NEKST

VOL. 26
NO. 3
SPRING 2018
NEKST-ONLINE.NL

DEALING WITH DISASTERS

STATISTICS AND THE FORCES OF NATURE

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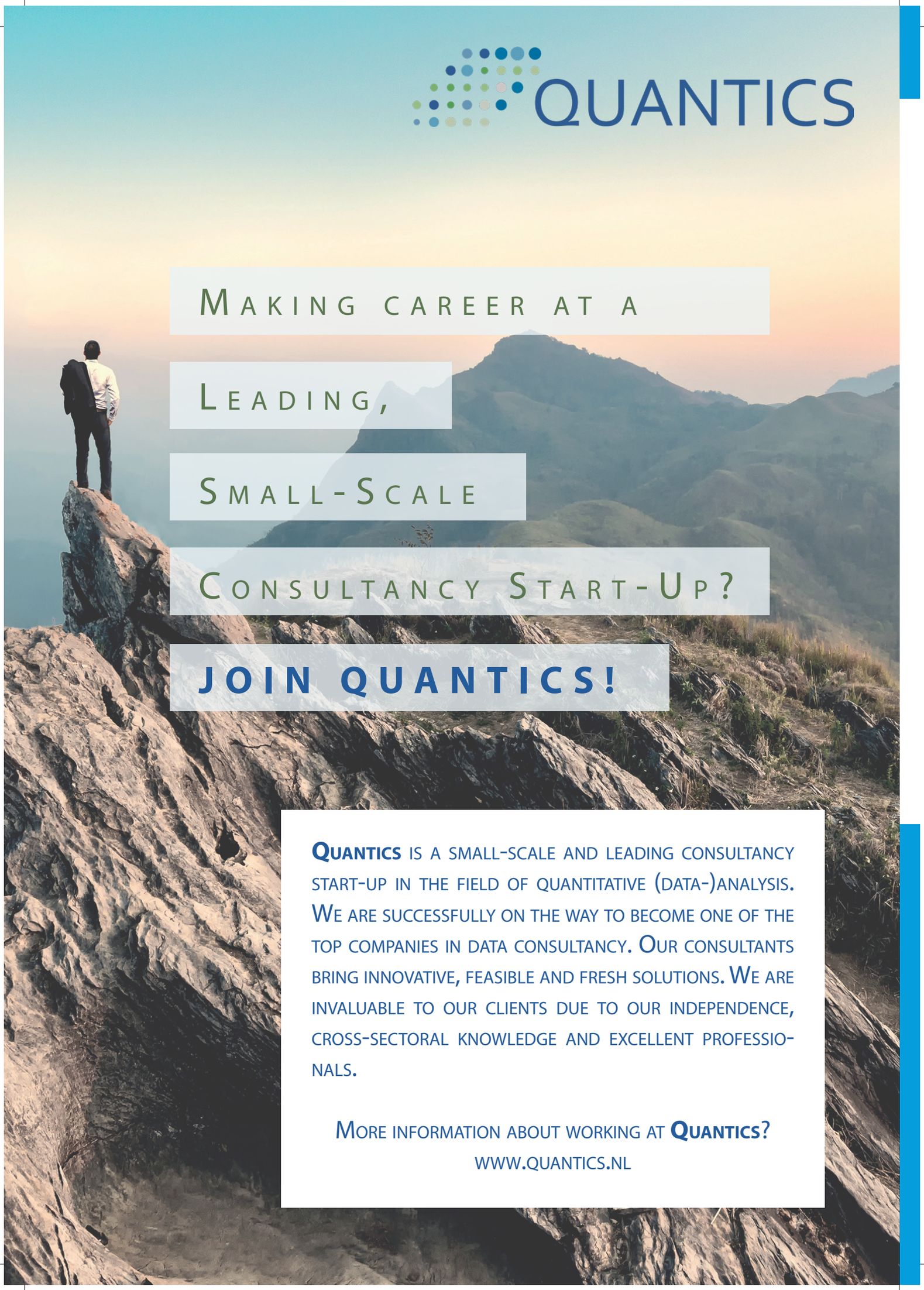

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Preface

Insights and Overview

As spring is approaching, nature is waking up again and fast coming into motion. As is our Nekst editorial staff, resulting in this extra bulky edition of Nekst. With pieces on theoretical mathematical problems such as bid optimization to the travel adventures of the Europe Trip, but also with insights into the inner working of Asset and Department Members Meetings, this edition should keep you entertained for quite a while.

After last edition's Machine Learning for Dummies, which can also be read on www.Nekst-Online.nl, we again present you with an entry that is also comprehensible for the lesser geeks. Have you always been interested in artificial intelligence, however does the vastness of this subject discourage you from diving in? Then Artificial Intelligence for Dummies is the article you have been waiting for. If your are more interested in the fields in which this is applied this Nekst also features 'Dealing with Disasters – Statistics and forces of nature', explaining what these fields, statistics and disaster management, have in common.

Also in the department of career development this edition is of value, with pieces on the new Jheronimus Academy of Data Science and the Landelijke Econometristendag as well as an interview with the data-driven consultancy company Quantics!

