated, but the fact that every phone now

> "twenty five thousand words a second, for five minutes each week

comes with a high quality video camera means that almost everyone is taking videos and sending them to their friends. Instagram stories. Snapchat. WhatsApp. When people see footage shot on a smartphone they subconsciously associate the filmmaker as an individual, free of institutional bias. Just someone showing what their life is like, with no incentive to lie or deceive.

Traditionally universities have reached out to applicants with print media, or more recently through highly produced, corporate, online videos. Soft-focus libraries with attractive smiling students. The kind of media that all applicants could tell was not representative of real day-to-day student life. Applicants had to make decisions about where to study based on a dream of student life which they, consciously or not, knew was a carefully constructed lie.

The rise of video blogging, and the associated *verisimilitude*[1] of the format, has allowed for a new generation of students to make ever more informed decisions about where and what they will study. Thinking of studying at a particular university? Search YouTube for vloggers who study or have studied there. If they haven't made a video about the student experience, just ask them in the comments! If you give everyone in the world a camera, and the ability to answer questions if they are so inclined, suddenly the world is much smaller, and the far, far away very, very close.

Institutions still need to catch up to this change in technology. What role can a university play in promoting itself through the voices of individual students? Certainly not by censoring their content, but perhaps in establishing networks and support structures to allow for web content, and vlogs in particular. But then at what point does the support given by a university become restrictive? Either by direct or implied threat, will students one day not be allowed to post their true feelings about their university on public social media? Will we eventually look back on this period in Internet history as a wild west time of student made content, unregulated by the institutions students attend?

I certainly hope not. As I am reminded every day, there are students all over the world in need of real, honest answers.

Simon about Simon

I've been making videos on YouTube since 2010, and since then have completed my masters degree in physics and PhD in atmospheric physics. My videos are mostly about stuff I find interesting - maths, science, history, music, etymology, video games... but with a focus on what I've researched during my degrees. I also run a not-so-serious podcast about random Wikipedia articles, The Wikicast, and I'm available for presenting and video production work.

simonoxfphys

@simonoxfphys

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1 The appearance of being truthful, without necessarily being true.

TINY WHEELS MACHINE FOR HIDING MESSAGES

Explained using the ten hundred words people use the most*

When you want to hide messages, you can change them letter by letter to something that nobody understands. If someone else knows what you did, they will be able to change it back to the real message. Anybody who doesn't exactly know how you hid your message, has to do very hard work to be able to read the real message.

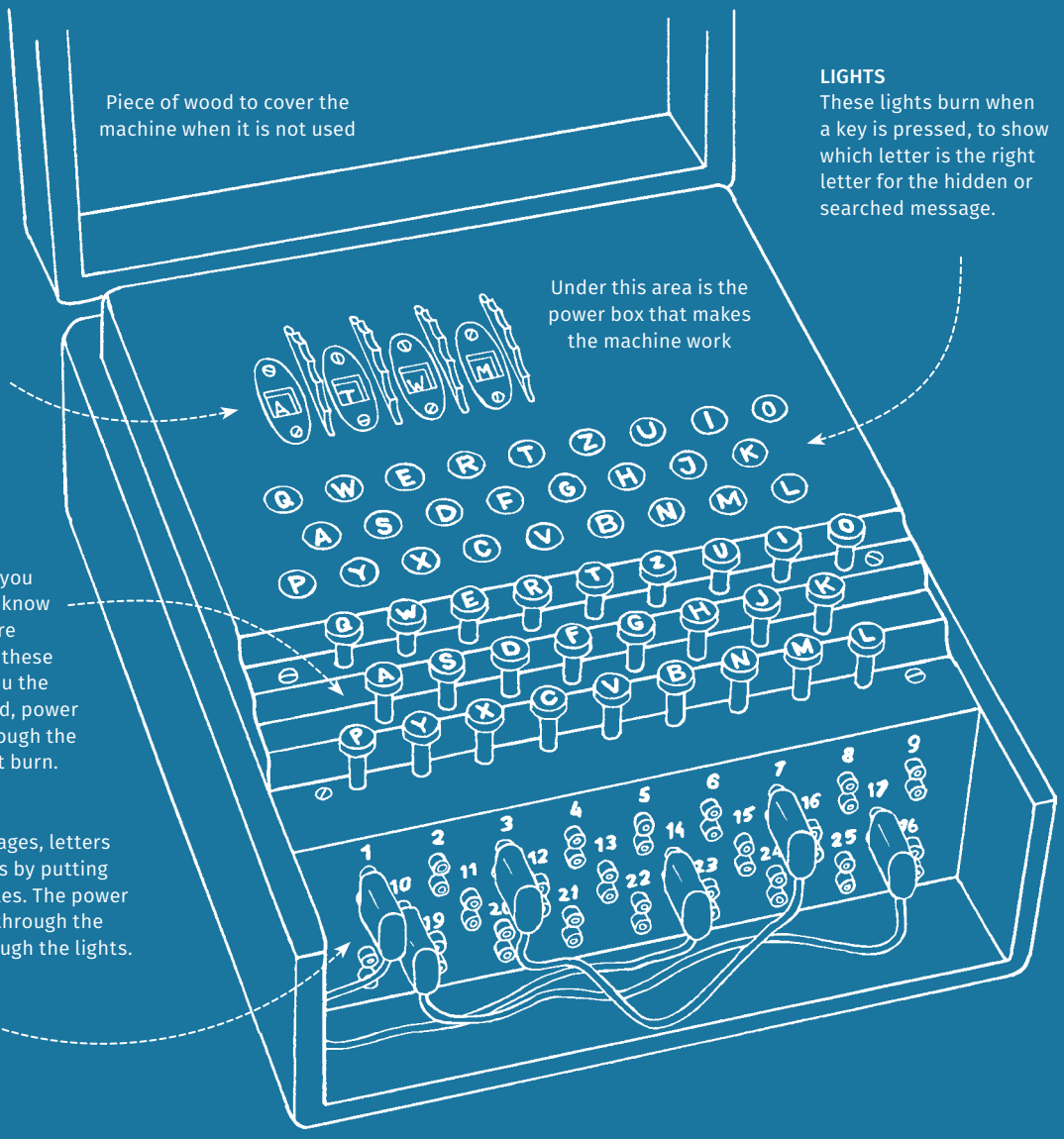
A little less than a hundred years ago, this machine was created to help hiding messages. It could also search messages if you knew the settings used for hiding. During the Second World War, one country decided to use this machine to hide their messages. The other countries decided to search for the messages, but they had to find the right settings first, so it was very hard. But in the end, they found the settings and that helped them win the war.

