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Volume 21 - Issue 1
November 2016

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Irene Vooijs

The start of this academic year is already a few weeks ago: The freshmen are no longer getting lost while searching for the right lecture hall; The first activities have already taken place and right now you are reading the first MaCHazine issue of this year!

The beginning of the year brings new students, a new board and renewed intentions to go to every single lecture, even if it starts at 8.45 in the morning. For me, this semester is completely new, because I no longer study at EEMCS, but follow a minor at the faculty of Civil Engineering. While walking around in this building, I remembered my first year in Delft: I don't know where the lecture halls are yet (and unfortunately they are not as easy to find as the lecture halls at EEMCS). Furthermore, I'm surrounded by new fellow students and even the way of teaching is new to me. This minor mainly exists of excursions to and projects about waterworks, with only a few written exams. Nonetheless, there is enough reason for me to spend time at 'my own' faculty every once in a while, since this year 'Christiaan Huygens' will be celebrating the 12th lustrum of W.I.S.V. 'Chirstiaan Huygens'! This means that, besides all awesome regular activities, there will also be lustrum weeks and a lustrum white tie gala, on which you can read more in this issue of the MaCHazine. The Pre-Lustrum Cantus was already a great success and bodes well for the other activities!

Even the summer was full of CH activities. First of all, this academic year was preceded with a study visit to Brazil. Thirty students were lucky enough to participate in this big event that only takes place once every three years. What's more, the annual freshmen weekend was held during the summer. This year's "weekend" was actually a midweek, but this didn't mean it was less fun. For the students with a double bachelor programme it even had an advantage, since they didn't have to choose which freshmen weekend to go to. My summer mostly consisted of preparing and writing the OWee Courant, of which four editions are released during the Introduction Week. Because of this I was fortunate enough to visit about five other freshmen weekends. However, it was a pity that we could not make it to the CH freshmen weekend. I may be a bit biased, but I think ours is among the most fun weekends of all of them.

Now the weekend is way behind us and even the freshmen reunion has been held already. But before the reunion took place, the year officially started with the switch of the board and the following 'constitutie borrel'. While writing this, the trip to Amsterdam to meet Netflix's CEO Reed Hastings is still fresh in my memory. CH was invited to participate as an audience in an episode of College Tour with Hastings, which was recorded in Paradiso. Remarkable was that he interrupted his holiday in Amsterdam with his family for this interview, but he was eager to answer everyone's questions.

For now, I'm reminding myself to buy a ticket for IFF, a party not only for CH members, but where we will join four other student associations at a party in Lorre. Last year, IFF was a lot of fun, so I have high expectations for this party! And of course I also have to focus on my study, because the first exams and deadlines are coming closer. If you have any questions or suggestions for MaCHazine, I encourage you to send a mail to machazine@ch.tudelft.nl. We're always glad to receive input of our readers. I will no longer keep you from reading the rest of this issue, enjoy!

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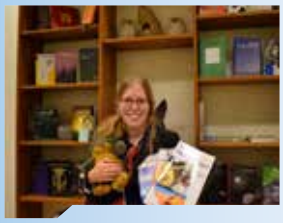

MAGAZINE

From the Board

Marjolein Bouwmeester

'In the blink of an eye' and 'time flies'... I thought I knew what those terms meant, but since my year as a member of the Board of W.I.S.V. 'Christiaan Huygens' started, the terms got a whole new definition for me. A week doesn't feel like 7 days anymore, a day not like 24 hours and an hour not like 60 minutes. Time seems to go at least five times as fast. In a positive way, though.

What felt like ages ago, but is actually only a couple of months back, was when I was a part of the MaCHazine committee myself, spellchecking the article 'From the Board', for example. And here I am now, writing it. Maybe not at the best spot to write, but on the other hand; some members chilling around getting coffee, some working hard on the computers next to my desk. There is also Beer who is sitting next to me, shaking his head on the beat of the music from his headphones, while writing e-mails. Maikel has put on some relaxing music, which makes him my favourite DJ (fortunately for me, he is the one to be in charge of the music system in CH). Nelleke's phone is constantly ringing 'cause companies and the other members of the DDBoard need her help. Karim has his 'do not disturb'-cap on and seems extremely focused, while typing a lot of numbers I don't understand that well. And Thomas and Iris, our so called 'CO'tjes' (Dutch abbreviation for our Chief Commissioners of Education) are on a tour through EEMCS, visiting professors. Quite some inspiration to write an article!

Five weeks have passed since the start of the year and I don't know where to start summarizing those five weeks. So let's just start from the beginning, or maybe even a little further back in time. The first time we may call ourselves 'the Board' was at this year's freshmen weekend. Shining in our black and red blouses with wood printed vests, singing: "Weet je waar ik van hout? Hakken!". WIEWIE and Wocky! made sure the weekend, which was actually Monday-Tuesday-Wednesday, went by flawlessly. This made it possible for us to have all the time we needed to get to know all the new faces. And there were a lot! All of them were learning about our association and its committees and traditions for the first time. Also seeing their study mates for the first time, some people you might be ending up with as friends forever. And there were even more 'firsts' these days: drinking beer with a whole banana in your mouth, getting turned upside down (including matrass) while sleeping, blind soccer, eating the fullest wrap of your life and dancing all night in a basement in Brabant. This is only a small selection of all the great things we have seen during those days and after the Freshmen weekend reunion, I think we can take a final conclusion: Everyone had a great time!

On the fifth of September, it was time for the real deal. There we were, the seven members of 'EPA 60'; The possible potential coming Board 60. All really excited, but also a bit nervous. It was the first day of college for our students, and we were hoping it was the first day for us as a Board. What is going to happen? The General Assembly started with Board 59. They reported about their year: secretarial, educational and financial. They all gave a speech telling us what they've been through, what has happened and some funny, but also sweet, stories about each other. And, although we were waiting for it all day, suddenly we were behind the table. After presenting our policy and plans for the upcoming year, beating the other boards in the competition, saying goodbye to Board 59 as an active Board, now it was our time. However, we took place behind the table for only a short amount of time, because we had to leave: it was time for our constitution drink! Friends and family, members and honorary members, the dean, other associations and staff from the University came by to have a drink with us and tell some stories. The evening ended with a dinner with honorary members and the dean, who all made fun of my red hair, which matched a little too good with the curtains.

The next day started as a cleaning day, CH was looking like a mix of garden and jungle. Cleaning with loud music on, and the weird feeling that that mess, was our mess. I'm not joking, I think already a quarter of my wardrobe is lying around at CH.

After that day, time really started to accelerate, in the way I said before. The first T.U.E.S.Day lunch lecture from our honorary member professor Rothkrantz, College Tour, Committee Interest Lunch, the Career College Kick Off, the second lunch lecture from Thomas Abeel about simulating the evaluation of bacteria, Delft Algortihm Programming Contest, members lunch, the Interfaculty Party, the Career College about Networking, LvV drink, the first week of midterms and we are now in our first lustrumweek!

Quite a list and there is even so much more to come! Keep an eye at our agenda; all the activities to come and give some extra attention to all the festive events for our lustrum. It will be a well filled, awesome year! I hope to see you during our activities, or just for a cup of coffee in our room. Let's make this Lustrum year unforgettable!

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Current Affairs

TU Delft news

Stijn Ruiter

Delft University of Technology is the biggest and oldest Dutch publicly available technical university, established by King Willem II on January 8th, 1842. But what is currently happening on and around the University? In this article, we will list the most recent important events of the in short.

THE ranking

September 2016, the Times Higher Education (THE) published a new university subject ranking, where the best 100 universities in the world are listed regarding certain subjects. Approximately 980 universities were considered, where the Delft University of Technology rose in 3 subject lists.
In the Engineering & Technology ranking, Delft was placed on a 20th place, in comparison to a 19th place last year. The Physical Sciences rose from a 74th to a 58th place. In the Computer Sciences ranking, Delft University of Technology entered the list on a 35th place.
In the general ranking, the university achieved the 59th place.

Interacting particles

Yet again, we are one step closer to a real functioning quantum computer. A team of physicist from Delft University of Technology achieved a way of interacting between q-bits at a relative big distance. It was already possible for scientist to let q-bits, the bits of a quantum computer, interact when they are next to each other. However, at a large distance this wasn't possible until today.
Inside these q-bits, there are electrons with a spin-up or down, which can represent a "0" or "1". They used empty q-bits to create a bridge between the regular q-bits in such a way that data could eventually be sent between them. Unfortunately, the realization of a quantum computer is still miles away, but this is a big step towards creating one.

EWI at hackathon

The EEMCS team of the Computer Engineering Lab won the second place and a price of $25000 in the Big Data Apache Spark hackathon. The team, consisting of Hamid Mushtaq, Hani Alers and Said Al-Ars worked on a framework for high performance and low cost computation of DNA analysis programs using big data technology.
DoctorSpark is an application built in Scala, which uses the big data resources and knowledge available and implements this to drastically decrease the computation time. It is also applicable on existing genomics DNA programs. It is now possible to process a realistic DNA dataset of various gigabytes in less than a hour.

Wireless Ecocharger

Some of you might have seen it already and wondered what it is supposed to be. Next to the freezone near EEMCS, the dean, Tim van der Hagen, presented an experimental wireless charging station for electrical bicycles. This station is the first of its kind, because it is charged using solar panels.
The experimental wireless bike can be charged by using the magnetic tiles at the station. The bike will automatically be charged using a coil, which will not take longer than regular charging. It also has a few spaces for regular electrical bikes to charge. Not only is this a method to get the campus more green, but it also contributed to the 'Living Lab', an environment for experiments where several students have already finished a product, including EEMCS students.

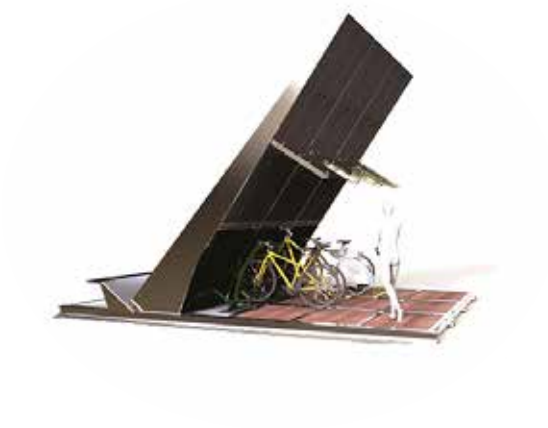

Figure 1: The wireless e-bike charger

Dreamteams

While some people went to South Africa for a vacation in the sun, the Nuon Solar Team raced through South Africa this summer. In the SASOL Solar Challenge, the Nuna8s won the race of a distance of 4717 kilometers with a distance of 173 kilometers between it and the second fastest contestant.
Not only did they win the race with this distance, but they also broke the record for largest travelled distance in a single Solar Challenge.

Another dreamteam that achieved results this summer was the Human Power Team of Delft and VU Amsterdam. They were the third team in this year's speed challenge in the Nevada desert, US. With a top speed of 124,75 km/h they came just short to beat the new world record of 144,15 km/h, achieved by the Canadian Todd Reichert.

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Educators need education

Fred Vermolen

Nowadays society is demanding more and more certification. Next to educated, academic people, society also wants the lecturers at the Delft University to be certified. Is this a good thing?

Today's society is getting more and more complicated and therefore it is not strange that people need to be higher educated. School attendance has increased tremendously over the past decades and centuries. In general, this increase in level of education is good thing since by educating people well, we hope to get smarter people who will be able to come up with new ideas and with new, original solutions. This increase in creativity could improve (however, it does not always improve society) our quality of life, as well as increase our life expectancy. It does not take a rocket scientist to see that in order to reach this goal we need to have good educators. These educators are crucially important at all stages of education of the next generations, starting at elementary school until academia or at craft schools. Since we are at the Delft University, I limit this piece to academia.

In order to facilitate good teaching, classrooms need to be suitable for the transmission of information with modern presentation facilities, as well as with good, large and readable blackboards if necessary. I will return to this issue later. Next to excellent facilities, it is important to have motivated teachers who enthusiastically share their knowledge with the students. The students should be offered all the facilities to pass the course as well as possible and it is nice if most of the students enjoy the course and more importantly, the students should appreciate the added value of the course and they should have learned something useful. All the courses should also comply to international standards. These aspects imply that the lecturers should satisfy certain standards as well. They should master their course material well and be able to transfer their information well both orally and in text.

To increase the quality of the lecturers at the Dutch universities, the lecturers are sent to teaching courses and they have to complete an educational programme. The educational programme includes writing a report about several topics that are encountered during teaching. To mention some examples of topics, we list cultural aspects in student populations, dealing with students who violate deadlines and dealing with noisy students. The report is evaluated by several colleagues from different departments from the faculty of the lecturer, and by the lecturer's course coordinator. All lecturers at the Delft University have to go through this programme. In fact, it is my own opinion that offering lecturing courses to lecturers is not a bad thing, in particular if the attendees are supplied with descent amounts of beer and other alcoholic beverages. All teachers at primary and secondary schools followed teaching courses next to the courses about the material they are teaching. At some secondary schools, teaching is a real challenge, and here I am not referring to the secondary schools that were attended by most of the students here. I really admire the teachers at secondary schools. They are doing a great job. When academic lecturers are hired, then teaching qualities are valued and important, however, they start teaching without having followed any course in teaching. This is amazing. However, nowadays teachers follow an education programme, which is referred to as the BKO (Basis Kwalificatie Onderwijs = Basic Qualification Education).

Hence it is a good thing that the university tries to increase the skill of its lecturers. In particular the lecturers who have difficulty teaching or who just started teaching should be offered teaching courses and other facilities that increase the quality of their teaching efforts. The BKO requires a report from each lecturer on several teaching aspects. I completed this module very quickly when I had to do it. It took me a bit less than six full working day five full days to complete the first version of the report and one day (not a full day) to process the revisions. The reports had to be filled with self-reflections on the teaching activities and this takes a different attitude on writing than on writing a text on mathematics or on technology. It is a way of *femanime* thinking that we hardly have at the Delft University but which characterises the spirit of modern Dutch society (think of elementary and secondary schools and think of how criminals are treated in the Netherlands). Therefore, for many of my colleagues, it took much more time to do it and therefore I doubt whether the present BKO is a good thing. Some very experienced, good and even well skilled (first degree, regarding educational aspects) lecturers had to follow the programme, and furthermore, the BKO is evaluated at the own faculty of the lecturer. Compare this to a butcher who inspects his own meat. It is not surprising that the BKO certification is useless outside the universities. This is a pity, I think. I also think it is a pity that it takes a lot of money (think of salaries of full professors).