Let me not retain you from reading any longer. I wish you a pleasant, insightful, and most importantly, entertaining read. For more Nekst articles, exclusives and puzzle explanations visit www.Nekst-Online.nl.

Guus Vlaskamp
Editor-in-Chief

COLOPHON

Nekst is the quarterly magazine of Asset | Econometrics ©2018 Insertion of an article does not mean that the opinion of the board of Asset | Econometrics or the editorial staff is verbalized.

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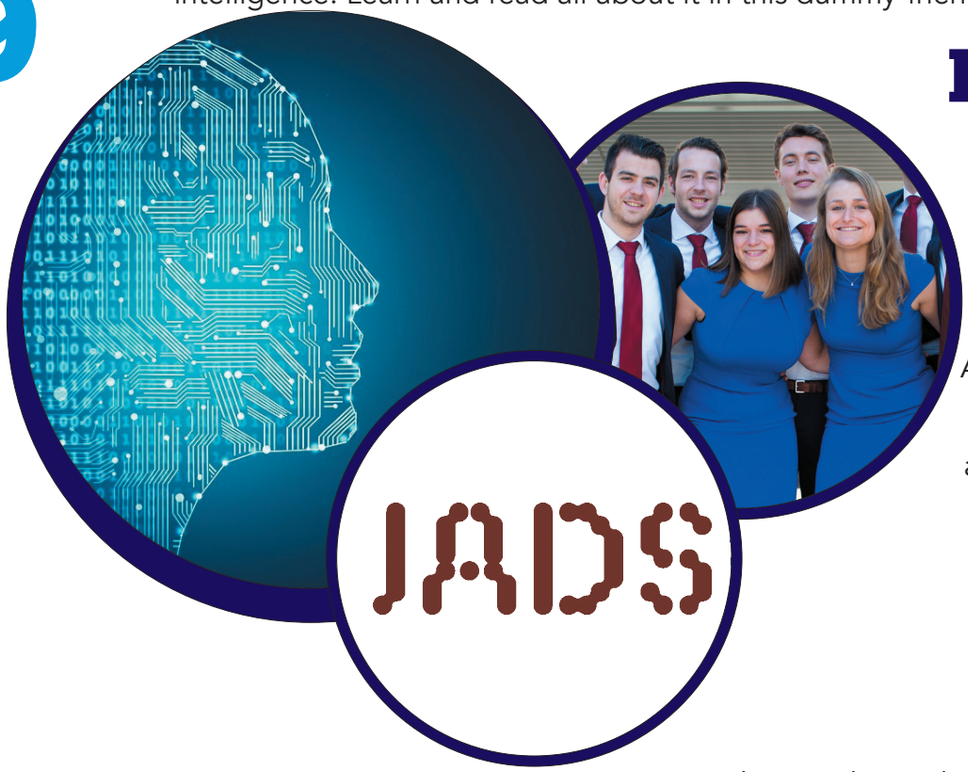
Printing
Gildeprint

Circulation
1000

AI for Dummies

9 For the freshest dummies: AI is the commonly used abbreviation for artificial intelligence. Learn and read all about it in this dummy-friendly piece.



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Have you always wondered who keeps the show running at Asset? Meet Lina Segers, Independent Asset Chairman and learn all about the inner workings of Asset.

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A new player on the academic playing field has arrived, Jheronimus Academy of Data Science. Situated in Den Bosch, the perfect embodiment of cooperation between TiU and TU/e is eager to meet you.

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Experience something new and going on an exchange, even in the last stages of your master's. Read all about Anouk Claassen's experiences.

47 Informal Activity

A first date with PwC, outside of the office. Engines, football and fun. Read about it on page 47.

Dear Members,

The new year is well under way and we hope you have enjoyed its first few months as thoroughly as we have. At this point, the general feeling among the board is one of pride and accomplishment, but most of all one of sincere gratitude towards our members and their amazing contributions to the association. The year is not over yet, though, so I would like to take a moment to not only look back at what we have achieved so far, but also to look ahead at the wonderful things to come!

The observant reader will already have noticed that this text is now accompanied by a different face. Those who are actively involved within our association are probably already familiar with me. For those who are not, I would like to introduce myself! My name is Jochem Bruijninckx, currently 21 years of age and this year I am the association's Treasurer. In addition, I have also held the function of Vice-Chairman. This finds its relevance in the fact that as of some weeks ago, Max van der Lee has parted ways with our board. As a result, it now comes to me to speak to you on behalf of the board: while the months ahead might seem full of uncertainty, we feel confident in our resolve to keep the association at the impeccable level it has always been at.

This level of quality has been showcased in numerable examples over the past months. Among them was of course the National Econometrician's Day (LED): one day, which six of our students have worked on tirelessly for a full year, to give students of econometrics from all over the country the opportunity to meet dozens of possible employers. The entire day felt like a celebration of the committee's incredible efforts and preparations, as the event went by flawlessly even though it hosted more students and companies than ever before. I would like to thank the committee one last time for the amazing experience and for showing Asset | Econometrics at its very best to the nation's econometricians!