Martijn Luinstra

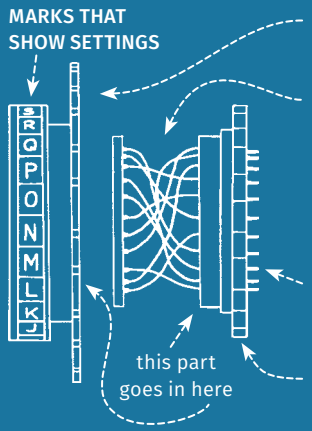
TINY WHEELS
These small wheels are used by the machine to hide messages. When a key is pressed, the machine sends power through all wheels. Then, the part next to the last wheel sends the power through the wheels again, following a different path. After a key is pressed, one or more wheels roll to the next position. The wheels can be changed for other wheels.

KEYS
If you want to hide a message, you press these to let the machine know what you want to hide. If you are searching a message, pressing these will make the machine show you the message. When a key is pressed, power is sent from the power box through the machine to make the right light burn.

POWER LINE HOLES
To make it harder to find messages, letters can be changed to other letters by putting power lines between these holes. The power will be sent here after it went through the wheels and before it goes through the lights.



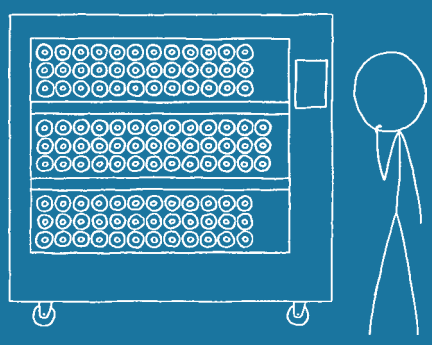
INSIDES OF TINY WHEELS



MANY WHEELS MACHINE FOR FINDING SETTINGS

This machine was created by the man who thought of a simple machine that could do anything a computer can. It has many wheels that try out settings to see if they are right and it was used by the countries that wanted to find the messages hidden by the tiny wheels machine.

This machine worked because the tiny wheels machine never changed a letter to itself and because people used the same words in many messages. Without this machine, the war may have been won by other countries.



* Created to be like Thing Explainer, by Randall Munroe (known from *What if?* and *xkcd*)

Best of Both Worlds

The future of artificial intelligence with Bart Verheij

Last September, Bart Verheij became the chair of Artificial Intelligence and Argumentation. For this, he gave his oration, in which he spoke of a divide in the field of Artificial Intelligence. Annet and I went by his office to ask him more about this divide and its implications for the field.

René Mellema

According to Bart, there are two central types of Artificial Intelligence: data technology (which is machine learning), and knowledge representation and reasoning (which consists of logic-based approaches and uses explicit modelling of knowledge and reasoning).

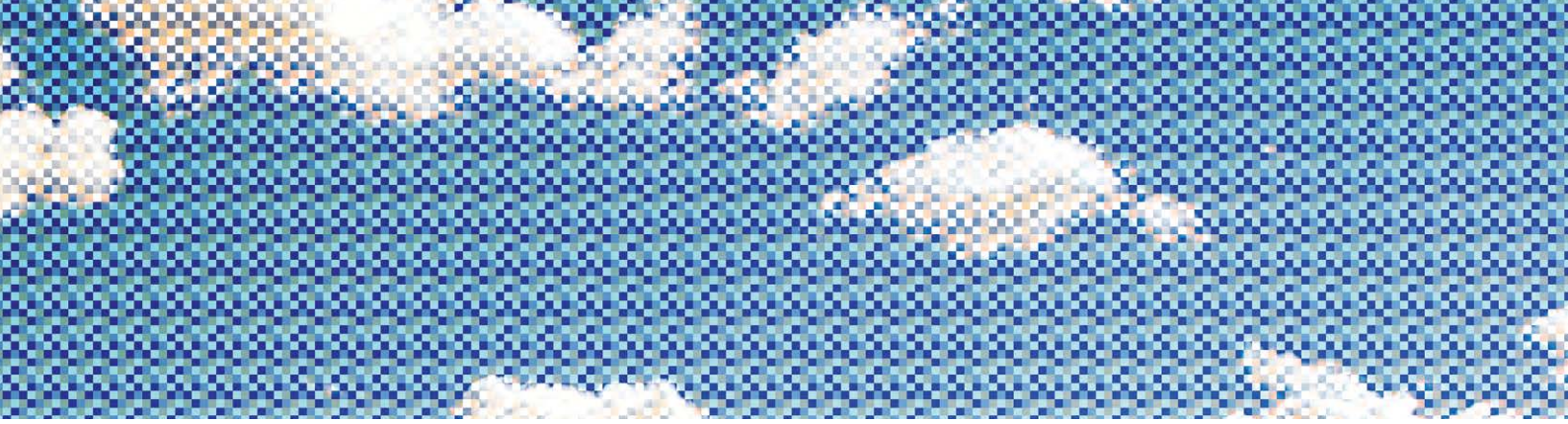
Bart believes the field of AI should find its way out of this two-camp situation. With his background in mathematics and argumentation, he is in the camp of the logical approach, but he does think that the other side has much to offer, because it is able to learn, a skill that knowledge technology lacks. On the other hand, machine learning is unable to explain why it produces the results it produces, something knowledge and reasoning systems can do. If we can bring these approaches together, the field of AI can make a lot of progress.

One of the ways in which Bart is trying to do this, is by studying the interaction between logic and probability theory. A lot of machine learning is based on probability theory, so if we were to combine these two, we could create learning knowledge structures that will keep their ability to explain their answers. This mix of an ability to explain what is understood of the world and adaptability in knowledge structure is also what Bart sees in humans, for example in the process of science as well as in the development of children.

We also asked Bart what he thought were the desired properties of such a combined artificial intelligence. According to him, a good artificial intelligence has three properties. It is able to a) give good answers, b) for the correct reasons, and c) to make good choices, keeping the relevant ethical questions in mind. All of these things are easier with knowledge technology. First, knowledge technology has a concept of a correct answer, while data technology does not. Second, it is a recognized problem in Machine Learning that most algorithms result in black boxes, and are not able to give reasons for their results. Knowledge technology, by contrast, has no problem with this. Lastly, data technology is a descriptive technology, which means it will always mimic the data that it is given. So if the data is ethical, there is no problem, but most data is messy and weird. An example of this is Tay, the Microsoft twitter bot, which was shut down because it was fed inappropriate (Nazistic) data. With knowledge technology, the knowledge is explicit and you are able to correct the rules in the system afterwards. Howev-

er, if we were to only use knowledge technology, the system would not be able to learn and adapt. Therefore the combination is necessary.