So far, we only considered the improvement of the quality of the lecturer, regarding technical support, it seems that more and more blackboards are removed from the classrooms. Most lectures in mathematics require a gradual and slow build-up of the theory. In this sense blackboards are indispensable and therewith the students are denied good educational methods. It clearly shows that this kind of measurements is taken by committees that have no connection with teaching or with students whatsoever. At this moment, I feel that I am starting to get angry again and therefore it is better to relax a little and to start drinking lots of beers (Good idea! Waiter, could I have a large glass of cold beer, please?). To wrap up, it is a good thing that the lecturers are being certified and evaluated, however, the way that it is happening currently could be subject for improvement.

I am sorry that I bored you with all this. I am going to drink lots of beer and other alcoholic beverages right now! Cheers – Skål !

In the future, everyone will be a programmer for 15 minutes

Felienne Hermans

Did you know this is a quote from... 1968[1]? That is before the Internet (1974), the Web (1991) and YouTube (2006). My similar prediction is that in our future, everyone will be a programmer for 15 minutes.

Really, everyone a programmer?

Yes! We are closer than you might think! School teachers used to just teach, but now many are using student tracking systems to analyze performance. Maybe they'd like to see the student that made the most progress in the last 22 days? The info is just 1 query away. And what about a car mechanic? That job used to be all mechanical, but software is playing an increasing role in that field too. There are many examples like that.

The most popular programming tool for 'none programmers' is probably Microsoft Excel. 95% Of all US companies use spreadsheets for financial reporting, and 54% of Dutch citizens can use formulas in spreadsheets, up from 44% just 10 years ago. You might not consider spreadsheets code, but you'd be wrong!

Spreadsheets are code

There are three reasons that spreadsheets can be considered code. Firstly, spreadsheets are used for very similar problems, like financial calculations or data manipulation. In many cases, users have investigated the use of 'off the shelf' solution, however, they are often expensive and do not fit their needs exactly. A second alternative, having software made specifically for their problem tends to go over time and over budget as well. In that light, using spreadsheets seems a cheap and simple solution for many end-users.

Secondly, spreadsheets are Turing complete. And I am not even talking about the Visual Basic code behind them. Using formulas only, you can construct a Turing machine. See my website for the Turing machine and a description of how it works[2]. So never say spreadsheets are not as powerful as any other language!

Finally spreadsheets suffer from typical software problems:

- Long life span: Sometimes, spreadsheets are created for one time use, and they are also thrown away after that use. More often they stay 'alive': enhanced with more data, reused for next year's budget or modified for a different department. In my dissertation I found that spreadsheets have an average lifespan of 5 years[3].
- Many different users: During their lifespan, spreadsheets are frequently shared among coworkers. On average, twelve different people work with one spreadsheet during its life, in many different ways. Shared for data entry, for checking or for analysis.
- Lack of documentation: We found that only one in three spreadsheets contain documentation, and we are not even talking about technical documentation, but just something as basic as a manual on how to use the spreadsheet is one present in one thirds of the spreadsheets we examined.

What tools are needed?

The Internet, The Web and YouTube have helped make Warhol's prediction true. We could wonder what tools would enable to make mine true. This is a field of programming that is commonly called end-user programming. In my research I have worked on several techniques from software engineering that might be useful for end-user programmers too. An example is the concept of "code smells" introduced by Martin Fowler. Code smells are pieces of source code that aren't programmed in the prettiest way. Imagine a 1000 line method ---yes, those happen in practice!---. The method might function perfectly, but maintenance will be hard. Another example is a method with 100 parameters. Which parameter is which is hard to know. These smells are easy to map to spreadsheets, imagine an Excel formula A1+A2+A3+A4...+A100. Not as easy to read as SUM(A1:A100). Smells in source code are common, and in spreadsheets as well. We found that 42% of spreadsheets have smells in them; especially many parameters and long method are very common in spreadsheets.

What's next?

Code smells are just one example of a programming concept that transfers well to end-users.

The fact that there will be so many end-user programmers in the future offers several interesting research directions for the software engineering domain. When the boundaries between professional and end-user developers are blurred, so will be the boundaries between the traditional IDE for professionals and end-user tools such as spreadsheets, LabView or MatLab. Equipping those tools with techniques for testing, measuring and maintaining artifacts will be an exciting new challenge to support everyone to be a programmer, even if just for 15 minutes.

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Faculty Student Council

Saskia Vertregt

The new academic year has started, a new load of freshmen has arrived and EEMCS is crowded again after a quiet summer. While all this is happening, a new Faculty Student Council (FSC) has also started its term, consisting of a new group of members.

What is the FSC?

Some may know what we do, but for those who do not yet know: the FSC or Faculty Student Council is a student representative council within our faculty EEMCS. The council consists of four Electrical Engineering students, four Computer Science students, three Mathematics students and one set of students of both master and bachelor programmes. In practice the FSC will try to improve the faculty on behalf of the students by giving advice and participating in important meetings and discussions within the faculty. An important mean to this end is the FSC-faculty meeting, which is an official meeting between the FSC and the dean, but the Directors of Studies are usually present as well as other possibly relevant guests. Furthermore, the FSC has to approve several official documents. These documents are the Teaching and Exam Regulations of both the bachelor and the master, the education programmes from the Student Charter, the faculty budget and the faculty regulations. Additionally, the FSC has the right to advise and the right of initiative regarding anything relevant to the students of EEMCS. The right to advise entails that the faculty has to ask the FSC for input on certain matters. The right of initiative implies that the FSC is free to discuss and advise on any subject. Last but not least, the FSC of EEMCS also discusses university-wide issues through meetings with all of the FSC's and the Student Council (SC) of the university.

Who is in the FSC?

The FSC of EEMCS for the academic year 2016-2017 consists of the following students:

- In the chamber of Mathematics: Eline Kleimann, Stan Hennekens, Saskia Vertregt;
- In the chamber of Electrical Engineering: Daniel Kappelle, Yikun Chen, Avinash Yadav, Philip van den Heuvel;
- In the chamber of Computer Science: Daan Rennings, Chantal Olieman, Davey Struijk, David Allaart;
- In the chamber of Sustainable Energy Technology: Mario Rodriguez

Looking back

The FSC of last year has focused on the bachelor Computer Science, as the bachelor programme has started to be partially taught in English from this year on. The main concern was the English proficiency of the teaching staff. The FSC made sure that guidelines for checking the English proficiency of both TAs (Teaching Assistants) and lecturing staff were made. After realizing these guidelines, the FSC approved for the transition to an English bachelor for Computer Science.

They also focused on promoting the FSC within the faculty. They did this by introducing the coffee moment. This 'coffee moment' is a small event in the faculty during which the FSC tries to gain as much information from students by asking their input while offering them free coffee near the lecture rooms.

Looking forward

In the upcoming year we will be focusing on a few things we think are important. As we will partially be moving to a new building at the end of this academic year, there is a lot that needs to be taken care of. For instance, we currently have multiple different spaces to study in EEMCS. You can find such places on the ground, first and second floor, but the meeting rooms in the low-rise building are also available for this purpose. We will try to make sure this will also be the case in the new building and during the process of moving so that everyone will have enough possibilities to study at the faculty.

One other point of focus is online education. Every year, more and more students sign up for a degree at the TU Delft. This results in the lecture rooms getting more crowded and places to study at the faculty quickly getting occupied. Therefore, it is sometimes more convenient to study at home. To this end, we would like for more lectures to be on Collegerama (in which we would give a higher priority to the more difficult courses followed by large groups of students). We do have more points of attention for which we still are discussing our policy for the upcoming year. Ask us about it if you're interested! And of course we will also continue to check up on the progress that was made last year, to keep on improving!

We want your input!

Every quarter we will organize a coffee moment to talk to students. Then, you can find us in the hall of EEMCS with free coffee, ready to hear your stories about studying at EEMCS. We would very much like to hear about all problems you encounter throughout the faculty or any ideas you might have for improving the education at EEMCS, big or small. Our first coffee moment has already passed when you're reading this article. But, if you cannot wait for the next coffee moment, you can always send us an email at: fsc@ch.tudelft.nl.

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18 01.2017 — Pub quiz

20 03.2017 — Start Lustrum Week 2

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Association

Freshmen weekend by a freshman

Annemieke Brouwer, Doris Aafjes & Angeline Bosman

Monday August 15th through Wednesday August 17th was the freshmen weekend, all the computer science and math freshmen gathered at EEMCS. We would leave to Someren for an amazing weekend with the board members of the 59th and 60th board of CH, the Facie, the Camera Crew, mentors, Wocky and of course with the WIEWIE who organized this weekend!

The day begun at EEMCS, where we got a T-shirt and our little soul (a booklet). We were told it was very important not to lose it, because you can't live without a soul. With that settled, we started our first lecture, followed by a tour through EEMCS, bottom to top. Then, the WIEWIE put us in our very first matrix, it was a moment we would never forget. In the matrix we learned the most important song of our life: the CH-song! We also learned some anti-songs against other studies. Finally, after we got to know each other a little better, we got our lunch at approximately half past three. After lunch, six busses brought us to the beautiful Someren (yes yes bus 6!!). We were entertained with speed dates with Beer the entire journey.

After arriving at a farm in Someren, we played a game where everyone received a question they had to ask to the others, such as: "Have you ever gone bungee-jumping??" and "What is the meaning of life?".

Then, it was time to pick rooms. The rooms were quite luxurious: with normal beds and if you were lucky even a sink and a mirror (or maybe that was just our room). By the time everything was sorted out we were pretty hungry. Luckily, the Wocky! was already preparing dinner: wraps! After dinner it was time for some more fun. We were divided in groups and played all sorts of different games. For example, one involved drinking with a banana in your mouth, another was blind soccer. After that, the party was on! It took place in the basement of the farm, the Wocky! was already there to pour us some drinks. Everybody danced from the very beginning thanks to the great music of DJ Struikrover and DJio.

After only a few hours of sleep, we woke up with a camera in our face. The WIEWIE was there to threaten to turn the mattresses of the people who didn't get up and the camera crew recorded our sleepy faces.

We started the day with morning gymnastics and yoga. Afterwards, we were starving and it was finally time for br(e)akfast (for the not Dutch speaking readers: brak is hungover). The morning programme contained a variety of sports. Some involved water, which was very nice because of the hot weather.

After the activities, we had some time to relax and prepare ourselves for the long hike we would have to make. We explored Someren and went on a quest to all committees of CH, some teachers and the board, they all told us a bit about what they do themselves and it was a fun way to learn a little about CH. We also learned what we could do for CH in our first year.

When we got back from the three-hour-long hike, the Wocky and mentors had prepared a bbq for us! It was just what we needed after a long and active day. While we were barbecueing, everyone else was preparing for the 'colorful evening'. Different groups performed entertaining acts: the board taught us the song 'hout hakken' (wood cutting), the FaCie taught us how to become a worthy CH sjaarsCH (freshman) and the WIEWIE sang us a song about the difference between a 'nul' (zero) and a WIEWIE'er. To top it all off, the Wocky! showed their rap skills and sang us the great song 'whatsgekookt' (what's for dinner). Then Karim (the treasurer of this year's board) was 'cleaned' with water by the former treasurer, Ruth, after he was smeared with ketchup, mustard and other sauces by some freshmen girls, to start his year as a treasurer with a clean slate. With this the mood was set and it was time for the party to start!

The last day was a very short one. After breakfast, we packed our things, and then formed groups and chose mentors for the OWee (introduction week). Then we left to go back to Delft. In the back of the bus, we bonded with our group and mentors, but some fell asleep and didn't notice a thing. Luckily we had a few days to rest. That Sunday we started an amazing OWee and with these events the start of our student career was set.

Freshmen weekend by a mentor

Ilona Post

Previous to the well-known student introduction week, in Delft known as "de OWee", each study association welcomes their new students by organizing a freshman weekend. The new members, the WIEWIE, Wocky! and all of the mentors gathered at EEMCS for a presentation, a tour and a loud introduction to an important singing tradition in Delft.

During the tour in EEMCS we were allowed to go on to the roof of this large building. We were rewarded with an incredible view over the whole of Delft and we could even see the Hague and Rotterdam from there. Later, for over two hours, the freshmen stood together on a field shouting the new learned songs so they would know them by heart during the opening of the OWee. Dead tired from the overuse of our voices we left with a small lunch to Someren. The drive lasted about two hours and we were enthusiastically entertained by the members of our new board in the mean time.

We were happy to arrive after the long and warm drive. It was late noon now. We started off with a game to get to know each other better, in Dutch we like to use the word 'integrate' for that. Afterwards the Wocky! saved us from starving with a delicious meal, although the cutlery was missing (as always), which led to some gross video recordings. Looking forward to some partying later, we (mentors) had to set up some more games for the night; blind soccer, learning drinking games without alcohol, banana-beer relay race, the integrating game (mathematical), the name game and loads more. It seemed everyone enjoyed themselves and did a great lot of integrating.

When the night fell, everyone changed from their unattractive freshman t-shirts into some more lightly, fancy stuff to go for a dance. Then, the night followed as it does every year over and over again. A lot of dancing, a lot of integrating, a lot of beer, and a lot of people getting to know each other very very well. All of this was recorded, and therefore sometimes interrupted, by our fellow film crew. With their blinding light on top of the camera, they were able to record everything during the night, even when you didn't notice it and really didn't want it to be recorded. The music was very well taken care of by two of the students of CH. Traditionally, the party ended when the last people left for their beds. But after only a few hours we were brutally woken by the WIEWIE for a healthy, bright and energetic start of a new day; morning exercises.

A good breakfast and the sun charged us with some new energy for the most fun, wet and crazy games of the weekend; water baseball, belly sliding, soap soccer and jeu de everything. The weather was perfect again for games like that. After lunch, we were ready for what we call in Dutch "vossenjacht". The freshmen walked through the fields and streets in Someren where they came across some stops to learn some more things about our study association. Together with some of my friends, I guarded one of the posts. Our job was to tell the new freshmen about all the first year committees of CH. It was fun and in the meantime also a good time to rest.

After a few hours we came back to a delicious barbecue the Wocky! had prepared for us and the night continued just like the one before. With even more beer and more people getting to know each other very very well. Because of the perfect weather all weekend, people were enjoying their time outside as well. Some preferred to hang out by the picnic tables, watching the stars until the middle of the night. That night again, we had even less hours of sleep until the WIEWIE woke us. But not for morning exercises now; for some cleaning this time. We had to leave Someren earlier this year and there was still a lot of cleaning to be done. After the cleaning we had a large breakfast and we could chill for an hour or two on the grass while we waited for the buses.