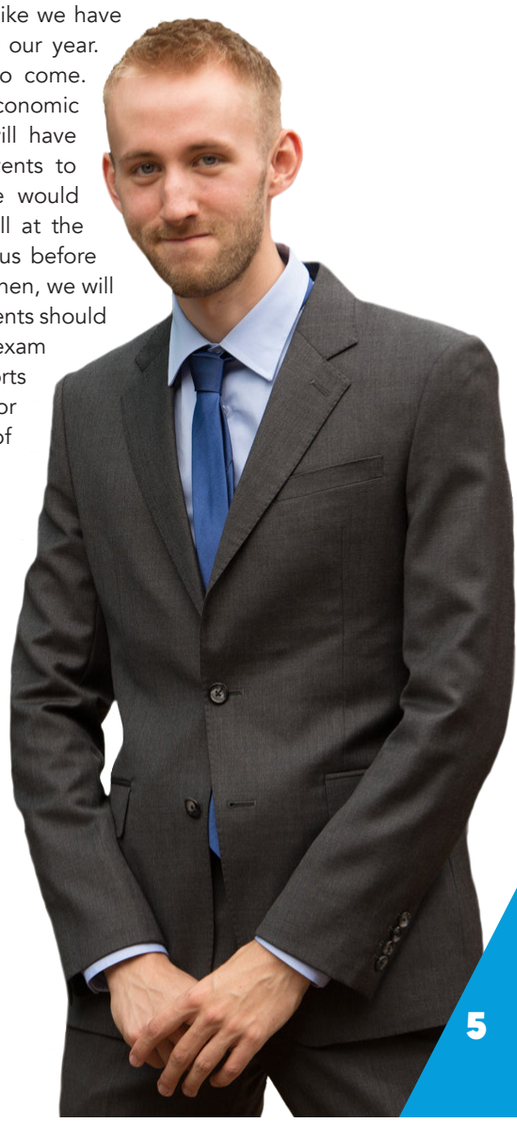
The end of February then saw us take a group of thirty members to the beautiful city of Prague in the first ever edition of the Europe Trip. Over the course of five full days, we explored the city's cultural highlights, (karaoke) bars and restaurants and even spent a night learning about the many rumours of Prague's ghostly presences in the blistering cold. Both the board and the committee feel very content with the positive response the participants had in regards to the new concept, though we feel next year's location might be best appreciated if it has an average temperature above -5°C.

With a fun Carnaval in between and a very successful edition of the Strategy Tour (for the first time held in collaboration with Maastricht's SCOPE | Vectum) it might seem like we have already passed the highlights of our year. There is, however, a lot more to come. Those who subscribed for the Economic Business Weeks Tilburg (EBT) will have some very interesting career events to look forward to. Afterwards, we would love to have a drink with you all at the yearly Asset | Econometrics cantus before you head into your exams. Even then, we will be there for you with many fun events should you wish to escape the stressful exam period. Join us at the yearly Sports Tournament or Summer Activity for instance, or drop by during one of our Monthly Afternoons!

For now, we wish you an enjoyable start to your Spring, which for many members will start with the legendary Active Members Weekend. Should I survive those three crazy days, you will hear from me again in this academic year's last edition of Nekst!

On behalf of the board,

Jochem Bruijninckx
Vice-Chairman
Asset | Econometrics
2017-2018



Meet the Crew!

Anouk Claassen

Anouk is a 25-year-old master's student who has joined Nekst once more in the final days of her academic career at Tilburg, while writing her thesis. Her main hobby is watching 'Goede Tijden Slechte Tijden', which she herself describes as 'strange' and 'erg, hè' (bad, sort of). Anouk likes to travel a lot too, she went on exchange last semester and if she had the money and time she would love to travel around the world, especially to New York City to see some musicals on Broadway. Like many of us, Anouk likes to party, but there is one small detail… she has to stay very long because she hates leaving first!

Text by: Aurel Macias Minambres

Aurel Macias Minambres

Aurel Macias Minambres is 24 years old and is currently a third-year bachelor's student. He likes playing chess in his spare time. If he has spare time, because that is sometimes a bit of a problem. Some funny facts about Aurel: He likes cheese in his soup, he is afraid of going bald in the future and 'sleep is his everything'. However, if he could choose a superpower, he would choose the power of not needing to sleep anymore. His personal motto is quite easy to follow: do not have a motto, it is easy to live without one. Well, those are some really wise words to close this introduction.

Text by: Linda Torn

DILEMMA 1

You are only allowed to eat for 10 minutes a day	You have to carefully watch one hour of Tel Sell commercials every day
	Anouk Aurel Charlotte Linda

Charlotte Nijman

After a semester without the Nekst committee, the 23-year-old master student Charlotte Irene Nijman joins the committee again. I think this makes us as happy as her niece and nephew are with her. Charlotte likes to spend her free time with going to the zoo with them and if she had only one more day to live, she would love to go to Disneyland Paris with her niece. Her love for children goes even further, because with € 10,- million she would build a small school for children with education problems. Surprisingly Charlotte does not want to play in a TV program for kids, but she wants to present the NOS journal.