Finally we asked Bart what the end result of developing AI will be, and he told us that he is not afraid of the singularity. Bart believes that good AI can only be achieved by using argumentation and critical thinking. He even goes so far as to say that these are necessary parts of intelligent behaviour. This is in a way supported by the fact that this is also the core quality of academics. If that is true, all super-intelligences also need to have critical reflection. Now, in order to have self reflection, one needs a standard to compare against. Bart thinks this standard is by definition normative, since it says something about how the super-intelligences should behave. Their norms and our norms could differ, so the best, and maybe only, way to build a society that encompasses super-intelligences and humans, is to make sure that there is enough overlap between those norms. If there is not enough overlap, then we could end up in a situation where we are to the super-intelligences as ants are to us. The super-intelligences would neither care for us, nortake us into account when they make decisions. However, if we can make sure that there is still enough interaction, then we can try to educate them within our society in order to shape their norms, much in the same way that we do with children. Most people end up as decent human beings, so there is a good chance that this approach would also work for super-intelligences. This does not mean that there won't be rogue AIs, but it will hinder their development. In that scenario, we will not become their slaves, but the previous generation of sentient beings — a significantly better outcome.



12 THINGS PEOPLE WAIT FOR IN THE CACHE. #7 WILL SUPRISE YOU!

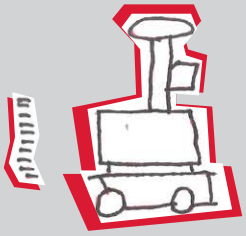
1. Bread rolls
2. A spot in the study landscape
3. The freezer
4. The photos of the last social
5. Someone to do the dishes
6. Our grades
8. 4 o'clock
9. A lab partner
10. Number 7
11. Hearing the integer between 0 and 2
12. The end of the rain

How to time travel – Easy tips from the Pros

1 **Groundhog Day (1993)**
You can just go to sleep. Or die. Either is fine, really.

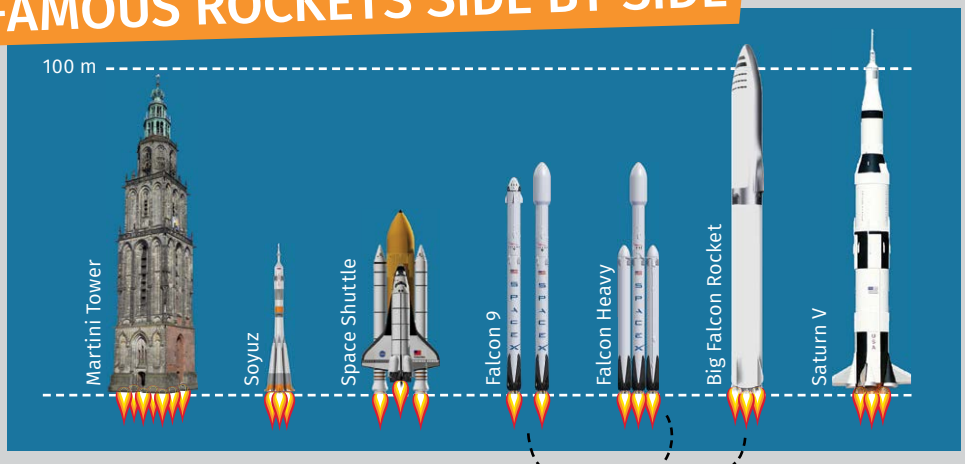
2 **The Butterfly Effect (2004)**
We don't particularly recommend it, but if you insist: read your journal.

3 **Steins;Gate (2009)**
Fact: microwaves make excellent time machines!



Did you know that the Wikipedia page for John Locke, the philosopher, is only 2^8 words longer than the Wikipedia page for John Locke, the character from television series Lost?

FAMOUS ROCKETS SIDE BY SIDE



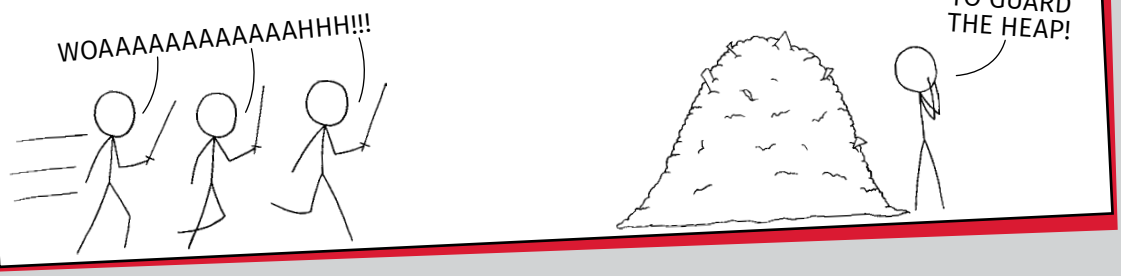
see also page 8

What DisCover could have been called

Coverview
Covert content (Coco)
Coverse
Covfefe
Gerard
Kevin
The Other Yearbook (TOY)
Cover Redacted

The chance of precipitation reported in weather reports is the probability that it will rain during the time period (normally a day or an hour), where rain is defined as precipitation of at least 0.3mm. It says nothing about the duration of the rain itself.

Mayhem in Algorithms & Data Structures



FIVE WORD TECH HORROR STORIES

I *think* we have backups
It won't happen in production
/* My random number generating function */

WHICH YANNICK ARE YOU?

DID YOU KNOW THAT

italic type is called *italic*, because it was invented in Venice, Italy in the year 1500, to improve the legibility of small print in pocket books.

THE 5 BEST NEWSLETTER JOKES
in no particular order

I was fired from the keyboard factory today.
I wasn't putting in enough shifts.

Two atoms are walking along. One of them says:
"Oh, no, I think I lost an electron."
"Are you sure?"
"Yes, I'm positive."

Why can't atheists solve exponential equations?
Because they don't believe in higher powers.

I read a book on anti-gravity,
I couldn't put it down.

When Brexit happens, how much space will the EU lose?
Exactly 1 GB.

HAHA HAHAHA

WHISKEY OR WHISKY?

Did you know that whiskey is only spelled "whiskey" if it was made in the US or Ireland? If it was made in any other country (such as Scotland) it's spelled "whisky".

Scientists hate them!

Tranquil campus in a buzzing city

Hong Kong: A densely populated concrete jungle where you breathe just as much smog as CO^2 on an average day, right? If that is your image of Hong Kong, you're partly right but you may be in for a surprise!