The ride back to Delft seemed to last much shorter, but this was probably because everyone fell asleep within the first few minutes. The weekend was perfect again. I met so many new nice people, got to know others better, and formed a really cool mentor group for the OWee.

Study Visit Brazil

Inoni van Dorp

From the July 4 through July 25, with a group of 30 bachelor and master students and 2 professors (Cor Kraaikamp and Thomas Abeel), we went to Brazil for a study visit. We had the pleasure of spending approximately one week in each of three very different Brazilian cities: São Paulo, Porto Alegre and Rio de Janeiro. In these two pages you can read a short summary of our amazing trip, but if you want to hear more about our adventures you should really ask one of the participants; I believe that everybody would love to tell you more about this amazing trip!

Monday July 4th

It all started very early in the morning of Monday July 4th. Our plane departed around 10 AM and we had a long flight before us. After a long 12-hour journey we arrived at our first hotel in São Paulo, where everybody went to bed quickly after dinner.

Tuesday July 5th

On our first real day in Brazil, we could enjoy some of the culture in São Paulo. The first cultural hotspot of the day was the São Bento monastery. As real tourists we did not blend in quite well, but luckily some of the locals warned us for pickpocketing and how we should really not wear our backpacks on our back.

Next up was the Municipal Market, the local market hall. This led us through one of the most chaotic and busy streets in São Paulo. A new species of mankind was discovered here, recognizable by his distinctive repetitive call "aquaquaquaqua" and bottles of water in their waving hands. In the market, we found a great variety of Brazilian food so everybody could enjoy some lunch.

After lunch we went to one of the skyscrapers where we could enjoy a stunning view over the city. Last stop for the day was the Ibirapuera Park, the biggest park in São Paulo. It was a surprisingly well maintained park where the locals spend their time skating, running, biking and exercising.

Wednesday July 6th

This day we went to the University of São Paulo (USP), where we could enjoy some mathematics and computer science lectures. The USP surprised us by the great math exhibition they had. We also got to meet some of the USP students who told us more about studying in Brazil.

After our visit to USP, we went to the Dutch consulate. They had four main points to tell us about Brazil, namely: Brazil is awesome, Caipirinhas are awesome, there are a lot of collaborations between Holland and Brazil and TU Delft does a lot of things in Brazil. We ended this day with some Caipirinhas at the Skybar, an exclusive bar with a breath taking view over the city.

Thursday July 7th

On Thursday was our first company day. In the morning we went to BlueSoft, a small software company that develops software for i.e. supermarkets. Afterwards we went to the São Paulo zoo, the largest zoo in Brazil with a variety of reptiles, birds, mammals and amphibians.

At the end of the day we went to the neighbourhood Vila Madalena for dinner. This neighbourhood is famous for its nightlife and has a lot of bars and restaurants. The students from USP joined us here for some Caipirinhas.

Friday July 8th

We started the day with some free time, which most of the group used to sleep in after the night in Vila Madelena. In the afternoon we visited the Boston Consulting Group where we could work on an interesting case. This case involved a fictional German company called Pharma Delivery that specialized in transporting pharmaceutical products. The company was facing competition from express companies such as FedEx and the case questioned how they could retain their market share.

Saturday July 9th

This was our last full day in São Paulo. We started with a visit to the Praça Benedito Calixto, a square with a Brazilian antique marketplace. Afterwards everybody had time to explore the last things in São Paulo by themselves, before we had to leave this beautiful city the next day. We celebrated our last night in São Paulo all together with some food at a traditional churrascaria. Besides a delicious buffet, a churrascaria also has waiters that come to your table with all kind of large pieces of meat.

Sunday July 10th

On Sunday we unfortunately had to leave São Paulo for our next destination: Porto Alegre. This day therefore consisted mostly of sitting and waiting. When we arrived in Porto Alegre, the first thing that caught the attention was the weather, which was a bit chillier than we were used to so far. A new city meant a new hotel and after everybody was checked in (and some people discovered the first cockroaches) we went for dinner at an Italian restaurant close by the hotel.

Monday July 11th

We started our time in Porto Alegre with a free day. Most people went to see some of the cultural highlights of Porto Alegre such as Praça da Matriz, the square in front of the Metropolitan Cathedral which features an impressive monument dedicated to Julio Prates de Castilhos –who was the principal author of Brazil's modern constitution. At night we went to the cinema to see 'Finding Dory', which luckily was not dubbed in Portuguese.

Tuesday July 12th

Today we went to the federal university of Porto Alegre: Universidade Federal do Rio Grande do Sul (UFRGS). UFRGS is among the most highly rated Brazilian universities and has over 27,000 undergraduate students and over 9,300 graduate students. The university has more than 2,500 professors and as a public

federal institution, the students do not have to pay tuition fees to enrol in the courses offered by the university. At the end of the day, one of the UFRGS professors joined us for dinner at a churrascaria.

Wednesday July 13th

This day we had again a day off to explore Porto Alegre by ourselves. However, when someone posted the idea of a wine tasting excursion, everyone was so enthusiastic that almost the entire group joined this excursion. The area around Porto Alegre consists of a large wine valley with lots of wineries, where we could enjoy a day full of wine tasting.

Thursday July 14th

On Thursday morning we had some more free time in Porto Alegre. Some people used this time to go to the Science museum, others just slept in. In the afternoon it was time for another company visit. This time we went to ThoughtWorks where we did a workshop about Artificial Intelligence for social security. Afterwards we went to the neighbourhood Cidade Baixa, the best location in Porto Alegre to have some drinks. The whole group went dancing in a club named 'Margot' and a lot of good stories were made here!

Friday July 15th

Everybody felt a little bit hungover this morning, but at 8:45 sharp we went to Estádio Beira-Rio. This arena was inaugurated in 1969 and has a capacity of 51,300 supporters. It is the home of SC Internacional. Next we went to the hop on/hop off bus which led us to all the cultural highlights of Porto Alegre, such as Parque Farroupilha and Parcão, two parks in the city centre.

Saturday July 16th

It was time to say goodbye to Porto Alegre and to continue to our final destination: Rio de Janeiro. Our last hotel was a real joy: nearby Copacabana Beach, with a rooftop swimming pool, fitness room, sauna and of course beautiful rooms and a great breakfast buffet!

Sunday July 17th

On our first full day in Rio there were no mandatory events, so we could explore the best looking city of our trip! Some of the highlights were Lagoa Rodrigo de Freitas, the big lagoon of Rio where you could already see the rowing court for the upcoming Olympic Games and the Botanic Garden. Another part of the group wanted to see a soccer match in Maracanã. Unfortunately, after buying tickets for the match they found out that the match was moved to another stadium. This stadium was in a not so friendly looking neighbourhood and after being called "Gringo" by most of the other supporters, the group made the wise decision to return to Copacabana. Luckily, their taxi drivers managed to sell the tickets to other supporters.

Monday July 18th

This was the day everybody had been looking forward to: a cultural day in Rio. A small train that bravely climbed the steep hills brought us to the statue of Christ the Redeemer, where of course everybody had to take a selfie. After spending some time there and enjoying the wonderful view over Rio, we wdescended for lunch. Afterwards we took a cable car to Sugarloaf Mountain, where we could see the sunset and drink some excellent caipirinhas.

Tuesday July 19th

After two relaxing days it was time for a university visit: Instituto Nacional de Matemática Pura e Aplicada (IMPA), an institute for pure and applied mathematics. Since IMPA is located near the mountain, there were a lot of green and small animals to see. The view from the roof was very impressive as well!

Wednesday July 20th

On Wednesday we went to another university. This time we visited the Pontifical Catholic University of Rio de Janeiro (PUC-Rio). In the afternoon we went to EY, where we attended a presentation about the Olympic Games. As an official supporter of the Rio 2016 Olympic Games, EY provided advisory and internal audit services to the Rio 2016 Organizing Committee.

Thursday July 21st

Today we went for a cruise on the Guanabara Bay. Luckily nobody got see-sick and after two hours of sailing, we ended this tour with another group picture. In the afternoon we continued the program with a visit to MJV Technology & Innovation, where we could see different applications of the work of MJV, such as a simulation of drunk driving.

Friday July 22nd

This was another free day in Rio. Some people went to Santa Teresa, a special and artistic neighbourhood on the top of the Santa Teresa hill. Others went shopping to buy souvenirs such as Havaianas and a small group decided to do a favela tour.

Saturday July 23rd

On Saturday we went on the Pico da Tijuca Hiking Tour. On our way to the hike we made a quick stop at the iconic Maracanã stadium before we arrived at the Tijuca Forest National Park where we started the 5 km trail (700 meter elevation). It took us about 1 hour and 20 minutes to reach the top, but the view was certainly worth the effort.

Sunday July 24th

The last free day before departure was one of the best days in terms of weather we had for the entire study visit, so most of the group spend the day at Copacabana or Ipanema Beach. We ended the day with a special dinner at Churrascaria Palace, the best barbecue restaurant of Rio for a final taste of unlimited meat and buffet. Unfortunately we had to fly back to the Netherlands the next day, at least with amazing memories about this wonderful Study Visit!

Lustrum is finally here!

Felix van Doorn

After a well-deserved summer vacation, the new academic year is slowly, but surely, taking shape. We expect that you feel reinvigorated, because you are going to need a whole lot of extra energy this year. The lustrum year is finally upon us and we've got so much in store for you!

Those of you who have not spent a lot of time at a university in the Netherlands might not have a clue about why we're so exited about this, so allow me to explain. The history of lustra (plural of lustrum) dates back to ancient Rome. Every five years all men in the city would gather for a census and sacrifice a bull, a pig and a sheep to Mars, the god of war, in order to purify the land. This event was called a lustrum, because it occurred every five years and lustrum is simply Latin for a five year period. As happens with many Roman traditions, this one also found its way to the world of western academia. Especially in the Netherlands and Belgium, every fifth anniversary of the university or student/study association is celebrated in an extensive manner. Each of these types of institutions has their own way of celebrating this. None of these have chosen to uphold the ancient Roman traditions of animal sacrifice during a lustrum; Whether this is a pity is all up to you to think about.

W.I.S.V. 'Christiaan Huygens' will be celebrating its 60th anniversary and 12th lustrum this year. Some of our readers might remember our promotional pre-lustrum activities and I would like to assure them we have been doing everything in our power to keep this trend going.

Although we will be organizing all kinds of different activities, the bulk of these are concentrated during the two lustrum weeks. The first of these weeks is from 10th through 14th October, while the second of these starts on the 20th of March and ends on the 24th. We will start off the year by organizing an owl show on campus, which is free and open for everyone. This is of course a fantastic opportunity to witness everyone's favourite animal. After this show we will move back to our faculty building for some short opening presentations by our honorary and acting chairperson and the chairman of the lustrum committee. After all this food for thought, you will be able to get your hands on some actual food. We will be honouring ancient Roman tradition by hosting our very own barbecue.

as his job description on LinkedIn. As a Data Scientist Vincent also evidently has a passion for all trending things.

On Wednesday, we'll be going to 'de Koperen Kat', a brewery in Delft that brews a range of craft beers! Beer is an important part of student life, so you better come along and see how it is actually made. Here we will get a tour of the brewery and get to sample some of the brewery's excellent beers.

On Thursday, it is time for some serious stuff, as our lustrum year is not exclusively filled with parties. We will be visiting Optiver in its Amsterdam headquarters for a workshop! Optiver is a global electronic market maker and a premium partner of our lustrum year. Everyone with an interest in software development, optimisation, algorithms, statistics, game theory or machine learning applied to the area of finance is highly recommended to join.

You won't have to worry that things will become too serious at this point, as we will end the first lustrum week with our 'Friends from the Past'-day! On this day you can invite three of your oldest friends over to Delft to see what student life is like over here. We will start at the faculty of EEMCS so your friends can see where you study. Your friends will also get a short lecture explaining what you actually study and how perfectly awesome it is. Our lecturers for this day are Cynthia Liem and Geurt Jongbloed. Please note that these lectures will be held in Dutch. After the lectures we will move on to the /Pub for beers and pizza, an essential part of the CH experience. We will then go on a pubcrawl through Delft and show your friends through the city.

As this year's lustrum is our association's 12th lustrum, we suggest you keep your eyes peeled for any sudden cool activities we will be organizing on the twelfth day of the twelfth month of the year. It will be a slightly bigger version of last year's 12th of the month promotional stunts.

On the 16th of December the association's lustrum Gala will be held. Although this activity is not organized by the lustrum committee, it is one of the biggest activities of the lustrum year. A night at an awesome location, fancy dress, etiquette, and drinks; Sounds like all the required ingredients for a very special night. Speaking of special, this year's gala is a little different than other years. Normally it is the men who are expected to invite their dates to accompany

them to the Gala. However, as 2016 is a leap year, it is now the women who must do so. Guys, remember that you can still ask a girl out, fortune favors the bold.

After the Christmas break, we will be having a pub quiz in the /Pub together with Alten. Alten is a company specialized in technical consulting and engineering. Employees of the company will join us for a night filled with fun while your general knowledge will be put to the test.

On the 20th of March the time has come for lustrum week 2. We will kick off this week with a lecture, our lustrum reception and dinner. We'll be trying our hardest to get you another Trending topic for this lecture. Expect some brilliant speeches to start off our reception too! Although our association was actually founded on March 6th, due to exams we will formally celebrate this on this day.

On Tuesday, we have a members lunch in store for you! We'll gather in the /Pub for lunch, as this is our extra special lustrum members lunch we will get you some extra tasty food!

Wednesday is the day for another traditional highlight of the year, the cocktail night! Everybody is invited to the /Pub for cocktails and to celebrate our association's anniversary in style! Fancy dress is not required, but highly appreciated.

Thursday it is time for not one, but for two events! The first will be a workshop with one of our partners, details will be announced later. In the evening we can relax from all the hard work of the workshop during our cinema night!

On Friday you will have the opportunity to use the energy you saved during previous night's activity by going to the pool. Not just any pool, but the one and only Tikibad! We do advize you to stay neatly in line at the counter here, else you risk getting into fights and going viral on the internet.

After the last lustrum week, some of you might expect the lustrum year to slowly fizzle out. That's as far from the truth as we could get! On May 1st the Symposium committee will organise their Cyber Security symposium! We, of course, applaud them for finding such a relevant and #Trending topic, well done!

Two weeks later the biggest event of the entire lustrum year will take place, the Hackathon! In teams of three you are challenged to tackle a problem using an API, framework or dataset supplied to you by one of our partners. You will have to do this in less than 24 hours. The eventual winner will be selected by our grand jury and will receive some fantastic prizes. Note that the Hackathon is not just any programming competition! Design and knowledge of statistics/optimization can be equally important if you want to win, so multidisciplinary teams are highly encouraged! To those of you who want to become better programmers, we are looking into the opportunity of giving (short) workshops to improve your coding skills.