Text by: Anouk Claassen

Linda Torn

Linda, better known as Janny Magdalena Torn, is one of the newest members of our Nekst committee! Linda is 22 years old and continued her bachelor's after her position as chairman in the board of Asset I Econometrics in 2016-2017. Linda likes working, having good times with friends and watching documentaries. Despite her habit of working very hard, Linda likes to snooze. She snoozes 25 minutes (5x5 minutes), every morning, no matter what. In order to enjoy her room during those long snoozing sessions, she bought two really big fake plants. A housemate once told her that plants really bring a good atmosphere into the room. But, as she admits herself, she was too lazy to give them water, so now she got fake plants.

Text by: Charlotte Nijman

DILEMMA 2

Your butt crack proceeds until your neck	You have to brush your teeth every day with filet americain
Anouk Charlotte Linda	Aurel

Presentation War Stories

My first international conference was in Weimar. That city, one of the most cultural cities in Europe, was then, in 1978, located in the German Democratic Republic (abbreviated in Dutch as DDR). Only three western people were allowed to visit that conference, all other participants were from Eastern-European countries, most from DDR and Soviet Union.

At that time, almost no one in Eastern-Europe was able to speak English. I was told beforehand that I could give my presentation in English and that an interpreter would translate it into German. Just before the seminar the interpreter asked me for my notes because, she said, her English was not that good, so she could read from my text. This also implied that I had to follow my text sentence by sentence by heart. After the presentation, which went of course rather slowly, there was one question in German, which to the surprise of the audience and the interpreter I immediately answered in German before the interpreter was translating the question into English. After all I should have given my presentation in German, who cares. All other presentations were in German or Russian. One of the East Germans I met during that conference is still a good friend of me and we visit each other once in a while.

Also in 1978, together with my scientific brother (see my previous columns) Gerard van der Laan, I visited the USA (for the first time, a visa was still needed) to attend a conference in Milwaukee. Our flight was to Chicago, where we would stay for one night in the suburb Evanston, our destination after the conference, because our main supervisor lectured there at Northwestern University. The KLM plane was overbooked, but we could travel via New York JFK. When we arrived in Chicago we could not get our luggage (as customs was already closed), it was hard to get a cab (too far so late) and when we arrived in the hotel late midnight, we were told we were too late, and there was no longer a room available. Luckily, we could call our host and he arranged another hotel. After a few hours of sleep, we got into a small car with five people, first to the airport to pick up our luggage, and then to Milwaukee, where we arrived just on time to give the worst presentation we have ever given, as you can imagine.

There are two other presentations I will also never forget. One was in 1985 at Princeton University. At that time John F. Nash, you (should) know him, also from "A beautiful mind", was still ill, but when my host, Harold Kuhn, spotted Nash, sitting on the same bench I saw him four years before, he told him that there would be a seminar on the computation of Nash equilibria at 4 pm. Nash responded with "I forgot my glasses". However, he was present at my seminar (without glasses), together with Kuhn and Alan Tucker, indeed you know them.

Another for me very memorable presentation I gave in October 1996 at Yale University in honor of the 65th birthday of Herbert Scarf, with whom I stayed for one year as visiting lecturer after I got my PhD and before I came to Tilburg, see my previous columns. I was invited to give a seminar for 45 minutes, but because the next speaker, B. Curtis Eaves from Stanford, was not well prepared enough, I was asked to give a double-seminar. I knew there would be nine blackboards in the lecture room. I used all nine blackboards completely, without erasing anything, all by heart, and in front of five Nobel Prize winners…

'I used all nine blackboards completely, without erasing anything, all by heart, and in front of five Nobel Prize winners…'

Dolf Talman

Dolf Talman is professor of Game Theory and Equilibrium Programming at Tilburg University (TiSEM) and CentER. His expertise is the development, to prove existence and the computation of equilibria in economic and game theoretic models.

Artificial Intelligence FOR DUMMIES

Text by: Thomas van Manen

Last Nekst, Ennia gave us all an introduction to machine learning. This time, we are going to look at a closely related field (or buzzword?): artificial intelligence (AI). On the daily you see tons of news items related to AI, ranging from self-driving cars to negotiating robots. But how does it relate to other fields like Machine or Deep learning? What are the dangers? This and more in AI for Dummies!

To get a better understanding of what the hype around AI entails, a good starting point would be to look at a formal definition. Wikipedia describes it as: *Artificial Intelligence is intelligent behavior by machines, rather than natural or organic intelligence of humans or other animals. (…) Any device or algorithm that perceives its environment and takes action that maximizes its chance of success at some goal.* We saw last Nekst that machine learning could be a field where machines are able to learn specific tasks or patterns by means of data. Therefore, you could say that machine learning is the process of learning intelligent behavior (i.e. artificial intelligence) by means of data.