Lex Koelewijn
3rd year AI BSc student

Back when I started my Bachelor in Artificial Intelligence I wasn't sure about much except for one thing: I knew I wanted to study abroad. After a long time of going to information days, looking up things and doing all the necessary preparation, I finally got to go this year. Now I'm doing the second semester of my final year at the Hong Kong University of Science and Technology (HKUST). As I'm writing this, I'm sitting on the balcony of my dormitory and my view consists of the ocean, mountains and a lot of green... pretty sweet right?

HKUST is one of the thirteen universities in Hong Kong and our campus is located on a hillside adjacent to the ocean on the outskirts of Hong Kong. This means that rather than being surrounded by a buzzing city, we live on a tranquil campus with fresh air and chirping birds - we even have our own beach. I cannot convey in words how absolutely stunning the campus is, it amazes me every single day. An interesting

point to note is that because the campus is built on a steep slope, I have to take three long elevators and a bunch of escalators to get to class from my dorm. That's how big the difference in elevation is.

One of the most amazing things about Hong Kong is that the actual city itself indeed is an extremely dense and busy concrete jungle filled with skyscrapers and apartment buildings. However, that part of Hong Kong is surrounded by beautiful scenery, mountains, waterfalls, beaches and forests, so one of the most popular ways to spend your free time here is to go hiking. Most of the trails are just gorgeous and provide you with exactly that contrast of looking out over the busy city whilst you are, in fact, enjoying a peaceful hike.

Hong Kong is one of the most westernized places in Asia, but I still had to get used to quite some things. The food is one of those matters: I do actually really like Asian food but it still is very different from the food back home. I'm fine with eating rice for lunch and dinner but seeing as I'm a little stubborn, I refuse to eat rice for breakfast. Luckily for me, I am not the only non-local on campus so I can get my precious bread in the supermarket on campus. Since I have the motor skills of a two-year-old, eating with chopsticks is really difficult for me, but admittedly I am getting the hang of it! (After two months.) In all honesty though, the food here is really good so you won't hear me complaining.

Another aspect is living in dorms: I never had a roommate before in my life and given that your roommate can make or break your stay, I was pretty nervous about this. I got extremely lucky though: I have a really cool American roommate, two Indians and an Irish as neighbors, and we've all become

good friends. There's no privacy whatsoever, but I'm constantly surrounded by people I really like, so that is a load of fun. From crazy drunk stories to pranking wars, I really am living the stereotypical college experience right now.

Finally, I'd like to share some random facts or quirky things that I have noticed during my stay so far:

- Very little to no veggies are served with most meals and it's all based on meat, so I feel bad for vegetarians here.
- People tend to walk very slowly and not in a straight line, which makes it very hard to pass them. This really bugs me, especially before I've had my morning coffee...
- Please don't make the same mistake I made: do not take a Chinese class. It's extremely difficult, especially since your intonation completely changes the meaning of a word.
- Seeing as I'm tall and white I constantly draw attention to myself, I regularly get stopped by people who ask whether they can take pictures with me.
- Hong Kong University (HKU) is the main rivaling university and this battle is fought through Facebook meme pages roasting each other, which is extremely entertaining.
- People go to the gym in (skinny) jeans. Which has to be really uncomfortable.

I feel so lucky to have gotten this opportunity because my entire stay has been absolutely amazing so far. The city is great, the scenery is amazing and I've met so many wonderful people, it's an amazing experience. So if you ever get the chance I would definitely recommend that you go and study abroad! And as far as Hong Kong goes, it's a wonderful place that keeps surprising me every time. I love it!

AI and CS staff members tell about their current research projects!

Alexander Lazovik (room 568)
Distributed Systems

The Distributed Systems group performs fundamental research and delivers education at the frontier of the state of the art in dynamic complex distributed systems using formal engineering tools and seek applications with societal impact. Over the last decade the main research interests covered the areas of AI planning and discrete optimization in highly distributed environments, having Internet-of-Things, building automation, large-scale data analytics, business processes and energy distributed infrastructures as main application domains. The research results have been field-tested in collaboration with industry; one of such applications eventually led to founding the Sustainable Buildings company that applies the optimization algorithms in practice. ▪

Ana Bosnic (room 330)
Cognitive Modelling

My research at the AI department involves Language and Linguistics, and it is part of a Cognitive Modelling research group. It is a double degree project with the Linguistics department of the University of Nantes in France. The project is focused on quantification and interpretation of distributive markers across languages. We are investigating how and why children's interpretations differ from adults in Dutch and Serbian, what is the range of interpretations of distributive markers in Serbian and Korean and how this can be explained using experimental methods of psycholinguistics and statistical modelling, together with formal aspects of theoretical linguistics. ▪

Jorge Perez (room 558)
Fundamental Computing

Modern life depends on communication-based software systems; think, for instance, of everyday services such as whatsapp and payment platforms such as IDEAL. At the heart of these systems, we find *message-passing programs* that implement complex protocols. How can we ensure that these programs always respect their intended protocols?

I tackle this challenge by studying *type systems*: a class of verification techniques for message-passing programs, which can quickly detect bugs and errors. My passion is understanding the mathematical foundations of type systems for message-passing programs. This is essential to transfer those foundations to programming languages such as Scala, Haskell, and Go. ▪

Gerben Hettinga (room 491)
Scientific Visualization & Computer Graphics

In my research I look for and investigate innovative ways to vectorise images. Vectorisation is the process of converting a digital image, a raster format where each pixel is assigned a colour, into a vector graphics representation, where an image is represented using different primitives, like curves, colour gradients and meshes. The vectorisation problem lies at the crossroads of image processing and computer graphics and possibly even machine learning. There is much need for vectorisation, as vector graphics are scalable and can be rendered at any resolution, thus being very useful for media that has to be printed at various sizes. ▪

Davide Grossi (room 351)
Multi-Agent Systems

My research focuses on the question: "how do different autonomous (human or artificial) entities take decisions as groups?" Instances of processes of this type are elections, referenda, deliberative committees and assemblies, information markets, consensus protocols (as in distributed ledgers or blockchains) and the like. I am a theoretician and am most interested in the modelling and analysis of such processes (e.g., using tools from logic, where my background is, game and social choice theory, network theory). I especially enjoy interdisciplinary research, and love to build (or at least try to build) bridges across disciplinary "silos". ▪

Maruf Dhali (room 345)
Autonomous Perceptive Systems

The Dead Sea Scrolls project addresses the computational intelligence (digital palaeography) part of a multidisciplinary project on the famous Dead Sea Scrolls, a collection of ancient handwritten manuscripts. In order to identify the writers and to align temporal developments in script style for these manuscripts, we use state-of-the-art techniques in pattern recognition and machine learning; including convolutional and recurrent neural networks. We analyse hand-writings on both the papyri and parchments to find useful attributes. Along with different tools, a secure software environment with High-performance-computing (HPC) ability is utilized using the cutting-edge methods within the Monk system (designed in-house by prof. dr. Schomaker's research group). ▪

Nicola Strisciuglio (room 582)
Intelligent Systems

My research concerns theoretical and applicative aspects of Intelligent systems, with particular attention to computer vision and sound processing. I research the development of AI and pattern recognition tools based on neurophysiological models of the human visual and auditory systems that explain how we process sensed information.