On Friday June 2nd, at the end of an exam week, we will organize our #ending party. Although it is one of the last activities of the year, we will try to get you some extra special entertainment on this night and to end the year with a bang!

On the 23rd of June it is time for our final event, the day at the lake! Here we can relax and chill in Delftse Hout after such a busy year. We will also have an auction where you can buy goodies. These goodies can be bought using credits earned during our lustrum game. The lustrum game is a yearlong race filled with a series of challenges. Time and endurance will be an important factor during each of these challenges. Those who will persevere will be rewarded during our day at the lake. For more info on our lustrum game and all our other activities, we advise you to stay tuned and check our website www.lustrum.ch regular

Lustrum Gala

Noor van Ruyven

This year is W.I.S.V. 'Christiaan Huygens" 12th lustrum and this should be celebrated in a luxurious and decadent fashion! And what better way to celebrate such an important year than with a luxurious and chique gala: the Lustrum Gala "The 12 gods of Mount Olympus".

On the 16th of December a group of 300 evenly distributed guys and girls will travel to castle "De Berckt" in Baarlo for a taste bud triggering dinner, a great party and maybe even a magical overnight stay in the castle. We get to enjoy the great tunes of our band of the evening, Capital S, followed by an awesome DJ!

Capital S has as many as 12 band members playing. Not only do they play some fantastic funk and some danceable disco, they are also very skilled with playing some sexy seducing soul. Every performance is a whole new party! Hearing them in your life, even once, is a must and this must be the perfect opportunity!

But a white-tie gala is no white-tie gala without taking your significant other to the party. This is the chance for the guys to show their potential dates how much of a gentleman they actually are! However, there's a twist. This year's white-tie gala will be held in 2016, which happens to be a leap year and thus, changes the traditions of the gala a slight bit. Normally, men ask their possible asset (not to be degrading to women) to the gala, but now, the tables have turned. Yes, ladies, this year all power is in your hands! You can let the guy (or girl, whatever you are into) you are into know what you, maybe, feel for him or her without having to throw all your feelings on the table.

Traditionally you send your crush a letter stating you like them and that you'd desire to take him or her to the gala. Of course this letter ends with you asking the recipient as date to the gala: silver letters on a blue paper for the guys and golden letters on a pink paper for the girls. Now, we understand that not everyone has these items and probably doesn't know where to buy them. So, we've come with a solution: after ordering your ticket online, you can come and pick up your own Do-It-Yourself gala letter writing kit at the board of W.I.S.V. 'Christiaan Huygens'. This is our way of making everything super convenient for you.

After you've sent your so carefully written "confession letter", they'll invite you to their home for a lovely cup of tea or coffee. During this nice moment of intimate enjoyment of your warm beverage, there will be no talk of the gala. However, after your visit it will be very clear what both parties can expect and whether you'll have to find yourself a new date. If you receive a beverage and nothing but a beverage, this means you've been rejected by your crush. If you receive a delicious cookies on the side, you've got yourself a date, but you can't expect much else after that. If you receive some homemade or "home bought" cake as a side, you got yourself a date, but you'll have to seduce him or her during the gala if you wish for any future between the two of you. But if you receive some cake with whipped cream during this pre-date, you've already seduced him or her and you've got yourself a date and a high chance for a future with this person!

After you've so delicately selected and seduced your date for the night, you'll have to decide what to wear! For guys this isn't too difficult: a white tie (or a "rokkostuum" in Dutch). Even though the choice of clothing isn't difficult, the finding and buying is. But no worries, we've also found a solution for that! On the 16th of November we organize a fitting day: you can fit and buy a complete white tie from Quality Tailors at our own /Pub!

For girls the choice of clothing is always difficult, but we can't really help with that. You can choose your own look! The only thing we can recommend is that if you decide to wear a pair of high heels, to also bring a pair of flats along for the moment your feet get really, really tired (which they probably will).

As soon as you've prepared for everything and you see your date in their amazing outfit, you'll know it was all worth it.

It'll be night you won't forget, so don't miss out! You can get your tickets and extra information on the Gala on our website at *http://wisv.ch/gala*.

AreaFiftyLAN!

Emiel Rietdijk

In the weekend from the third through the fifth of June, we had the most epic gaming event of The Netherlands: the second edition of AreaFiftyLAN! A group of about 200 students came together for a weekend of gaming and to have a lot of fun! Just as with the first edition, the second edition was a great success!

The months leading to the event, there was a massive amount of people who have put effort into making this event such a success. Everything except for the network has been developed in-house in spare time: the website, registration system, wristband system, planning, layout, seatmap, pickup service, prices and so on. In the end it was all worth it. After the last week of hard work we were ready for the event to kick off.

AreaFiftyLAN started on Friday June 3rd. At 18:00, the first gamers were waiting to get started. The event started off with a welcome speech from the committee followed by a tournament of Rocket League. Many enthusiastic players participated in this tournament of this relatively new game. In the beginning of the night the finals took place and were broadcasted on the big screen in the gaming hall.

Besides the Rocket League tournament there was also room for other tournaments organised by participants themselves. Those who didn't participate in the Rocket League tournament could take place in one of those tournaments or, as many others did, prepare for the tournaments of the next day.

After a good night rest, well... for most of the participants, everybody walked in fresh and awake to start of their second day at AreaFiftyLAN. Today was the day of the other three main tournaments: League of Legends, HearthStone and Counter Strike: Global Offensive. All of the participants were very excited to participate in one of these tournaments!

Firstly, we started with the League of Legends and Counter Strike tournaments just before noon. After the first round of these tournaments, the HearthStone tournament started off as well. During the whole day, everyone was playing their game and all tournaments were taken very seriously, since everyone wanted to claim that first place!

After an intensive day of gaming, everyone was very hungry. Luckily, there was a great meal arranged for everyone. At around eight o'clock there was Chinese food for everyone to get fuelled up for a few more rounds of gaming and for the tournaments. After the main tournaments came to a rest, it was time for the other tournaments organized by the participants. There were tournaments of all sorts of games, with, for example, Team Fortress 2, Minecraft, Just Dance and Achtung Die Kurve! Besides these side tournaments, the committee had also arranged a poker tournament. Just outside the gaming hall there was a room reserved for all people who wanted to play and enjoy this awesome card game.

When everyone had finished their tournaments and most of the people had found their bed it was time for the 4 o'clock Cup a Soup! In the middle of the night, at 4 a.m., there was free soup for all participants still awake, which were surprisingly still quite a lot of people. However, eventually everyone went to sleep to prepare for the next day.

On day three, the day of the finals, all finalists of the tournaments played on Saturday had to play the (semi-) finals on the last day of AreaFiftyLAN. All finalists were stoked to become first and win awesome prizes! All finals were played separately, so each final could be streamed on the big screen in the gaming hall or, in case of the League of Legends final, on a big screen in the LaunchArea. Lots of people were watching these intensive finals!

Finally it was time for the award ceremony. All winners of the tournaments were asked to come forward to claim their prize and a round of applause. After the ceremony it was time for the ending of the second edition of AreaFiftyLAN. It was an awesome event!

We can't wait for the third edition of AreaFiftyLAN in the weekend of the 3rd till the 5th of March! Hope to see you there!


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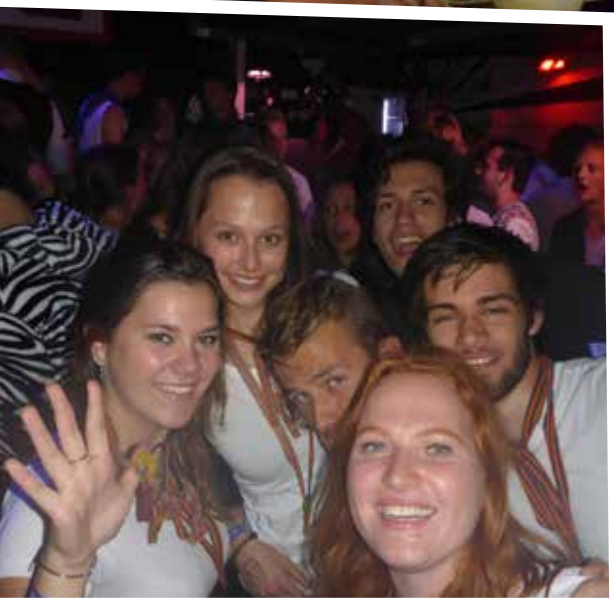



ACQUIRE

Developing a User Experience: the scientific way

Tim van der Lippe

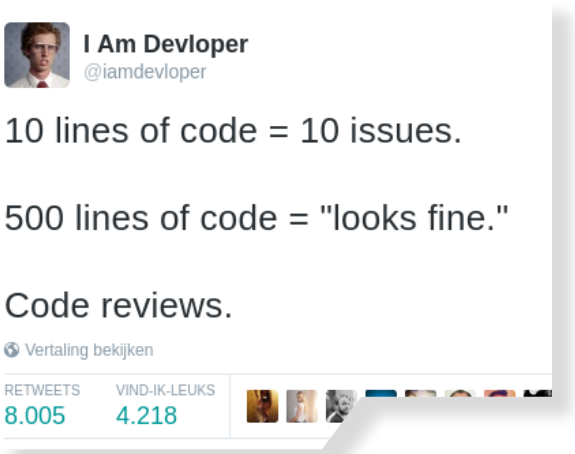
Last year Thomas Smith, Eva Anker and I did our Bachelor End Project at the TU Delft with the guidance of Alberto Bacchelli (who also played the client role) and under the academic supervision of Alessandro Bozzon. While the actual project started in June 2016, we started searching for potential topics in December 2015. In a couple of months we evaluated various topics proposed by researchers of the Software Engineering Research Group as well as the Programming Languages group. After careful consideration, the topic we would be working on for 10 weeks was determined to be "Enhanced GitHub code review". The primary reason for choosing this topic was our daily usage of the code review interface of GitHub where we experience several shortcomings.

Scientific evidence of shortcomings

However, our personal experience is not sufficient scientific evidence of shortcomings in the GitHub user interface. The first two weeks of the project were dedicated to reading scientific papers of state-of-the-art research performed on code reviews and summarizing the shortcomings discovered in those studies. Roughly twenty papers were summarized and discussed by us; assessing the quality of the paper, the relevance for our own project and which findings required insights from different papers.

In total ten papers were selected to be included into our research section. The most notable findings included the observation that while code reviews are somewhat successful in finding defects, most benefits stem from the communicative nature of such reviews [Bacchelli and Bird, 2013](1). Moreover, recent findings correlate code reviews with decreased post-release defect counts [McIntosh et al., 2014](2).

The efficacy of the user interface of a code review tool has a big influence on the code review process and how thorough code reviews are performed by developers.



Representation of the core issue in the form of a funny tweet

In concrete terms, the GitHub interface does not scale with large pull requests. While small pull requests are easy to grasp and giving feedback is fairly simple, for large pull requests this is not the case at all. Since the context of changes is important in understanding the underlying relations between functions/objects, reviewers need to digest the changes in a broader scheme. For large pull requests, grasping the impact of a big set of changes in the application as a whole is hard, if not impossible, with the current GitHub interface. There is no way as a contributor to guide a reviewer or provide context (in the form of descriptions) for a set of changes. Moreover, large pull requests tend to attract lengthy discussions in multiple places of the code. Currently GitHub shows all discussion in one big overview, where it is hard to grasp the status of a pull request, what piece of code is currently being discussed and what the timeline is of merging the pull request (e.g. what still needs to be done before it is ready to be merged).

After a discussion with our client, the design phase started. Taking into account the deficiencies reported in the scientific papers, we focused on creating a smooth workflow for creating pull requests and presenting the pull request in a form which should be easy to review. The challenge was two-fold: using the tool should result in minimum overhead compared to the time spent using the GitHub interface. Additionally, reading and processing the pull request in the new format must be at least as intuitive, clear and feature-rich as the options provided by GitHub.

We spend a whole week on setting up the project in terms of tool configuration, project infrastructure and an initial page skeleton of the webpage, while at the same time sketching and drawing mock-ups on the whiteboard and discussing design and implementation details with the team. At this point we were fairly confident the design we developed solved most of the pain points.

Core Design

The core design decision was to split up a pull request in groups. A group is a set of hunks. A hunk is a set of additions and deletions in a file, usually with a couple of lines context before and after the changes. The author of a pull request can order groups and hunks however he/she wants. A direct result of this approach is that in a large pull request, important changes can be moved on top of the diff view in contrast to the alphabetical approach of GitHub. Consequently, reviewers can incrementally review a pull request. Notably they can review groups and hunks at a time, giving a reviewer maximum flexibility for large pull requests.

After building a prototype with Polymer (the web components library our application is based on), most of the core functionality was usable in read-only mode. The user could view specific pull requests with groups and hunks where we manually inserted the data into our database. This approach was sufficient

for evaluating the usability and intuitively of the interface. Using the prototype, we started another research phase by employing Rapid Iterative Testing and Evaluation (RITE) to qualitatively evaluate the usability of our tool.

A group of unsorted changes with several hunks of additions and deletions

Evaluation with RITE

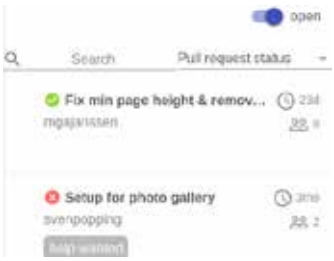
RITE is an evaluation method, which focuses on resolving user feedback as quickly as possible. RITE starts with a single user whom will be asked to execute certain tasks, developed by the team members. While doing so, the user will provide feedback regarding the usability (is it clear what actions are required to perform the task) and the look and feel (is the interface intuitive, minimalistic and good looking). It is possible that a user is stuck and does not know how to proceed. At this point, the team member writes down at which point the user was stuck and explains how the user should proceed. Another possibility is that a certain button is incorrectly positioned or improperly styled. All feedback is collected and the team discusses all points to determine whether 1. Immediate action is required 2. Action is required but it is not super important 3. No action is required (the team does not agree with the feedback). All points in category 1 have to be fixed before a new user can test the application. All points in category 2 have to be fixed at some point, sooner rather than later, but are not blocking for continuing the iterations of RITE. The process of feedback collection and fixing issues continues until 5 consecutive users provided no points, which are placed in category 1. At this point, the team can be fairly confident the interface is usable and intuitive.