Checkers and threats

The birth of AI is generally accepted to be in 1956, when a professor from Dartmouth College decided to organize a conference to clarify and develop ideas on thinking machines. He dubbed this field artificial intelligence. Originating from ideas put forward during this conference, numerous brilliant programs were created. Computers were able to learn checkers strategies, prove theorems, or even speak English. It went so well that by the middle of the sixties, the founders of AI predicted that within twenty years, a computer would be able to do any work a man can do.

However, this prediction turned out to be far too generous, as in the seventies people learned that some tasks may be more difficult for AI than others. The toy problems AI had been dealing so far, with such as checkers were still incomparable to the grand real-world problems. Critics were very eager to point his out. This slowed down progress, and in 1974 in response to these critics and pressure from politics, most of the funding for AI was cut off in the UK and the USA. This period would come to be known as the AI winter, where getting funding for AI was near impossible.

In the years that followed, AI experienced more downfalls, but also successes. A famous example is the Deep Blue computer. It was the first computer that was able to beat a world class chess champion, Garry Kasparov, in 1997. In recent years, AI has gained enormous boosts due to the access to huge amounts of data, faster computers and more advanced statistical techniques. This has led to many cool applications of AI, some of which you can read about later in this article. →

However, the developments of AI have also led to critics that fear the potential of AI. These critics have been there since the very beginning of AI. A famous example is the film: 2001: A Space Odyssey, where the intelligent computer HAL 9000 decides to kill the people that try to shut him down, because they would hinder his programmed objectives.

These fears are not only a thing from the past. These days there are also critics pointing out the dangers of AI, the most famous one being the entrepreneur Elon Musk. He is a stern advocate of regulating AI as soon as possible, and has compared work on AI to "summoning the demon". He fears that we will only realize the importance of regulation when robots go down the street killing everyone, at which point we would be way too late.

From science-fiction to reality

The kind of AI Elon Musk fears is only one of two kinds of AI. The one he fears is called general AI or strong AI. It refers to AI capable of performing general intelligent actions. Some definitions even state that for strong AI, machines should experience consciousness. It describes AI that is not specifically programmed for one action. This is the kind of AI that the founders of AI envisioned, but turned out to be very difficult to achieve. There are various criteria to determine whether a certain AI application can be called a strong AI. A famous criterium which Ennia explained last Nekst is the Turing test. However, there are many (funny) tests: one example is that a machine with strong AI should be able to enter an average home and be able to make a cup of coffee using the tools available in the home. Another one is that a machine with strong AI should be able to enroll in a university program and obtain the same degree a human would obtain.

Elon Musk: 'We will only realize the importance of regulation when robots go down the street killing everyone'

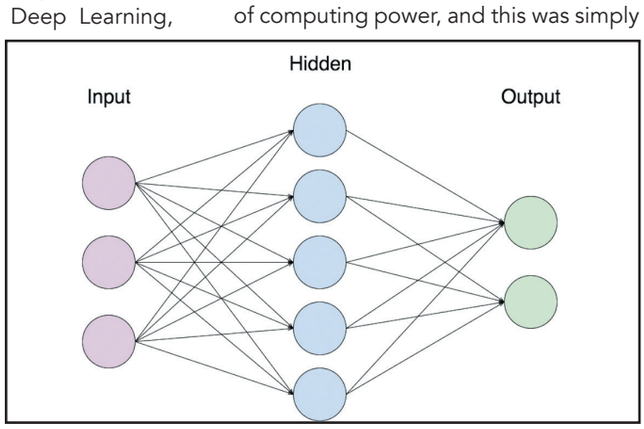
To this day, this kind of AI has only appeared in science-fiction films like The Matrix and iRobot. However, the other kind of AI, weak AI, is definitely a present-day reality. Weak AI is AI that is focused on one narrow task. A well-known example of narrow AI are personal assistants like Siri or Google Assistant. While these assistants seem to operate with some intelligence, they are very fixed to certain tasks an assistant would do, such as checking the weather, or making an appointment in your agenda. Siri would not be able to make you a cup of coffee or obtain a degree.

Deep Learning, the magic behind it all?

A lot of the cutting-edge AI examples we will see relies on Machine Learning. It mostly relies on one specific part of Machine Learning: Deep Learning. Deep Learning is one of these terms that received tons of hype over the past years. To get to Deep Learning, we would first need to take a step back. From the beginning of Machine Learning an algorithm called an Artificial Neural Network (ANN) had existed. ANNs are inspired by our understanding of the brain; an immense number of neurons that are all interconnected.

You might, for instance, take an image, cut this image into tiles, and feed each of these tiles to the first layer of the ANN, the input layer. These neurons then pass the data to the second layer of neurons. This layer does its operations, and so forth, until the final layer, the output layer, is reached. Each neuron gives a weight to its input, and by combining all those weight a final output can be made.

However, until recently, implementing these ANNs seemed to be downright impossible. To be able to build even the simplest of an ANN, you would need a lot of computing power, and this was simply



not available. Also, the ANN needs to be fed with a lot of data. If you would want to classify, for instance, a cat in a picture, you would need preferably hundreds of thousands of pictures of cats to get the correct weights on the neurons, resulting in a correct classification.