I'm involved in a project about gardening robotics, where we are prototyping the first outdoor gardening robot. In this context, I apply the approaches that I develop to problems of computer vision and robotics in garden environments. ▪

Raffaella Carloni (room 356)
Robotics

The Robotics group, directed by Prof. Raffaella Carloni, is a newly established research group (since September 2017) within our institute. The Robotics group develops systems that are intended to physically interact with uncertain dynamic environments and to cooperate with humans. The group's main focus is the development of novel actuation systems, which are the key enabling components for motion generation. The work is accomplished by developing unique mechanical designs and intelligent control architectures.

Current research projects focus on lower-limb prosthetic devices and on a new generation of bio-inspired artificial muscle. ▪

Stefan Huijser (room 318)
Cognitive Modelling

When we perform activities such as writing up a project or listening to a lecture, we almost always wander off from time to time to engender thoughts about other things such as our current concerns or future plans. In my research, I am interested in understanding the conditions in which these thoughts (called 'self-generated thought') arise, how the thought-processes work, and what the potential function might be. To this end, I combine strengths from experimental research and computational cognitive modelling. Modelling is an important element of my research, because it provides a tool to really understand what is going in the minds of my participants. ▪

Vasilios Andrikopoulos (room 588)
Software Engineering & Architecture

I am interested in the engineering and architectural aspects of large scale distributed software systems. In practice, this means that I am primarily working on a number of cloud computing-related directions, including but not limited to supporting the migration of existing systems to the cloud, and to engineering applications specifically for the cloud. Other areas of interest include blockchain and other distributed ledgers, and systems of systems. A key aspect of my work is the management of operational expenses created by software and the trade-offs required to justify its continuous development and maintenance. ▪

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Be part of progress

Cover goes abroad

During study trips organised by Cover, many participating students get extremely excited by the visited companies and universities. Some of them get so inspired that they decide to apply for a study programme and return to pursue an international career. Two students who joined Covers latest trips to Edinburgh (2016) and the USA (2017) wanted to share their experiences. These are the stories of Julia Mol and Annet Onnes.

Julia Mol

Annet Onnes

Julia: Being part of an international-oriented family has made me fascinated in pursuing an international career quite early. Since I turned eleven, I have had bilingual (English) education, and from that moment in time, I have been interested in studying abroad. One of the main reasons I signed up for the MxCee trip was that we would be visiting multinational companies and universities in the San Francisco Bay Area. About Stanford University in particular, I was already highly excited. Outside the trip's program set by the committee, we got plenty of spare time to spend in the city. Together with my friend Jelle, I topped off my incredible stay in San Francisco with a return to Stanford University Campus. I had the impression that, located as it is in the heart of Silicon Valley, the Mecca of the tech-industry, Stanford's entrepreneurial environment must have an additional motivational impact on its students. Stanford's dynamic, community-oriented campus atmosphere truly inspired me and provided me with an energy boost on the spot. I left the campus convinced that I wanted to return there in the near future. And I will! I got admitted and will attend Stanford Summer Session in June.

Annet: At the start of 2016 I started looking into what I want to do for my master. In the end I stumbled upon the master Mind, Language and Embodied Cognition at the University of Edinburgh.
Conveniently the ExCee of that year had decided to organise an excursion to Edinburgh in April. Twenty Cover members could come on this trip and I was lucky to be among them. During our stay we visited several companies and explored the area.
Most important to me, we visited the university and meet up with students from the computing science society, CompSoc. I had also contacted some people at the university myself and managed to arrange two meetings, with a current student and with the acting program director.
All in all I got a clear picture of what the University of Edinburgh is like: a welcoming community of people who deeply care about their subjects. I felt like everyone was simply excited to work on interesting science! During the ten days I spend there during the ExCee trip, I started to be able to imagine myself calling Edinburgh home. As of now, I am a conditional offer holder, so next year I most likely will!

Julia at Stanford

Annet in Edinburgh

Whisky with Wilkinson

Michael started studying Astronomy in Groningen but got tired with it after a while. He did take a course on computer image analysis that sparked his interest and inspired him to apply for a job on systems for computer vision at the UMCG, which also familiarised him with mathematical morphology. After this, he started his own company for freelance programming jobs, but eventually decided to go back into science.

He finished his Astronomy degree and started his PhD by taking his already published work to Nikolai Petkov, asking him: “Can I graduate on this if I add these things?”. Eventually, he was asked to join a project about diatom analysis, which got him back into mathematical morphology. After this project he became an associate professor, and the rest is history.

Michael Wilkinson, senior lecturer at Computing Science, is also a whisky connoisseur. In order to get to know him better, we invited him to have a nice talk and several glasses of alcoholic beverage with us.

René Mellema

Can you tell us something about your student life?
During my student years, I was a member of the theatre association Spumatores Scenarium (Spuma). I did give theatre training there, but I only actually acted in small improvised pieces for the other members. Mostly, I was a stage technician and I did PR. Afterwards, when I was no longer a student, we created a small theatre association called Feniks de Bastaard. With Feniks de Bastaard I also started to act.

You are known as the man with the telescope in front of the Bernoulliborg. How did that come to be?
I grew up during the Apollo era. My heroes were astronauts, and I successfully begged my parents to let me see the landing on the moon. When I got to high school, there was an eclipse during German lessons for the parallel class. So the other class asked their, rather strict, German teacher if they could see it, and he replied yes, since he was the former honorary chairman of the astronomy club. He told them there was a telescope on the premises, and they asked me if I wanted to help resurrect the astronomy club. So we did. Thanks to the club I also started building my own telescopes. Then, when I studied Astronomy - ironically - I spent less time on stargazing. Astronomy as a job is different from astronomy as a hobby.