Concrete example

One concrete example we encountered while evaluating the prototype was the placement of the button to create a pull request. Since creating a pull request is an essential step in the whole contribution process, it was crucial to get the interaction right. Initially we placed the button in an overview of the whole project on the right-hand side of the screen. This overview contains general information such as number of open pull requests, number of open issues and the latest opened pull request. While it was logical to place the button here, users were unable to discover where the button was located and they could therefore not continue with the process of creating a pull request. We discussed this feedback and we all agreed that this feedback resided in category 1: we had to fix this issue as soon as possible.

The create pull request button next to the activity overview

After several design iterations, the button was placed on top of the pull requests list. We expected that the logical connection between currently opened pull requests and adding a new one was sufficient enough for users to figure out how to create a pull request. The very next user was tasked to create a pull request and without any help and in a couple of seconds he was able to figure out. This was also apparent for every later user and we were confident that our design was more intuitive than the earlier iteration.



The create pull request button as a plus, next to the pull requests list

Building the tool, with our tool

While we were interviewing users, we continued working on the tool itself. Quite quickly the tool was no longer read-only but we could actually submit pull requests to the repository of our tool, WITH our tool. At this point our core functionality was implemented, evaluated and approved by our client. We had some extra time to build a graphical 2D space to be able to drag groups and denote importance by drawing connections between groups. In the end, our scientific research to provide proof of pain points in the GitHub interface as well as scientific approach of evaluating our own tool allowed us to build a product that proved to solve the posed issues. If you want to try it out yourself, visit *https://preview-code.com* and log in with GitHub. The source code is available at *https://github.com/preview-code/frontend.*

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A Real-Time Fracture Method

Bert Bosch

Action sequences in movies and games have a lot of explosions and destruction. Almost every object is pre-fractured and if the sequence is played again it will look exactly the same. Players do not do exactly the same thing over and over again. What they do with an object should be visible in how the object breaks.

Personal goal

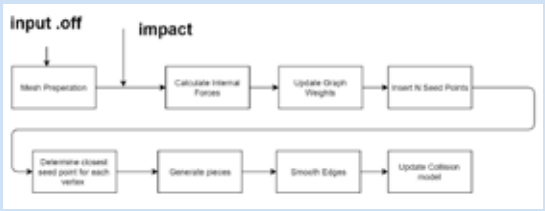
In my master thesis project I wanted to fix the following problem: Develop a method that the way you deal damage to an object will be visible in the way it splits into pieces. Doing this I combined physical based methods with geometry based methods. To get a viable method, the development is done in Unreal Engine 4.

Current game method

Current methods work with Voronoi Diagrams, this is a mathematical method to split an object based on seed points. A number of seed points is specified and inserted into random places inside a model. Regions around the seed points are grown such that the space around a seed point is closest to that point and not the other seed points. This will result in a subdivision of the object. When the object is hit, the model will split into these pieces. To increase the usability of this method, the pieces are held together with force springs. When the force on a sub piece is greater than a certain threshold, that sub piece will break from the rest.

Previous paper

My solution is based on a paper by Schwartman, C. and Otaduy [1]. This paper suggests using a physical based method to calculate internal forces and use these values to split the model using a geometric method. To calculate the internal forces Finite Element Method is used and afterwards Voronoi Diagrams to split the mesh. This general idea is used and new methods were developed.



Figuur 1: Method

Overview method

In figure 1 an overview of all the steps of the new method is shown. Each part is explained in the next sections.

Material properties

To calculate the internal forces, the Finite Element Method is used. This requires material properties to function properly. Each material in the world has certain properties. To model this inside a simulation we need to find parameters to replicate these properties. For this thesis only linear elasticity model is used. Linear elasticity models materials as continua. The material properties used are: density, Young's modulus and the Poisson's ratio.

To determine when a object breaks, a stress-strain relation is used. Stress is a physical quantity that expresses the internal forces that neighbouring particles of a continuous material exert on each other. A strain is a measure of deformation representing the displacement between particles in the body relative to a reference length. In this relation there are two thresholds, the plasticity threshold and the fracture threshold. When a force is placed upon the object the stress and strain will build. The object will deform and if the stress-strain relation is below the first threshold the object will go back to his original form when the force is taken away. When the first threshold is exceeded the model will have a permanent deformation. When the second threshold is exceeded, the model fractures.

There are different types of materials, brittle materials and ductile materials. Brittle materials have the two thresholds close to each other. Ductile materials are the opposite, a large deformation is needed before the object will break. This thesis is focused on brittle material. This means that the object has almost no plastic deformation and fractures almost immediately, glass is a good example of this. For calculating the fracture threshold the energy density is used. In the next section this will be explained.

Energy density

Formula's used for energy density and FEM are based on the formula from [2]. The linear elasticity model is used. This defines the strain energy density as follows:

$$\Psi(G) = \mu\epsilon + \frac{\lambda}{2}tr^2(\epsilon) \tag{1}$$

Where ϵ is the small strain tensor and μ,λ are the Lamé coefficients. tr(x) Is the trace of the matrix. This is all the values on the diagonal summed up. These are related to the material properties.

$$\mu = \frac{k}{2(1+v)}, \quad \lambda = \frac{kv}{(1+v)(1-2v)}) \tag{2}$$

Where k is the Young's modulus (measure of stretch resistance) and v is the Poisson's ratio (measure of incompressibility).
The small strain tensor is defined as follows:

$$\epsilon = \frac{1}{2}(G + G^T) - I \tag{3}$$

This formula is designed to do reliable measure of deformation for small motions only. Large deformation scenario's will give unreliable results. The energy density is dependent on G, the deformation gradient. G is defined as follows:

$$G = D_s D_m^{-1} \tag{4}$$

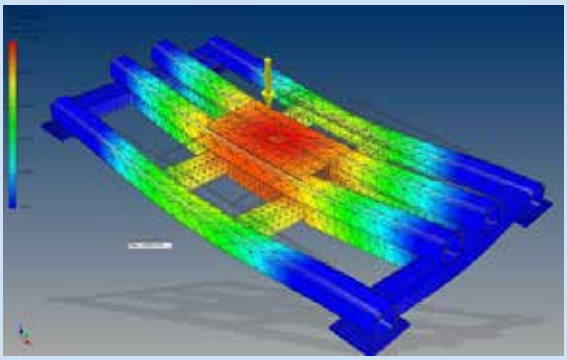
Where D_m is the undeformed configuration and D_s is the deformed configuration. D_s is build from D_m and the displacement calculated with FEM. Since G is constant over the linear tetrahedron, the strain energy of an element is reduced to:

$$E_i = \int_{T_i} \Psi(G)d\bar{X} = \Psi(G_i)\int_{T_i} d\bar{X} = W.\Psi(G_i) \quad or \quad E(X) = W.\Psi(G(X)) \tag{5}$$

Where W is the volume of the element T_i. The total energy density is the energy of all elements together.

Finite element method(FEM)

FEM is a numerical method to find approximate solutions to boundary value problems for partial differential problems. FEM subdivides a large problem into smaller parts. These smaller parts are called the finite elements. The equations of the smaller parts are assembled into a larger equation. This larger equations is a good approximation of the original problem. In figure 2 a FEM solution is shown. Where the object is red the deformation is high and where the object is blue the deformation is low.



Figuur 2: FEM

To implement this for games it needs to work in real time. FEM that gives a really accurate solution take a lot of time and is non linear in time. For games a linear FEM model and preprocessing is used to speed up the calculation.

With FEM the displacement of the elements is calculated when a certain force is applied. First the model is split into finite elements, for this thesis tetrahedrons are used. To realize this the tetgen library is used. Tetgen uses a 3D Delaunay Triangulator method to split a object into tetrahedra.
To make the deformed configuration used in making D_s, the displacement of the tetrahedrons are needed and this gives us the following formula to solve:

$$Ku = F \tag{6}$$

K is the stiffness matrix, u is the displacement vector and F is the force vector. This formula is for each tetrahedral and the matrices are assembled into a master matrix to calculate the final result.
The stiffness matrix is build for each tetrahedral with the following formula:

$$K^e = VB^T EB \tag{7}$$

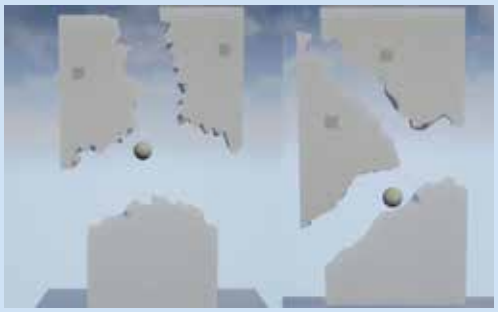
V is the volume of the tetrahedron, B is the strain field and E is the stress field. When the master stiffness matrix is assembled it is transformed into an upper triangle matrix. This because then the solution can be calculated in real time. When the displacement vector is calculated, the energy density can be calculated. This to determine if the object will fracture.

Weighted centroidal Voronoi Diagrams

When the fracture threshold is exceeded, the mesh needs to be split into pieces. For now it is assume that the mesh is split into x pieces. The number of pieces can be specified by the user or by other functions that use the energy as input. For dividing the mesh Voronoi Diagrams are used. As said this subdivides the model into pieces surrounding inserted seed points. Inserting random points will give random shape and size pieces. To get better shaped pieces, Centroidal Voronoi Diagrams is used. The goal of this method is that the seed point is the center of gravity of his region. To realize this the Lloyd's method is used. The random seed points are taken and the region is grown around them. The center of gravity of those regions are taken as the new seed points. This is repeated until it converges. This gives a perfect separation of space of the mesh. When a object fractures, around the impact point there will be smaller pieces and further away there will be larger pieces. By using the energy as weights for the region growing the pieces will become smaller where the impact is. The region growing is done on the tetrahedral mesh. From this a graph is build and with a path finding algorithm the regions are grown.

Break lines

After the weighted Centroidal Voronoi Diagrams, each vertices inside the tetrahedral mesh has been assigned a seed point. The first method of splitting the mesh was by separating the tetrahedrons. Each tetrahedron is assigned to a seed point. The left wall in figure 3 this result is shown. The break line is not visually appealing and so a smoothing of the break lines is needed. Two different methods have been developed. One splits the tetrahedrons that belong to multiple seed points and uses the distance to the different seed points as weights for splitting. This result is the right wall of figure 3 The last method is using a plane between neighbouring seed points, this will result into straight break lines.



Figuur 3: Break lines

Result

The goal was to develop a method that works in real time. The total time of the algorithm is around 0.02 seconds, fast enough for 30 fps. This is almost a viable time frame to use this method inside a game.

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Computer Science

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The Internet Touch

Fernando Kuipers

The vision of a tactile Internet includes transporting touch in addition to audio-visual interaction. In this article, we highlight our own work and some of the open challenges towards materializing that vision.

Touch me if you can

What if the Internet could be used to extend your touch in such a way that you would be able to interact with distant humans and cyber-physical systems[1] as if they were near? The potential applications would be endless and in some cases even might make the difference between life and death. One illustrative example is that of a surgeon who, via the Internet, controls a robotic arm to perform surgery on a patient in a different country. In general, transporting touch over the so-called Tactile Internet facilitates (1) transporting skills, for instance in health, design, manufacturing and repair, (2) education, through more intense and realistic learning experiences, and (3) enhanced social interaction, by literally being able to reach out. It may seem as science fiction, but devices already exist to transport touch, although presently they still lack the sensitivity we expect and are accustomed to.

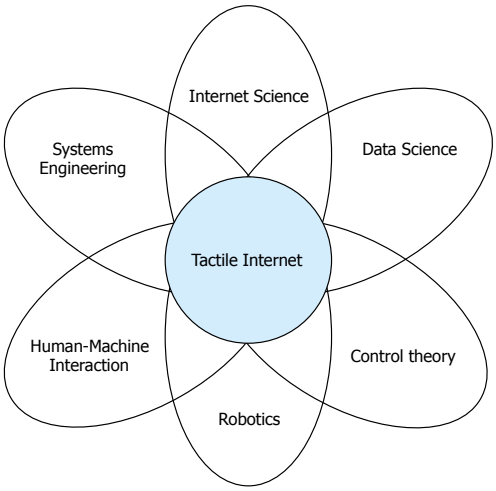

Figure 1: Many disciplines have to join forces to realize the Tactile Internet.

For all of the aforementioned application domains, the latency experienced should be very small, the connection should be highly reliable, haptic sensitivity should be present, etc. Indeed, as illustrated in Figure 1, realizing the Tactile Internet relies on consolidating advances in many disciplines. Robotics (or in this case the more appropriate term "cloud robotics") are needed to be able to control objects from a distance. As a result, also the field of human-machine interaction is applicable. There, the notion of "Quality of Experience" perceived by users needs to be revisited if touch is added to the equation. The fields of systems engineering, control theory, and data science are needed, since we are dealing with a system that is controlled by exchanging data. Our work, as we will describe in the following, fits under the umbrella of Internet Science.

[1] A cyber-physical system refers to an interacting network of physical and computational components, possibly controlled by humans from a distance.

The 1 ms challenge

In order to have real-time interaction, the round-trip latency between the communicating entities should not exceed 1 ms, else we perceive it as being unnatural. Unfortunately, even at the speed of light, this bounds the radius within which we would be able to communicate to 150 km. If we are to go beyond that boundary, this means we have to anticipate (and correct for) certain behavior, for instance via machine learning tools.

If a surgeon is operating remotely on a patient, a hick-up in the Internet connection could have devastating consequences. A highly reliable connection means that any failure of the connection cannot last longer than 1 ms per day. In that short time, the original connection needs to be restored or an alternative connection must have been set up. Note that this is in stark contrast to the 50 ms fail-over times currently permitted under "carrier-grade resilience."

A foundation for the future

In the current Internet, information from an application, like a web-browser, is cut into little pieces, which are put into IP packets, where IP stands for "Internet Protocol." These packets consist of a data part, i.e. the piece of information, and a header, which contains some fields, including one for the destination address. The packets are sent onto the Internet and are being forwarded by devices, such as switches and routers, based on the header. The switches and routers do their best to forward the packets to a next device closer to the destination, but generally cannot provide any guarantees on performance parameters like latency.

Since the Internet can be seen as an infrastructure for infrastructures, solving the challenges of the Tactile Internet will also provide a strong foundation for other, not necessarily touch related, domains that rely on the Internet. For example, smart buildings, smart energy grids, smart cities, e-health, autonomous vehicles, factories of the future, cloud robotics, etc.