The next step is taking these ANNs, and making them huge, so increasing the number of layers and neurons the data needs to be fed through. This requires tons of data, as well as a lot of computing power. This is what is called Deep Learning and lies at the foundation of most of the cutting-edge AI that is currently being developed.

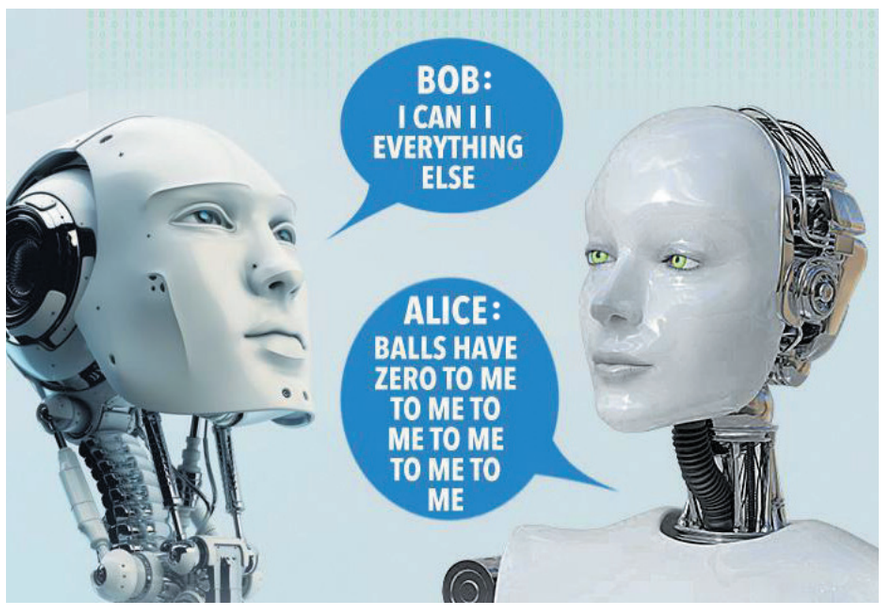
To conclude: AI has made tremendous strides in the last few years. With the possibilities of modern computing power and the resulting rise of Deep Learning, AI may finally be able to get to the state envisioned by science-fictions movies. While there is of course the doom scenario of robots taking over the world, I am mostly excited to have a C-3PO at my doorstep soon!

EXAMPLES

Negotiating chatbots

Recently, Facebook designed two chatbots, Alice and Bob, to negotiate with each other. A couple of mind-boggling results came from this. The first remarkable thing is that the bots seemed to be quite skilled at deal making. For instance, they were able to feign interest in something that had no value to the bot, only to be able to give it up later as a "compromise". Basically, they taught themselves to lie. However, the most bizarre result was that the bots seemed to start very weird conversations like:
Bob: "I can I I everything else."
Alice: "Balls have zero to me to me to me to me to me to me"

To make the negotiation process more smooth, they diverted to their own brand-new language! This happened without any input from the supervisors. Since the goal of this research was to create bots that could communicate with actual humans, this project was unfortunately shut down after this. →



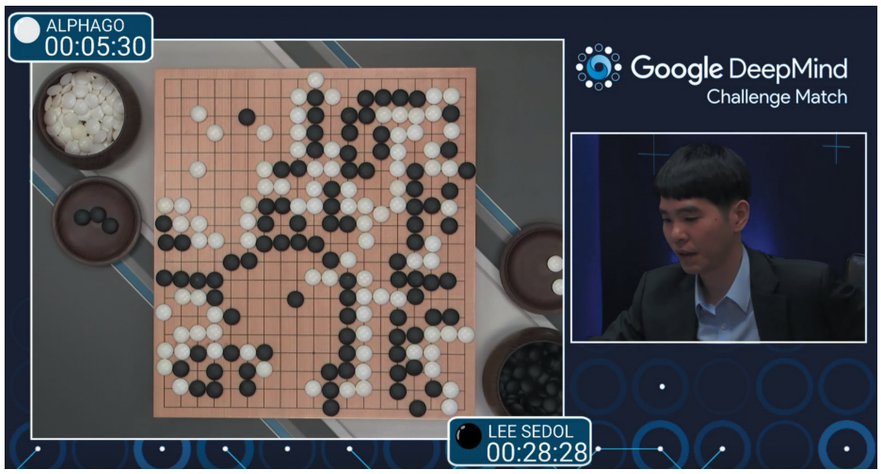
'They diverted to their own brand-new language (...) without any input from the supervisors'

DeepMind AlphaGo Zero

While computers have beaten the best in games like checkers or chess a long time ago, for the ancient Chinese game of Go this had been an unachievable task until recently. Since the number of scenarios at each point in the game is a lot higher in Go than in checkers or chess, it is a lot harder for a computer. One game of Go can have more possible outcomes than there are atoms in the universe. What makes the DeepMind AlphaGo Zero so special is that it uses a completely different way to learn the game. Previous versions of AlphaGo developed its strategies by training on millions of moves from previously played games by professionals. AlphaGo Zero does not use any data from previous real games. Instead, DeepMind simply gives the rules of Go to the algorithm, and the algorithm then figures out optimal strategies by playing versus itself. This technique is called reinforcement learning.