Your academic work focuses on image recogintion, a topic that has attracted a lot of attention with new innovations recently. Do you ever think science focuses too much on popular techniques?
There is always some sort of hype cycle. You should not disregard something because it is new, and hypes start for a reason. But you should keep in mind that if you study the same thing that everybody else studies, it is harder to stand out. For conferences, I have reviewed a lot of papers, including papers on neural networks. Some of those are interesting and I learned something new from them. But others just take a different dataset, tweak some numbers and get a slightly better result. Too many even report the new and old performance without error margins. That doesn't tell us anything!

Would you want to go to space?
Yes and no. It depends. I'm fit enough, but you are taking a risk. I would have to think about it. I still remember that when my youngest son was just born, I got an invite from a colleague from Israel to go to a conference in Heifa. That was just after the Second Intifada[1] had started. Heifa was still safe. If it was just me, I would have gone there, but I also had to take care of my kids. So I didn't go. If I'm 80 and I get the chance to go into space, then I *will* go into space. If not then, when else?

> "in a way, looking through a telescope is also a trip through space

But in a way, looking through a telescope is also a trip through space. A larger telescope on a nice dark spot allows you to look back very far into the past. With my telescope I saw an object called OJ 287, a blazar. The best estimate for the distance to that object is 3.5 billion lightyear. That little speck of light took three quarters of the lifetime of the Earth to get here. Now that is just crazy.

What are your go-to whiskies?
The Talisker Port Ruighe. Several whiskies by Glenmorangie, several others by Talisker. From time to time Lagavulin and the Scapa, although for that one I prefer the previous 14 year old. Several Ardbegs. It is nice to alternate a bit. Of the whiskies we had tonight (*Edradour SFTC 13y, Auchentoshan, Glenfiddich 15y, Balvenie 12y, Glenmorangie – Ed.*) I really liked the Auchentoszhan and the Glenmorangie we had. I consider buying those.

1 The Second Intifada was a Palestinian uprising against Israel.

Studio Ghibli: Not “the Japanese Disney”

As a grown-up[1] animation lover, I sometimes feel the need to share my geeky enthusiasm. Unfortunately for me, though, there is a pretty strong stereotype in the way: animated films are often supposed to be “just for kids”. Well, I probably don’t have to say it, but the genre has a lot to offer. From singing along with The Lion King’s “Hakuna Matata”[2] to laughing at Po’s stair struggles in Kung Fu Panda, and from the quirky gloom of Corpse Bride to the hopelessness of Grave of the Fireflies: some films are mostly for kids, others are mostly for adults, but many others can be appreciated by both. And clearly, not all animation studios are alike in this respect.

In the West, the animation scene is dominated by the big D's - Disney (Pixar) and DreamWorks. As much as I like their films, these studios do very little to reduce the stereotype. Sure, there are the famous "grown-up jokes", meant to entertain supervising parents, and sure, Disney occasionally tackles some societally relevant issue.[3] But it's always 100% kid-friendly entertainment.

Admittedly, Disney's films have changed over the years. Once there were Pinocchio, Alice in Wonderland, and Bambi with its menacing humans - films that were as dark as they were charming. Then in the late 60s, the films become less inventive and more customer-centered, which worked well at first. But then reviews and revenue started to suffer. Forced to try something new, the animation giant introduced their new slick musical format in 1989's The Little Mermaid, and it was an instant hit. So... they copied it all throughout the 90s. Which, to be honest, is not necessarily a bad thing. A lot of the films they made during this so-called "renaissance" are quite decent.[4] And though I do think that Disney has missed a lot of opportunities for creativity since the death of the Great Walt Himself,[5] I don't really blame them for being capitalists.

Now, consider Studio Ghibli. While Disney has achieved enormous success in the West by producing animated blockbusters full of talking animals and vibrant colours, Ghibli has been doing the same thing in Japan. It should come as no surprise, then, that 1) Disney has long been responsible for Ghibli's distribution in the West and 2) Ghibli has even been called "the Japanese Disney". But that nickname is not really accurate.

After all, Japan is the land of anime, where animation is ubiquitous and where it can be aimed at any age group. So, first, don't expect all Ghibli's films to be equally kiddie-friendly. For example, blood, rarely seen in a Disney film, flows freely in Princess Mononoke.[6] And The Wind Rises is a straight-up biography about a plane designer - not really what I'd recommend for a fun birthday party. Second, even the films which can be marketed for younger kids usually have a level of storytelling that Disney has, for ages, not even aspired to.[7]

Take Howl's Moving Castle, generally a fun fairy-tale, which has a serious anti-war motive going on. And last but certainly not least, there's the artistic dimension: almost every Ghibli film has a rich, atmospheric soundtrack, a captivating and patiently told storyline, and beautiful artwork - most of which is still hand-drawn.[8] Ghibli takes its time, both in producing a film and in presenting it.

By contrast, Disney films are often fast-paced, full of easy sing-alongs and comic relief. Again, this is not necessarily a bad thing; Disney just provides a different experience than Ghibli. And this feels like it is connected to a different approach to film-making. Roughly, it seems to me that, as long as Ghibli produces films, people will love them; and as long as people love films, Disney will produce them.

> "as long as Ghibli produces films, people will love them; and as long as people love films, Disney will produce them

So while there are definitely similarities between Disney and Ghibli, I think it's a bit crude to call Ghibli "the Japanese Disney". Not only because Ghibli's style is very different from Disney's, in relevant aspects, but also because comparing every animation studio to Disney helps perpetuate the stereotype that all animation is only meant for kids.