Software-defined networking

Software-defined networking (SDN) is considered to be a revolution in how the Internet is controlled and may be just the technology we need to leap-frog towards the Tactile Internet. In SDN, see Figure 2, switches only perform data-plane functionality (that is, per-packet forwarding) and rely on a controller platform that provides the control-plane functionality (the "intelligence," like computing the forwarding rules and installing those in the switches). In contrast, traditional networking equipment embodies both functionalities into one physical device.

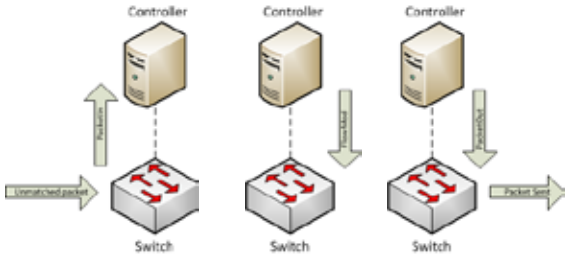

Figure 2: A switch (1) asks a controller if it knows how to handle a packet, (2) gets a rule installed by the controller if not, and (3) uses the rule to forward the packet towards the destination.

The decoupling of the data and control planes as in SDN, among other advantages, enables making tailor-made decisions on a per-flow[2] basis and offering guaranteed Quality of Service (QoS) – in contrast to the current best-effort service – for instance in terms of low latency.

The main potential of SDN lies in enabling modular network configuration through the use of network abstractions; just as operating systems for PCs rely on abstractions over multiple levels to manage their hardware resources. This modularity allows protocols etc. to be introduced/debugged/extended quickly and safely, instead of experiencing decade-long transitions (as for instance seen with IPv6).

In our work, we have developed OpenNetMon [1], a tool to measure QoS parameters in an SDN network, and we were the first to beat the 50 ms fail-over barrier needed for carrier-grade resilience [2], [3].

Stateful networking

The 1 ms requirements with respect to latency and reliability require us to anticipate certain events. Since, at a given time, one of multiple events may manifest, we have to prepare accordingly. As such, we have to provide different (SDN) rules for different states the network is in. For example, if a part of the network has been compromised for whatever reason, one may want to steer the network traffic in a different direction than for the uncompromised state. Hence, a prominent example where stateful networking would be useful is that of network resilience. Even at this moment, according to the Global Risks 2015 report from the World Economic Forum, critical information infrastructure breakdown is the most impactful technological risk. The report also states that the second most likely risk to occur (after interstate conflict) is that of extreme weather events, such as hurricanes. This, together with the even more stringent demands of the Tactile Internet, requires us to rethink how to protect our networks.

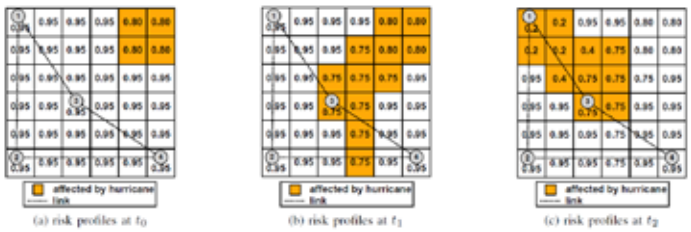

Figure 3: The network consists of four nodes in an area represented by a grid. The availability of the parts affected by the hurricane (in orange) reduces. In the last two time-slots, the availability of the network is affected.

As illustrated in Figure 3, in case of a disaster like a hurricane, a network that would be able to predict the hurricane's path and inflicted damage, might consider different network states over time, and as a result may mitigate large-scale connectivity disruption by steering its traffic over the most reliable connections. Our algorithms to compute those reliable paths are presented in [4]. By proactively changing paths, fail-over might be avoided altogether.

The concept of stateful networking does not only pertain to resilience, but can in principle link any event to a state. For instance, if a device is highly utilized, it might want to react differently than when it would have been idle. Or if a certain high-priority flow was just allocated, a device may want to sent other flows onto an alternative path to avoid interference. The network itself might even move to a different state by moving the locations of where certain network functions are executed, as in Network Functions Virtualization (NFV), where network functions (like firewall functionality) run in a virtualized environment on standard high-performance servers – akin to the principles of cloud computing – instead of on dedicated equipment per network function.

Like a puppet on a string

Wireless (5G) technology will be an important component of a Tactile Internet. After all, we want to maneuver freely and not be connected to a wire. However, in order to support the demand for higher and higher data rates, the wireless range over which we communicate must come down and, consequently, the number of these so-called smaller wireless cells will go up[3]. In our recent survey article [5], we describe how SDN has been used in the context of wireless networks and the Internet-of-Things and we list several open challenges.

One clear challenge relates to dealing with the increase in cells and devices. One proposal to address this scalability problem is called Fog Computing. There the compute, storage, and networking resources are not only available from dedicated servers, but also from user devices or at the edge of the network.

The road ahead

Clearly, there is more to say about the Tactile Internet than a 2-page article permits. We have simply provided a small sample of our own work that fits under the umbrella of the Tactile Internet. Recently, we (together with RangaRao Venkatesha Prasad) have initiated a joint project with the Indian Institute of Science, to collaborate and jointly supervise two PhD students on the topic of the Tactile Internet. If you would like to know more about the Tactile Internet, then you may want to start with the survey of Simsek et al. [6]. If you would like to actually work on the topic yourself, then feel free to contact me at F.A.Kuipers@tudelft.nl to discuss how we can join forces: after all, plenty of challenging problems still need to be solved...

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[2] A flow is a stream of packets belonging to the same application.

[3] Larger cells will likely co-exist, as they may serve different kinds of applications. For instance, LoRa is a novel technology for wireless sensor networks that specifically aims to connect many sensors at low data rates over long distances. If you want to know more about this, check out our new community at https://www.thethingsnetwork.org/community/delft/.

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Binary Puzzle

Daphne van Tetering

Rules:

A binary puzzle should be solved according to the following rules:

1. Each box should contain a zero or a one
2. No more than two similar next to or below each other are allowed
3. Each row and each column should contain an equal number of zeros and ones
4. Each row is unique and each column is unique
5. Each binary puzzle has only one solution, which can be obtained without guessing

		1								0	
			0		1		1		1	0	0
1						0	0				
1	1									0	
							1	1			0
1	0		0	1		1		0			
1									1	1	
			1								
1			1		0	0		0	0		0
			0			0			1		
			0	0	1						1
	1							1		1	

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Mathematics

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Extending the SSVI model with arbitrage-free conditions

Sebas Hendriks

Since it has become clear that the Black-Scholes formula is not a good method for pricing options, correct methods are still being sought. One possible alternative is the modelling of the volatility surface, which can be calibrated on market data in order to provide proper market insight.

Option pricing

In order to hedge risk, financial institutions make great use of options to help them in this pursuit. These options come in several different types, the most basic of which are European options, which can be either put or call options. A European call option gives the holder the right, but not the obligation, to buy an underlying stock at a future time T, called the maturity, for a price K, called the strike. A European put allows the holder to sell the stock at maturity T and strike K. If we say that a stock follows a path such that it has the value S_t at time t, meaning that the current stock price is written as S_0, we can say that the payoff functions for these options can be written as:

$$p_{call} = \max(S_T - K, 0) \text{ and } p_{put} = \max(K - S_T, 0). \tag{1}$$

As the options have a non-negative payoff, we will have to pay at time $t = 0$ for this privilege, namely the option price. The market only gives option prices for a number of strikes and maturities, so we want a formula to find the prices for any maturity and strike. A formula was provided in 1973 by Fischer Black and Myron Scholes [1]:

$$\begin{aligned} C(T,K) &= DF_T(F_T\mathcal{N}(d_1) - K\mathcal{N}(d_2)), \\ P(T,K) &= DF_T(K\mathcal{N}(-d_2) - F_T\mathcal{N}(-d_1)), \end{aligned}$$

where DF_t and F_t are the discount factor and the forward price at time t, $\mathcal{N}()$ the standard normal distribution and:

$$d_1 = \frac{\ln(F_T/K) + \frac{1}{2}\sigma^2 T}{\sigma\sqrt{T}} \text{ and } d_2 = d_1 - \sigma\sqrt{T}, \tag{2}$$

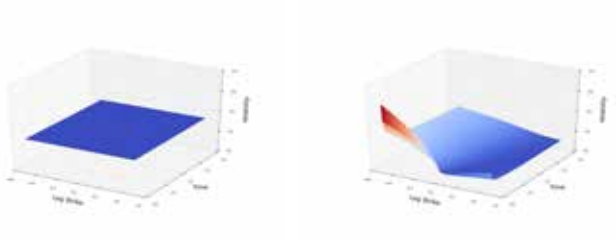
where σ is the market volatility. From market data we can find the values for DF_t and F_t using put-call parity:

$$C(T,K) - P(T,K) = DF_T(F_T - K), \tag{3}$$

meaning that we have a direct relation between the market volatility σ and the option prices. In this model, it was assumed that this volatility was constant for a given stock for all strike and maturity values. After the crisis in 1978, it was found that the market corrected this value for extreme strike values, resulting in a skew in the volatility which is often called the volatility smile.

$$\sigma_{BS}(t,K) : (t,K) \mapsto \sigma_{BS}(t,K). \tag{4}$$

This means that instead of a constant volatility surface, we have a surface that is a function of both the option maturity and strike.



(a) B-S volatility surface *(b) Implied volatility surface*

Volatility surface modeling

A volatility surface can be modeled in terms of the total implied variance $t \cdot \sigma^2_{BS}(k,t)$, with the log strike $k = \log\left(\frac{K}{F_t}\right)$ is known to be parameterized. An example of this is SSVI, developed by Gatheral and Jacquier [6], where we parameterize the implied variance as:

$$w(t,k) = \frac{\theta_t}{2}(1 + \rho\varphi(\theta_t)k + \sqrt{(\varphi(\theta_t) + \rho)^2 + (1-\rho^2)}), \tag{5}$$

where $\theta_t := t\sigma^2_{BS}(0,t)$, $\rho \in (-1,1)$ and $\varphi : \mathbb{R}^*_+ \to \mathbb{R}^*_+$. We do however need to verify that this model is free of static arbitrage. As described by Carr and Madan [2], this means that the surface needs to be free of both calendar spread and butterfly arbitrage. First, the volatility surface w is free of calendar spread arbitrage iff:

$$\partial_t w(k,t) \geq 0, \ \forall k \in \mathbb{R}. \tag{6}$$

Also, if we define: $g(k) := \left(1 - \frac{kw'(k)}{2w(k)}\right)^2 - \frac{w'(k)^2}{4}\left(\frac{1}{w(k)} + \frac{1}{4}\right) + \frac{w''(k)}{2}$, the volatility surface is free of butterfly arbitrage iff:

$$g(k) \geq 0, \ \forall k \in \mathbb{R} \text{ and } \lim_{k\to\infty} d_1(k) = -\frac{k}{\sqrt{w(k)}} + \frac{1}{2}\sqrt{w(k)} = -\infty. \tag{7}$$

For SSVI, this means that the surface is free of butterfly arbitrage iff for all $\theta > 0$:

$$\theta\varphi(\theta)^2 \leq \min\left(\frac{16}{\theta(1+|\rho|)^2}, \frac{4}{1+|\rho|}\right). \tag{8}$$

Under these conditions, it can be shown that the model calibrates very well on index option data. However, we propose an extension of the model where ρ is no longer a constant and has become a function of θ_t that lies in $(-1,1)$, so:

$$w(k,t) = \frac{\theta_t}{2}(1 + \rho(\theta_t)\varphi(\theta_t)k + \sqrt{(\varphi(\theta_t) + \rho(\theta))^2 + (1-\rho^2)})). \tag{9}$$

For this surface, the butterfly arbitrage condition remains the same as the one derived for SSVI, now only with the non-constant ρ. However, for the calendar spread arbitrage, with setting $\gamma := \frac{1}{\varphi(\theta)}\partial_\theta(\theta\varphi(\theta))$ and $\delta := \theta\partial_\theta(\rho(\theta))$, it can be found that eSSVI is free of calendar spread arbitrage iff: $\frac{d\theta}{dt} \geq 0$ and $|\delta + \rho\gamma| \leq \gamma$ and either:

Mathematics

- $\gamma \leq 1$, or
- $|\delta + \rho\gamma| \leq \sqrt{2\gamma - 1}$.

We choose $\varphi(\theta) = \eta\theta^{-\lambda}$ and $\rho(\theta) = a\exp(-b\theta) + c$ and under the arbitrage free conditions we can calibrate both SSVI and our proposed improvement, eSSVI, on the same SPX data by minimizing the distance between model and market prices. The 2-norm distance between the market and model prices in bps of the forward price that are averaged for the maturities of up to one month, up to a year and over a year are displayed in Table 1. It can be seen that eSSVI performs much better than SSVI, where in particular early maturities see an increase in performance of nearly 50%.

Time	Up to 1 month	1m to 1y	1y +
SSVI Distance	0.372	0.291	1.320
eSSVI Distance	0.191	0.198	1.064
Performance increase	48.8%	32.0%	19.4%

Table 1: Distances between model and market prices

Another advantage, that is shown in Figure 2, is the fact that, if we calibrate both models on daily option data, it can be found that in times of high volatility such as a financial crisis, eSSVI does not suffer a major increase in the error between model and market prices. The only exception is when, due to market instability, market data is not completely reliable, causing a nearly identical calibration of the SSVI and eSSVI surfaces. In Figure 2, daily option data from June to December 2015 is used, where a crisis in China at the end of August caused market instability. The figure shows that the SSVI error suffers during this period, whereas eSSVI remains relatively steady.

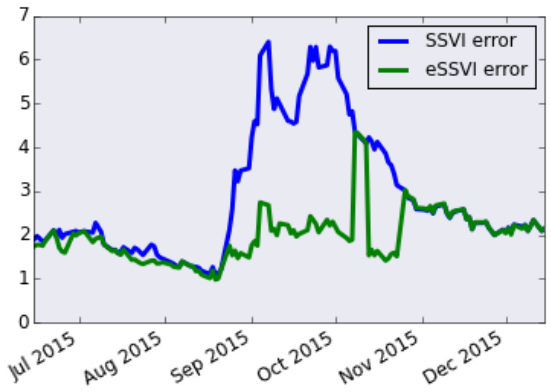


Figure 2: Evolution of SSVI and eSSVI daily model error

SSVI equivalent local volatility

An alternative to volatility surface models in the pricing of options are local volatility models. However, it is generally difficult to generate local volatilities based on market prices. A possible solution is to transform implied volatilities to local volatilities. The local volatility can be found using Dupire's formula [4]:

$$\sigma_{loc}^2(T,K) = \frac{2\frac{\partial C}{\partial T}(T,K)}{\frac{\partial^2 C}{\partial K^2}(T,K)}. \tag{10}$$

However, as derived by Gatheral [5], we can translate this to an expression in terms of total implied volatility w:

$$\sigma_{loc}^2(k,t) = \frac{\frac{\partial w}{\partial t}}{\left(1 - \frac{kw'(k)}{2w(k)}\right)^2 - \frac{w'(k)^2}{4}\left(\frac{1}{w(k)} + \frac{1}{4}\right) + \frac{w''(k)}{2}} = \frac{\partial w/\partial t}{g(k)}.$$

This expression also displays the importance of the arbitrage-free conditions, as they essentially require the positivity of σ_{loc}^2. Using this local volatility, it is now possible to price most options. For instance, path dependent options like American options can be priced using a trinomial tree, as described by Derman [3]. We can now use this method to calibrate a volatility surface for almost any type of option using this transformation of the surface to local volatilities, and then finding option prices using trinomial trees. What remains is to minimize the distance between model and market prices.