Walking AI

Another example from our friends at DeepMind. One of the fields of intelligence is physical intelligence, for instance a football player being able to dodge a slide tackle, or a monkey swinging through trees. It basically consists of being able to move throughout a complex and changing environment. DeepMind developed AI that is able to "walk" given only the simplest of directives. They simulate agents with certain bodies, for instance, a blob with two legs, and give only the objective to move forward without falling. Given these very simple instructions, the agents learned complex skills such as jumping or climbing to move forward.
For a short film showing the walking robots, go to:
https://www.youtube.com/watch?v=gn4nRCC9TwQ



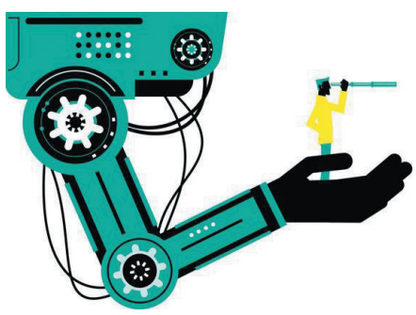
If you want to learn more, go to:
https://deepmind.com/blog/alphago-zero-learning-scratch/

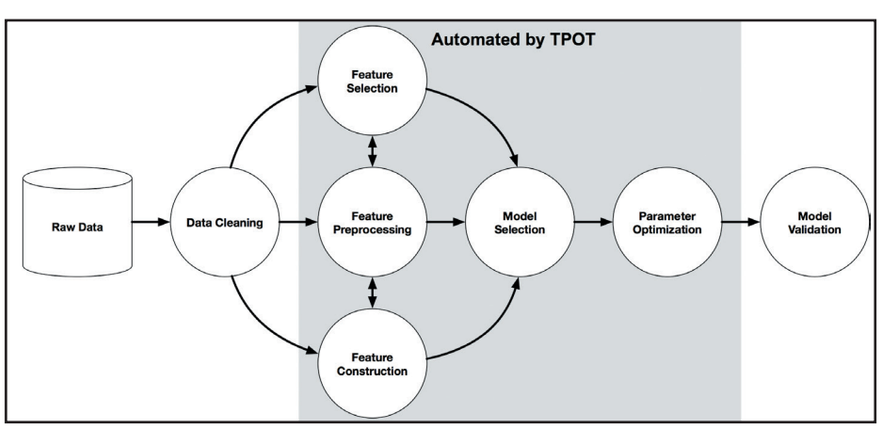
'DeepMind simply gives the rules of Go to the algorithm, and the algorithm then figures out optimal strategies by playing versus itself'

Automated Machine Learning

Over the past few years, a lot of companies have implemented Machine Learning in their daily businesses to optimize all sorts of processes, such as customer targeting, optimal pricing, or recommending certain products. However, choosing the correct algorithm to perform such a task can be very hard for a Data Scientist. Without the proper experience, and even with that experience, it might take a lot of time. Given that the number of Data Scientists is limited, Automated Machine Learning solves this problem by automatically preprocessing the data, selecting various features, choosing the best model, and then selecting the best hyperparameters for this model.

With Automated Machine Learning, smaller companies that are not able to hire an entire data science department are still able to obtain relevant insights, by using AI to select the correct data science "pipeline". ●





Predicting the Outcome of Elections

At CentERdata, the institute for data collection and applied economic research, we had never been involved in the many polls that pop up in the period towards elections. That is, until the 2017 Dutch parliamentary election. Before, we felt that interfering in the daily debate of who is winning and who is losing did not contribute to either society or science. Last year our opinion changed, inspired by a new method that was used by the Center for Economic and Social Research at the University of Southern California.

This method turned out to be quite successful in predicting how Americans would be voting in November 2016: for Donald Trump or Hillary Clinton. It did become a scientifically interesting challenge: a scientific experiment to examine the performance of an alternative method was born.

Traditionally, election polls ask for which party one would vote if (parliamentary) elections were held today. The respondent can then select one of the listed parties. This may be problematic in case you are still uncertain on what to vote and leave your options open. In the alternative method respondents are asked to give the percent chance that one would vote for each of the listed parties (if parliamentary elections were held today). The total probabilities should add up to 100%. And before answering this question, the respondent was also asked the probability that he or she would vote at all.

Next to the different method of asking we also used a specific and unique sample for this study: members of the LISS panel. As I explained in my previous column, this panel deviates from the usual online panels in the sense that the panel is not based on a self-selected sample but on a random sample drawn from the population register by Statistics Netherlands. In addition, households that could not otherwise participate are provided with the necessary equipment, such as a computer and/or broadband connection. The panel that was used in the United States for the election poll is similar on these aspects.