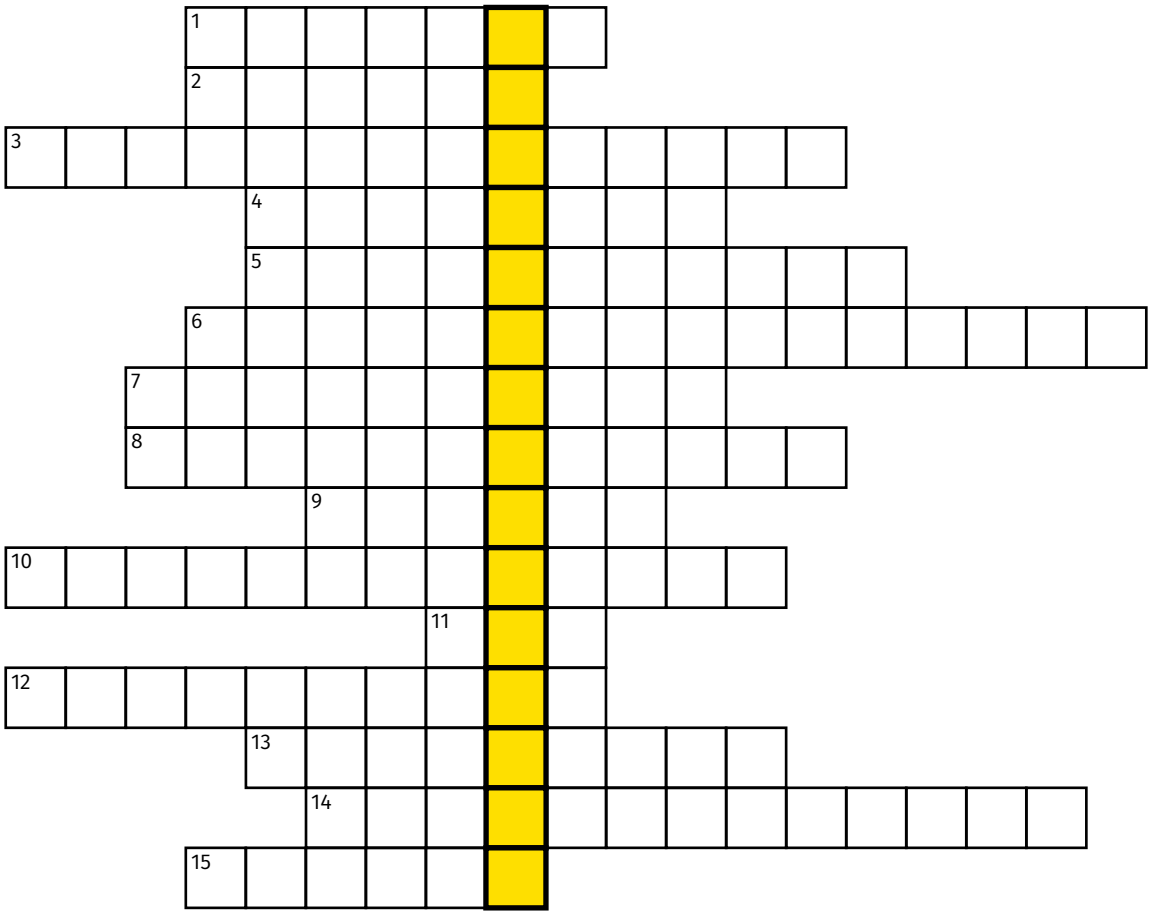
Jan van Houten

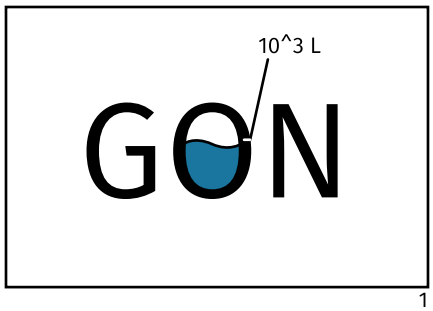
1 More or less.
2 By the way, did you know The Lion King 2 features some pretty great songs as well?
3 A clear example is Zootopia (which is fun! Go watch it!).
4 Though some of those decent films have some appalling comic relief (e.g. The Hunchback of the Notre Dame).
5 Disney's not the only company to suffer this fate.
6 Which, by the way, is an epic film with a serious message. Oh, and it also features some severed limbs and demonic possession. Go watch it.
7 Except with the occasional help of Pixar (the Up scene showing Carl and Ellie through the years is brilliant!).
8 Very few people seem to be in on The Secret World of Arrietty, but I particularly recommend it for all those reasons. Go watch it!

SCI-FI SUMMER PUZZLE

The doctor woke up early to the sound of bulldozers. They were demolishing a house across the street, making space for some futuristic monstrosity.
He'd been chased by assassins all night. The dream wasn't alien to him; he'd had it a few nights in a row, and hoped – against better judgement – that it wouldn't be back.
The doctor took his red and blue pills, which should adjust his mood to a calm serenity. As soon as they kicked in, he called his secretary.
Fifteen minutes later, Caroline materialized in his doorway. She'd been in a hurry and had only put on the most basic makeup.
"Good morning, doctor. Have you decided on a topic for the puzzle yet?"
"Not yet." The deadline was close, and he knew it.
"Hmm. Will you still try to finish it in time?"
"There is no 'try'. I'll do it, and I'll work all night if I have to. After all, the needs of the many outweigh the needs of the few." The doctor sighed. "Or the one. I just wish I could go back in time and start earlier."
"Well, do take some time to relax. You're a doctor, not a miracle worker. Maybe have some cake…"
"I'm sorry, Caroline. I'm afraid I can't do that. The deadline is very soon. And besides, there is no cake."
But a thought had taken off in the doctor's head and was now working its way through his brain at top speed. With renewed energy, he shot up the stairs and into his study.
He stayed there all day, but every time Caroline popped up to bring him coffee, she found him playing some old video game or watching sports on his laptop. She shook her head, expecting the worst.

It was late that night when the doctor finished. The last thing he did was typing out the final line to his puzzle's introduction:
When going to space, never forget…





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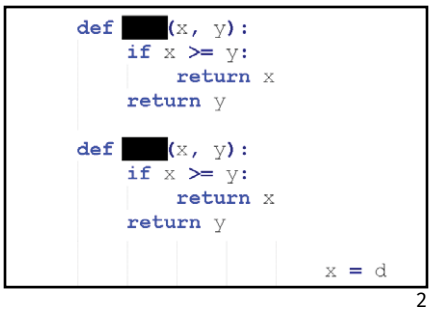

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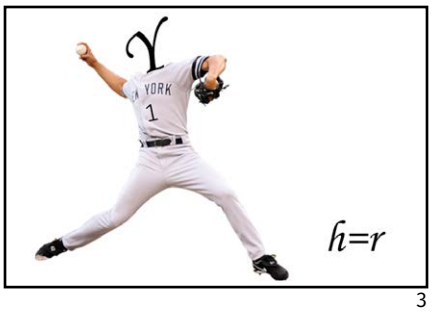

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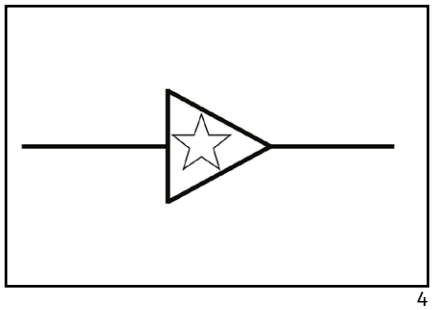
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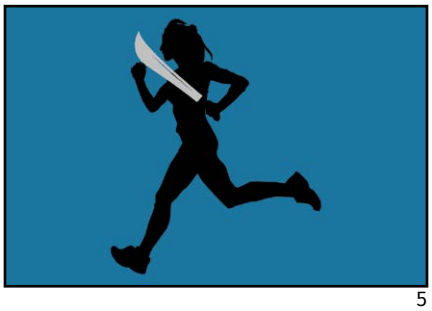
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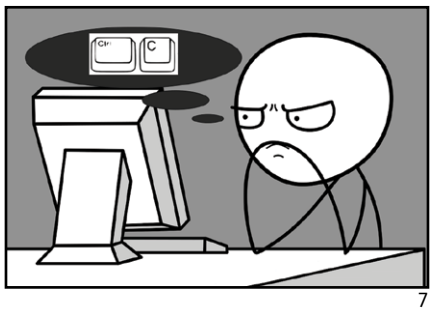