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Solving the open day timetabling problem using integer linear programming

Dilan Gecmen

Every year, several students write their bachelor thesis in order to conclude the bachelor phase. Last academic year I was one of the students that was able to, finally, finish their bachelors in Applied Mathematics.

One of my favorite mathematical subjects was definitely optimization, so as a subject for my thesis I wanted to choose something in the direction of optimization. Together with my supervisor Dr. P. L. van den Berg I chose to conduct research on how to optimize schedules for an open day organized at a secondary vocational education in the Netherlands.

Timetabling problem

The timetabling problem is known as a large class of problems that fall under the mathematical field of scheduling. In recent years the timetabling problem has been greatly studied and published in literature. The scheduling research community has developed many techniques that enable better solutions to practical scheduling problems, but there is still a lot that remains to be done. For each scheduling problem there are different requirements and creating a timetable really depends on what is considered a good quality schedule for a specific problem.

I suppose everybody knows who Bill Gates is. In high school he wrote the school's computer program to schedule students in classes. There were several basic requirements. For example: "A student cannot be scheduled for two classes at the same time. "As a young boy, Gates also had his own requirement which he found very important. He tweaked the program's code so that he was placed in classes with mostly female students. As you can see, you can achieve a lot when creating a schedule.

Problem description

The scheduling problem I addressed has arisen in the context of community colleges in the Netherlands. In the town Ermelo a general open day is organized at the Christian college Groevenbeek each year, which is a preparatory secondary vocational education. Teachers from several community colleges come here to give information sessions on studies provided by the community college. There is a total of 32 different studies that are represented on this open day and there is a presentation on each study.

The open day consists of a morning and an afternoon programme and is meant for students from 12 schools in the region of Ermelo. Through the morning and afternoon the students will be picked up from their schools by buses, which will bring them to the Christian college Groevenbeek. At the end of their sessions they will be driven back to their schools.

An open day gives students insight in potential studies, so it is important that each student is able to follow presentations on all their preferred studies. To guarantee this, we need to have multiple rounds of presentations. A round consist of several different presentations, which take place at the same time in different lecture halls. For each study there is just one teacher available, that is why presentations, which take place at the same time, are all presentations about different studies.

We want to make a tailored schedule that consists of 4 rounds for each day part. To create such a schedule we need to determine a suitable number of lecture halls with sufficient capacity taking into account the data we are given.

Once we have found a feasible solution, we would like to improve the quality of the solution. So what makes a schedule good? In general, a schedule is definitely better when there are as little gaps as possible. As students will be stuck at the college for an entire day part, it does not matter if the schedule for each student contains gaps. On the other hand, the schedule for each teacher who gives presentations on a course needs to contain as little gaps as possible, because they do not want to spend their whole day at the school. Besides gaps, a schedule is also good when there are little presentations. A gap is a round where a teacher is not scheduled to give a presentation but has to be present. We calculated the total workload in hours.

Integer linear programming

The mathematical model for a timetabling problem consists of requirements that are represented by linear relationships. Linear programming (LP) is the method to achieve the best outcome in such a model. In many practical applications of LP and also for our timetabling problem the variables are restricted to integer values. A linear problem with the additional constraint that all variables are integers is called ILP. Methods that are commonly used to solve ILP are the branch, bound and cutting plane method.

To implement mathematical models and to visualize data we used the software AIMMS. To actually solve the timetabling problem AIMMS invokes the solver CPLEX, which uses a combination of branch and bound and the cutting plane algorithm to solve the ILP.

ILP formulation

First, to give recommendations about the number of lecture halls and lecture hall capacities based on 4 rounds in each day part, we created a feasibility model. The students are given by the set I and the set of studies they can choose from is given by J. Note that the set of studies is nothing else than the set of teachers, as each teacher represents just one study. To assure that each student is able to follow each of their preferences we need a number of rounds, which is given by the set K. The number of available lecture halls is given by the set L. Also the capacity of each lecture hall is given by c_l with l in the set L. For each student we also need to know which study they have chosen. This input is denoted by a_{ij}.

$$a_{ij} = \begin{cases} 1 & \text{if student } i \text{ has chosen study } j \\ 0 & \text{otherwise} \end{cases}$$

We introduce two binary variables. These variables create the schedules we need. A schedule for each student and a schedule for each teacher. The first variable is x_{ijk} which assigns each student and each of their preferred studies to a round.

$$x_{ijk} = \begin{cases} 1 & \text{if student } i \text{ follows study } j \text{ in round } k \\ 0 & \text{otherwise} \end{cases}$$

The second variable is y_{jlk}, which assigns each study to a lecture hall and a round.

$$y_{jlk} = \begin{cases} 1 & \text{if study } j \text{ is given in lecture hall } l \text{ in round } k \\ 0 & \text{otherwise} \end{cases}$$

The open day gives students insights about potential studies. So we want a schedule where each student is able to follow each of their preferred studies. We do this by checking each round on whether a student is assigned to a particular study. This is done for each student and for each of his or hers preferences.

$$\sum_{k=1}^{r} x_{ijk} = a_{ij} \qquad \forall i \in I, \quad \forall j \in J \tag{1}$$

For each study just one teacher available. We check for each study if the sum overall lecture halls in each round is at most 1.

$$\sum_{l=1}^{p} y_{jlk} \leq 1 \qquad \forall k \in K, \quad \forall j \in J \tag{2}$$

We also want to assure that a study is given in at most 1 lecture hall. We do this by checking in each round and for each lecture hall if the sum over all studies is at most 1.

$$\sum_{j=1}^{m} y_{jlk} \leq 1 \qquad \forall l \in L, \quad \forall k \in K \tag{3}$$

We do not want a student to be scheduled to follow two different presentations in one round, because as we already said we want them to be able to acquire knowledge about each study they have chosen. For each student we check in each round if the sum of all studies is at most 1.

$$\sum_{j=1}^{m} x_{ijk} \leq 1 \qquad \forall k \in K, \quad \forall i \in I \tag{4}$$

A student cannot be assigned to a study if that particular study is not given in that round.

$$x_{ijk} \leq \sum_{l=1}^{p} y_{jlk} \qquad \forall i \in I, \quad \forall j \in J, \quad \forall k \in K \tag{5}$$

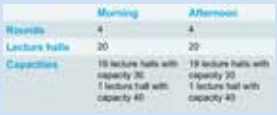
The number of students in each lecture hall cannot exceed the lecture hall capacity. We check the total number of students for each study in each round. After that we check if this number is not higher than the capacity of the lecture hall the study is assigned to.

$$\sum_{i=1}^{n} x_{ijk} \leq \sum_{l=1}^{p} y_{jkl} \times c_l \qquad \forall k \in K, \quad \forall j \in J \tag{6}$$

The previous constraints represent our feasibility model. The main goal was to create a good quality schedule. We consider a schedule with not many presentations a good quality schedule. To achieve this we minimize the total sum of presentations given.
In general, a schedule is good when there are as little gaps as possible. We achieve this by minimizing the total workload for each teacher. The workload of a teacher is the total time a teacher is present at the college, which consists of the number of presentations he has to give and the number of gaps he has in his schedule. We added the objective functions and the corresponding constraints to the feasibility model.

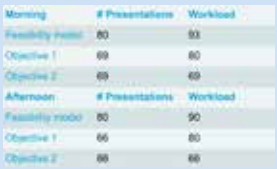
Results

We used two data sets we received from the Christian college Groevenbeek. One data set consists of applicants for the morning which is a total of 599 and the other consists of applicants for the afternoon which is a total of 534. Each applicant had to choose 3 studies to follow during the open day. There are a total of 32 different studies offered at the open day and for each study we know the number of applicants.



Figuur 1: Number of rounds, number of lecture halls and lecture hall capacities for the morning and afternoon.

Using the feasibility model we created the following scenario we found realistic. Note that we first solved the problem for both day parts separate. When we applied both objective functions to the sets of data we got the following results.



Figuur 2: Number of presentations and the total workload in the morning and afternoon when the feasibility model, objective 1 (minimizing the number of presentations), and objective 2 (minimizing the total workload) are applied to the data.

The lower bound for the number of presentations is 66 in the morning and 69 in the afternoon which are achieved by both objective functions which is quite remarkable. If we look at the workload the second objective definitely performs better than the first.
Putting the results of the second objective together the overall schedule still contains a lot of gaps. So we combined the sets of data to one big data set and applied the second objective to solve the problem. This reduced the number of gaps greatly.

Recommendations for future research

It was very time consuming to find an optimal solution, because of the size of the data sets. I would recommend to impose much more valid inequalities, because this would speed up the branch and bound solving process.
Besides the gaps in the schedule we also found the division of the applicants over the lecture halls not preferable. For further research, we definitely recommend to look into this. One way to solve this problem is to iteratively impose constraints to the second model based on a solution the model has given us. These constraints are added to studies where the division of applicants over the lecture halls is not preferable.
The timetabling problem is not an easy problem. There is definitely still a lot of research that remains to be done on this topic. I hope my thesis will contribute to existing research and give insights into future research possibilities.
I hope my attempt to summarize my thesis was clear enough for you to get an idea of my research problem and the conclusion. If you wish to get more context I gladly refer you to have a read through my thesis, please have a look at the references.
I would like to thank my supervisor Dr. P. L. van den Berg for his incessant support. Without his generous guidance none of this would have been possible!

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Largest proof ever

Laura Jetten

Marijn Heule; alumnus at Delft University of Technology is now also famous research scientist, since he and two others have created the largest mathematics proof that has ever been found!

Marijn Heule

Marijn Heule has studied Computer Science at Delft University of Technology. In the past, the alumnus has also been a member of the Dies, one of the second-year committees of W.I.S.V. 'Christiaan Huygens'. He was promoted at Delft University of Technology, where he finished his PhD in 2008 and is currently working as a research scientist at the University of Texas in Austin. His research consists of solving hard-combinatorial problems in for example number theory and he is an expert in satisfiability solving (he has developed award-winning SAT solvers).

The largest proof ever

Back in May 2016, Marijn Heule, Oliver Kullmann and Victor Marekhave solved a mathematical problem called "the Boolean Pythagorean triples problem". The problem has been a massive puzzle for ages and many mathematicians have tried to solve it before, without any luck. It is amazing that the problem has been solved. However, the most remarkable aspect about all of this is the size of the proof. The computer-generated proof is 200TB! A compressed version was made, which is 'only' 68GB, but according to Lamb[3] "a human could never hope to read through it". It took a super computer around two days to run through all possibilities.

How it works

The question is whether you could allocate a color to all natural numbers, either red or blue, so that if there is a solution to the Pythagorean Theorem, $a^2+b^2=c^2$, then a, b and c wouldn't all be the same color. Heule shows that, for the simplified problem, which means looking at the problem for solutions to $a+b=c$ instead of Pythagorean Theorem, there isn't a solution for allocating colors red and blue to a, b and c greater or equal to 5. As you can see in Figure 1, we choose to allocate blue to 1, which leads to choosing red for 2, blue for 4 and red for 3. Now 5 has to be blue and red at the same time, so only up until 4 there is a solution for $a+b=c$.

Figure 1: Visualization of simplified problem

Heule and the two others have found that for the real problem, with $a^2+b^2=c^2$, there is a solution to the problem up until 7824. There are multiple solutions in coloring integers up to 7824. One of such solutions can be seen in Figure 2, where a square can be either red or blue. However, if we have a, b such that c is greater or equal to 7825 there is no solution to color them in different colors.

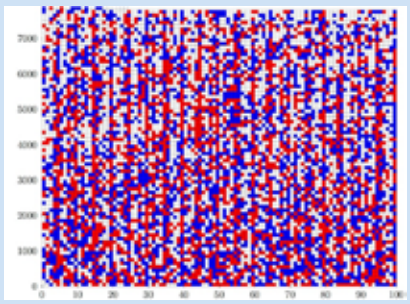

Figure 2: Visualization of the real problem

Criticism

People call the proof "ugly" and say it doesn't contribute to the understanding of mathematics. Another example of an "ugly" proof is a 13GB proof of a special case of the Erdös discrepancy problem by Alexei Lisitsa and Boris Konev. However, about a year and a half later, Terence Tao has solved the problem in an article that is only 29 pages long. Tao made use of Lisita and Konev's proof. So who knows, maybe in a few years time the Boolean Pythagorean triples problem might be solved in a less ugly, more satisfying way as well!

Next project

According to EenVandaag[6], Marijn is going to look into a problem called Ramsey "Number R(5,5)". For this problem, the question is: "How many people have to be present in a room, so that 5 people know each other and 5 don't?". The problem is well-known and a lot of research in this area has been done already. Two examples are "Ramsey Number $R(3,8)=28$" [4] and "Ramsey Number $R(3,9)=36$" [1]. In the first case, this means that 28 people have to be present in a room, so that 3 people know each other and 8 don't (or the other way around). The second case is similar. According to McKay & Radziszowski (1992) [5], the number of people that have to be present in a room in the "Ramsey Number $R(5,5)$" problem is equal or smaller than 53.

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Miscellaneous

Science trends

Rebecca Glans

On this page you will find some brief information on recent scientific breakthroughs or interesting news. Whether they're big or small, if we think they might interest you, we will mention them here! Do you miss a certain trend or want to inform your fellow readers of an interesting innovation? Feel free to contact us.

Become a friendly hacker 'pl0x'

Growing up with movies like The Matrix[6] and WarGames[5] while Mister Robot[3] currently being one of the highest rated series, you could say our society is fairly interested in hacking. This isn't necessarily a bad thing, unless that interest evolves into committing actual crime; apparently teen hackers are on the radar. According to a report written for Europol, researchers have found parallels between the way youngsters become hackers and how they become addicted to drugs and alcohol. Thus they could use programmes developed to tackle and educate about substance abuse to fight cybercrime as well. With this report it is not claimed that (all) hackers are addicts, but simply that the way youngsters fall into hacking is similar to the way they would become drug addicts.

It starts with easy access to online tools and tutorials. By experiencing quick successes and thus pleasure (caused by the hormone dopamine) these youngsters could be encouraged to go even further. The biggest problem then becomes that these "hackers" don't think of the internet being a place under surveillance of a (legal) guardian. They also "normalize" their behavior by encouraging each other. We all know about the combination of peer pressure and (underage) drinking, some still experience it as undergraduates. It's kind of the same with hacking: these youngsters don't hack for money, but to simply increase their reputation among other hackers — a boost of self-esteem they cannot create in other aspects of their life —. The report suggests to help these youngsters by introducing them to role models and ex-cyber criminals, teaching them what harm their hacks can cause and showing them what "good" they can do with their talent. They should be encouraged and rewarded for doing the right thing, rather than restricting their Internet access.[4]

Lots of pieces of paper equals profit?

Some of us might be considering to do a PhD and maybe even build a career as a well know scientist. One would think this requires careful and just research, which would result in papers with reasonable impact and thus become recognised in the science world. Unfortunately the opposite is true.

A scientist is considered successful if he publishes papers with a certain impact and new findings. For such papers he may receive awards and funding to do more research/ science. The problem this creates, according to psychologist Brian Nosek, is "that the incentive system is focused almost entirely on getting research published, rather than on getting research right". When applying for academic jobs, young scientists may have a history of dozens of published papers. Reading and evaluating all of them takes a lot of time, so hiring committees refer to numbers instead: number of papers, number of times these papers were cited etc. Some kind of fraud could easily slip through this system as well. Scientists Paul Smaldino and Richard McElreath simulated this heuristic approach by using a model for natural selection in a biological ecosystem. The way "low effort" labs — producing sloppy and even unreproducible science — succeeded was undesirable. Considering papers are peer-reviewed by other scientists and scientists are offered jobs by hiring-committees consisting of other scientists, the problem sits with the scientists themselves. A culture change is very much needed if we want to remove bad practice and prevent unethical research.[1]

I still have only 2 parents

This year, a boy was born with the DNA of three people. He is the first to have been born from a spindle transfer. This technique replaces the mitochondria (which are passed on by the mother) in the embryo with those of a female donor. Although this child has been dubbed a "three-parent baby" pioneering clinical embryologist Jacques Cohen rejects this term as "mitochondrial DNA does not contribute to a person's traits". The boy's biological mother has some mitochondria mutations that would cause the fatal neurological disorder Leigh Syndrome. She fortunately does not have the syndrome, but could pass it on.[2]

Figure 1: Fertility doctor holding world's first child born from spindle transfer [2]

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Historical Person: Alan Turing

Irene Vooijs

Alan Turing was an eccentric mathematician who played an important role during the Second World War. You might have seen the movie 'The Imitation Game', which is dedicated to his intriguing life. His findings about algorithms and computations can be considered to be the basis of computer science.

Turing was born in London on 23 June 1912. His parents had to travel to India every now and then because of his father's work, which meant that he and his brother John had to stay with a retired couple at those times. At an early age, Alan Turing's teachers already recognized his talent in mathematics and sciences. When he was 16, he studied the work of Albert Einstein and understood it. During this time, he got to know his good friend Christopher Morcom. Morcom might have been his first love, and he died in 1930. Turing was in deep sorrow, and focused even more on mathematics and science.

After public school, Turing went to Cambridge University and gained first-class honors in mathematics. Turing proved the central limit theorem, but only learned afterwards that Jarl Waldemar Lindeberg already proved it 12 years earlier. Despite this, he was elected a Fellow of his college, which means that he was chosen to work with a group of other learned people at Cambridge.

Turing developed the Turing machine, which is an abstract thinking process. It is used to determine the limits of mechanical computations. He proved that his machine could perform any mathematical computation, if it can also be written as an algorithm. Or in other words, his machine could compute anything that is computable. His proof was only published shortly after Alonzo Church, who released a similar solution using his lambda calculus.

During the Second World War, Turing participated in the breaking of German ciphers. He started working with the British code breaking organization GC&CS in September 1938, the day after Britain declared war on Germany. The Germans used Enigma machines to encipher their messages, and Turing focused on breaking the code with Dilly Knox. The Polish Cipher Bureau was also busy with the decrypting, but their method relied on an indicator procedure, which the Germans changed in 1940. Turing developed the British bombe, which was an electromechanical device with rotating drums that simulated the movements of the rotors of the enigma machine. He wrote two papers about his findings during the war, which were only made public on April 2012 because they were very valuable for the GC&CS and its successor GCHQ.

Turing had some eccentric characteristics that didn't stay unnoticed to his colleagues. A fellow cryptanalist Jack Good said that Turing used to chain his mug to the radiator pipes to prevent it from being stolen. Next to this, Turing was also a talented runner and even tried out for the British Olympic team of 1948. In 1945, Turing was awarded the OBE, order of the British Empire, for his work during the Second World War. However, what he did exactly remained secret for many years.

After the war, he worked on the design of the automatic computing, and presented the first detailed description of a stored-program computer. Unfortunately, the full version of his design was not built after his death. In 1949 Turing became the Deputy Director of the Computing Machine Laboratory and worked on software for one of the earliest computers at the Victoria University of Manchester. To define whether a machine could be called 'intelligent', he developed the Turing test. The test is whether or not an interrogator could tell the difference between the computer and a human being in conversation.

When Turing was 39, he started a relationship with Arnold Murray. When he was burgled that year, he mentioned his relationship to the police. During that time, homosexual acts were criminal offences in the UK, and they were both charged with gross indecency. During the trial, Turing plead guilty on advice of this brother and solicitor. The sentence consisted of a hormonal treatment, which included injections with a synthetic estrogen. He could no longer work for the GCHQ, the British signals intelligence agency.

On June 1954, Turing was found dead by his housekeeper on his bed, with a half-eaten apple beside him. The post-mortem examination revealed that the cause of death was cyanide poisoning. The apple was not tested for cyanide, but it was speculated that it was indeed the means by which the cyanide was consumed. After research it was determined that Turing had committed suicide, and some biographers have suggested that he was enacting a scene from Snow White and the Seven Dwarfs. Another theory that has nothing to do with the apple is that Turing inhaled cyanide fumes from an apparatus that dissolves gold with potassium cyanide, which he had set up in his house.

Interview: “De verenigingsverzamelaar“

Maikel Kerkhof & Daphne van Tetering

We all have hobbies, some of us like to play sports, binge-watch series on Netflix, play games or even collect coins. Others, however, prefer extraordinary hobbies, such as dog grooming, train surfing or even soap carving which is a big deal in Japan. A few weeks ago, we met with Sabine van Holsteijn (22), also known as ‘De Verenigingsverzamelaar’. As you might get from her nickname, her hobby is all about student- and study-associations. For many years, Sabine has lived in Delft, which she calls her “epicenter”.

Together with Maikel, secretary of the current board of Study Association ‘Christiaan Huygens’, I was given the opportunity to interview Sabine. So, after grabbing a donut and some coffee, she answered all our questions.

How it all started

Since Maikel and I already met Sabine a year earlier, we thought preparing questions wasn’t necessary, since Sabine is a very social person. We soon turned out to be right, because Sabine took it upon herself to explain to us where her love for student- and study-associations comes from. It all started back in 2007, when she became familiar with student-associations ‘DSC (Delftsch Studenten Corps)’ and ‘Virgiel’ in Delft during the Introduction Week. She saw a flag of Virgiel hanging outside, and later she also saw a yearbook of the association in a book store. In 2009, she started collecting various items of student associations, however, it wasn’t until 2011 that she first visited a study association. While she was still getting to know all the associations in Delft, our association, also abbreviated as CH, couldn’t be missed.

So, in 2013, Sabine first came to CH. The board of that year, board 56, was very welcoming and their chairman, Karens Grigorjancs, even inspired Sabine to create her own website. What he didn’t know then, was that Karens would be the key to Sabine’s success. After creating the website, she became a famous person all over the Netherlands, known for the pictures and stories she wrote on her website after each visit.

The following years, Sabine kept visiting, but it wasn’t until the chairman of board 58 personally invited her to visit ‘the Owls in Delft’ once more, that she felt really connected to our association. Since then, she has been to serious affairs, such as the Dies reception and the Constitution drink but also to fun activities, like the first-ever edition of AreaFiftyLAN!

Collectors items

As mentioned before, Sabine is also collecting items from the associations she visits. This made us wonder how many items of CH Sabine has collected so far. Since she is proud of her collection and all the items in it, she could give us some really accurate numbers. Sabine has five volumes of MaCHazine, five yearbooks, an old-generation choker, a new-generation tie, a pen, several notebooks, two mugs and constitution cards from boards 57, 58, 59 and 60. She is still missing the constitution card from board 56, so if you’re reading this and you have a spare, you could make her very happy with it!

In general, Sabine has collected 362 yearbooks, from associations all over the country, which are exhibited in five bookcases!

Awards and certificates

As a sign of gratefulness, Sabine has created several awards and certificates that can be earned by the associations she visits. These awards can be obtained for very specific reasons, such as ‘best yearbook’, ‘best study association’, ‘best student association’, ‘the mr. Sunshine contest’ and many more.

Earning such an award is a big honor, and we are very proud to announce that CH has won the prize for best yearbook two years in a row now, and won the prize for best study association last year! Since we want to win again this year, we asked Sabine what things we had to achieve or improve in order to win. One thing that is really important, is to win the yearbook-prize again. Not to put any pressure on the new yearbook-committee.. Other things that are essential are keeping in touch with her and creating interesting MaCHazines, which we intend on doing (of course)!

Fun facts

When travelling across the country and meeting a lot of different people, new habits emerge. In the years she’s been doing this, Sabine has developed the habit of listening to specific songs, when traveling to a certain association. When coming to us, Sabine often listens to one of these songs: “Forever young” by Alphaville, “Feel this moment” by Pitbull or “Shots” by the Imagine Dragons. According to her, the more songs an association has, the better the contact: the study association of Mechanical Engineering has about 20 songs, while the study association of Electrical Engineering has none.

Another fun fact: Sabine has four favorites committees at CH: AnnuCie (Yearbook committee), MaCHazine (the lovely people behind the scenes of this edition), Wocky! (the people who will be bartending at our events) and the FlitCie (CHs very own paparazzi).

12th Lustrum

As some of you may know, this year is our 12th Lustrum, which was opened on October 10th with a bird show. Since Sabine was there, we wanted to know whether she enjoyed it. During the show, several owls were present. From the small owl named Slayer, a barn owl named Sjors and a bigger owl named Joep, they all showed us how well they could fly by almost touching our heads when flying above us. Sabine liked Joep the best, since he was a bit stubborn and liked sitting on the grass better than flying through the air. Also, she enjoyed a talk with prof. Rothkrantz, an honorary member who was interviewed in our last edition.

Fortunately, the bird show isn't the only thing happening to celebrate CH's 60th birthday! When asking Sabine which activities she is planning to attend, it seems that she knows the Lustrum-calendar pretty well! She couldn't make it to the beer tasting, because she already had other plans, but she would really like to come the white-tie gala! It has been Sabines wish for a few years now to attend a student gala, and maybe this year she'll finally have the chance. The white-tie gala will be held in on the 16th of December, which means that the gala will be held in a leap year. According to the etiquette, in a leap year the girl has to send the boy a pink letter with golden handwriting, instead of in a normal year where the boy has to send the girl a blue letter with silver handwriting, asking her to the dance. This means that Sabine will have the chance to ask her own date, so maybe we will see her on 16 December!

Other events where we will be seeing her are the Lustrum reception, the cocktail evening. There is also a slight change she will be joining us at AreaFiftyLAN even though she's not that much of a gamer.

On behalf of the MaCHazine, we would like to thank Sabine for her much enjoyed stories and her time. Most important, we look forward to meeting her again on one of CH's many activities!

Wiskunde Informatica Studievereniging 'Christiaan Huygens'

Soft Skills Academia

Big Players Start Ups

Learn about your career possibilities! This new program will offer lectures and workshops regarding a career at a big company, starting your own company, an academic career and soft skills! In every quarter two or three lectures/workshops will be given regarding that quarter's subject.

Next Up:

8th of December -- 18:00

Most people start working at a company after they have finished their graduate project. Some, on the other hand, will continue in the field of doing research by the means of a Phd.

This panel will host a discussion on doing a Phd. Phd'ers from different stages will come together and introduce what a Phd is, and what it means for them. The discussion will be led by Alexandru Iosup, the teacher and IT researcher of the year of the whole of the Netherlands.

http://wisv.ch/phdpanel

Calendar

Lustrum Gala

December is, as always, a less busy month. On the 6th of December we will celebrate Sint Nicolas with a lunch and if we're lucky, a special guest will join us! Next will be a Career College lecture, in which you will learn about doing a Phd. We will end the month, and year, with the 'Oliebollen'-drink and Christmas Dinner.

The T.U.E.S.Day lecture

with Sebastiaan Breedveld will be the last activity before the exam period starts. After that, we will continue with the committee kick-off and the Gala fitting day, where you can buy your white tie for the gala for a reduced price. To end the month there will be the ADSL: drinks with your teachers in the /Pub!

Pre-Skiing Trip drink

The Christmas holiday ends the second week of January. The first activity of the year is the pre-skiing trip drink, to get in the mood for the skiing trip in February! Next will be the T.U.E.S.Day lecture by TNO and Career College lecture about academic careers outside of university. January will end with the start of the next exam period.

November

1	T.U.E.S.Day Lunch Lecture by Sebastiaan Breedveld
1	Birthday Dr. ir. R.J. Diependaal
10	Birthdays prof. dr. ir. A. Nijholt & ir. F. Ververs
15	Committee Kick Off
16	Gala Fitting Day
17	Career College 2.1: Writing Papers for Conferences
21	General Assembly
22	Lunch Lecture by MICompany
23	ADSL: Drink With Teachers
29	Birthday prof. dr. dr.h.c. L.J.M. Rothkrantz

December

6	Members Lunch
8	Career College 2.2: Doing a Phd
9	'Oliebollen' Drink
22	Christmas Dinner
26	Christmas Holiday

January

11	Pre-Skiing Trip Drink
14	CoH new year drink
17	T.U.E.S.Day Lecture by TNO
19	Career College 2.3: Academic Career Outside of University
27	Start of Exams