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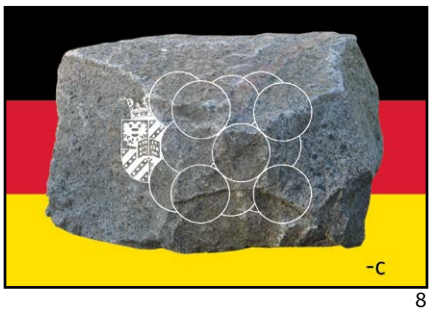

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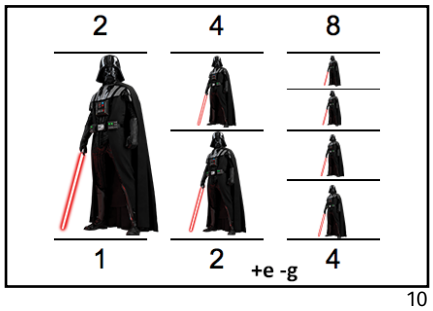

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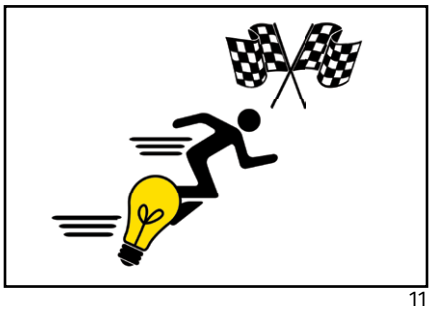
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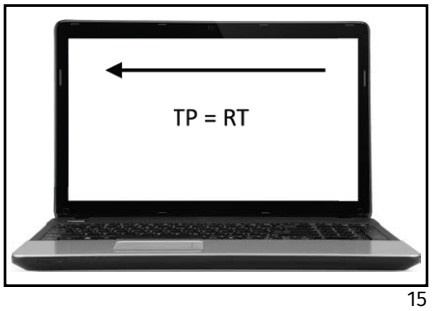

15

This puzzle is based on the Dagblad van het Noorden's annual Dr. Denker Kerstpuzzel. It consists of fifteen mini-rebuses, all of which have something to do with science fiction. Fill in the solutions in the corresponding lines (ignoring spaces) and you'll read, in the yellow column, what you absolutely shouldn't forget to bring when space-travelling.

Feel free to send in the solution to magazine@svcover.nl once you've found it!

Jan van Houten

THE MOST ORGANISED MESS

A meeting with the StudCee

Cover currently counts a total of 23 committees. Every single one of these is filled with members of the association that want to play an active part in upholding all activities as well as day-to-day business that Cover takes care of. One of these committees is the StudCee, which, as the name might suggests, provides study support. This is done not only with the study support lectures we all know, but also by maintaining the tutoring system CACTuS and their site which hosts summaries and old exams. To take care of all of this, the StudCee usually meets once a week, and every other week this said meeting is for social purpose whereas the other is to discuss their formal obligations. I had the opportunity to join one of these latter sessions and experience what the StudCee was all about.

The evening started off in a relaxed fashion as some members prepared dinner while others were playing some Super Smash Bros. When the dinner was ready, I started learning about the many StudCee traditions. Two examples of these would be failing at making pizza (trust me, I've seen the pictures to prove it), and the infamous Pinky Swirly, which is the pink whipped cream that has decorated many extravagant birthday cakes since the day of its discovery by the StudCee. When the dinner concluded, the constant playful back and forth discussion about everything and nothing gradually started to move towards the actual meeting that was to take place after dinner.

As the meeting took place during an exam period, points on the agenda included preparing and reviewing study support sessions. Other points of business were updating the tutoring system and evaluating some ideas proposed by externals. This was not just a regular StudCee meeting however, as the potential locations of the StudCee Week were also to be discussed. During this week in the summer holidays, old as well as current members of the committee are welcome to join for relaxed fun, D&D and all other StudCee madness. What was awesome to see was how involved old committee members still are with the new committee. For example, an old StudCee member, Rafael, currently living in his home country Austria, joined for this part of the meeting over Skype. With all their inside jokes and connected members the committee really is a close group of friends. Nevertheless, it was striking how efficient the StudCee operates. The discussions were productive and respectful, and the division of tasks went smoothly as every single member took initiative and responsibility to help. This teamwork, together with the fact that they also ask for outside help of students and staff in return for one of their many uniquely designed mugs, ensured that their workload stays perfectly doable.

All things considered, the StudCee wholeheartedly accepted their title The Most Organized Mess. Their energetic (albeit somewhat chaotic) approach towards their more serious tasks is impressive, and the fact that they manage to keep the fun in the group while doing this maybe even more so. I think I speak for myself as well as many other active Cover members when I say that the combination between having fun together and getting important things done is what makes joining a committee so satisfying. A committee really is a work hard, play hard happening in which you can develop yourself and that in the end keeps our association alive and kicking.

Barbera de Mol

This Time

this time — agitated as
he glanced over his shoulder
at the end of the corridor
where they were going to
do

it was a lime not
to mention the home comforts
they had enjoyed flatly
been watching him anxiously from
beside the cooker
the door of the brain room
behind them and turned
to face the room

NEXT UP! A NEW DISCOVER?

Next year, the editorial staff of the DisCover will have graduated. We had a lot of fun working on this project, and hope that someone will continue it next year. If you are interested in making the DisCover for next year, approach the new board :)

This poem has been created with the Voicebox app on botnik.org. The background is generated by tweegeemee, a genetic algorithm trained by Twitter users to generate images.

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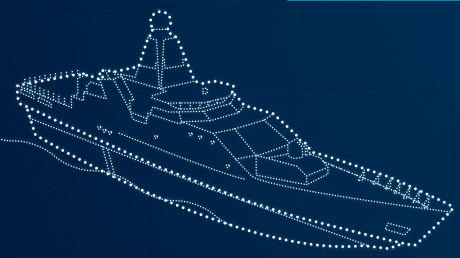

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