There are many more details I could share with you, but a column has a limited number of words and I guess the only thing you are curious about is the outcome. Did the alternative method perform better than the method used by the commercial pollsters? Long story short: 'no' and 'yes'. Our predictions were not closest to the actual votes. That may sound disappointing, but actually here also science starts (again) because one wants to know why. One of the reasons is that we followed the design that was also used by the US research team. Data collection was done on a daily basis (rotating groups) and the predictions were calculated as the average of all of the prior week's responses. In case voters doubt until the last moment – which is definitely the case, perfectly shown by the alternative probability questions – then crucial events prior to the day of elections may have a large impact. And that is what happened: the diplomatic crisis between Turkey and the Netherlands during the weekend before Election Day had most probably changed opinions, at least for a part of the voting population. Our running average gave insufficient weight to this event.

But there were also positive results from using the alternative method. Jochem de Bresser and Arthur van Soest, both affiliated to the department of Econometrics, analyzed the data and found clear evidence that at the level of the individual, subjective probabilities are substantially better predictors of actual voting than deterministic statements. They also analyzed whether this consistently hold for the entire sample, and found substantial heterogeneity in the predictive power: the alternative method works better for those with higher probability numeracy.

Want to analyze the data yourself, looking for other (different) patterns? The data are freely available in the LISS Data Archive (*https://www.dataarchive.lissdata.nl/*). You may also visit the website *https://verkiezingen.lissdata.nl/* for more information. I am curious whether you find interesting and other insights. And maybe you will come up with an even better way of predicting the outcome of elections!

'In case voters doubt until the last moment, then crucial events prior to the day of elections may have a large impact'

Marcel Das

Marcel Das is the director of CentERdata and professor of Econometrics and Data Collection at the department of Econometrics and OR.

Jheronimus Academy of Data Science, Nice to meet You

On a drowsy Thursday morning Max van der Lee and I took the train to Den Bosch to pay a visit to the Mariënburg, the location of the Jheronimus Academy of Data Science (JADS). As probably not many of you know, this is the new location of the master's program Data Science & Entrepreneurship: a master's program that is directly accessible for any student with an econometrics bachelor degree. To find out what this master's program entails, we spoke with the program director: professor Willem-Jan van den Heuvel.

Text by: Thomas van Manen

Willem-Jan van den Heuvel

Prof. Van den Heuvel is affiliated with TiSEM as he used to be the program director for the Master Information Management. He is specialized in distributed systems, and originally used to work with very large databases. He first heard of the initiative through the well-known professor Dick den Hertog, so you could say that he was involved since the birth of this new program.

To find the origins of the JADS we have to go back in time by a few years. It started with conversations between the former dean of Mathematics and Informatics in Eindhoven, our current rector Emile Aarts, the dean of TiSEM, Lex Meijdam, and the former dean of TLS, Corien Prins, to start a new cooperation between Tilburg University and the TU Eindhoven regarding Data Science.

Contrary to what you may think, JADS is not solely located at the new campus in Den Bosch. JADS can be found at three campuses, the TU Eindhoven, Tilburg University, and Den Bosch. It consists of multiple master's such as Data Science & Engineering in Eindhoven, Data Science & Governance in Tilburg, but also the econometrics Master Business Analytics & Operations Research. However, all these master's programs focus solely on one discipline. The main difference between the new Master Data Science & Entrepreneurship and the previous mentioned master's programs is that it is multidisciplinary.

Data Science & Entrepreneurship

Professor Van den Heuvel explains the philosophy behind the program as follows: Tilburg University focusses on understanding society and on contemplative studies. It looks at society, economic developments and data, and tries to increase the understanding and the knowledge about it. The TU Eindhoven on the other hand, focusses on creating and building solutions, and engineering. The idea of JADS and of the Master Data Science & Entrepreneurship is to combine these goals. This results in the following process: finding problems in society and issues companies run into, and then build solutions for these problems. After these solutions are built, they are validated and tested on new, similar problems.

The program is a two-year program, is a beta studies, and focusses (as the name suggests) on Data Science and Entrepreneurship. The program consists

of four pillars, where the main focus is on the first two mentioned hereafter. The first one is data engineering: what are data pools and data lakes and how do you connect to these with Hadoop or Spark. What is an Apache data stack, how do you program in Python. This pillar really focusses on bringing solutions into production. "Very important, if you want to bring anything to market as an entrepreneur", states Prof. Van den Heuvel.

Prof. Van den Heuvel gives is Philips. Philips is way past the days of earning their money on light bulbs or LEDs. They need innovative ways to make use of the data these devices provide. For instance, determining the occupancy rate of an office by measuring the total time lights are on, and determining the cleaning frequency with this data. Or in health care, checking whether someone has been sitting still for too long, and sending out an alert when someone has not moved in a while.

'There is also extensive personal guidance by means of a skill journey'

The second pillar is (data) analysis. How to increase your understanding of a problem by means of data? This could be by means of traditional statistical or mathematical methods, but also newer methods such as deep learning, machine learning and artificial intelligence are used.

The third one is entrepreneurship. It focusses on showing the new data driven business models. Many companies such as banks and insurance companies are very aware that the world is changing, and are trying their best to adapt to this. One of the means for this is data. An example

The final pillar is ethics: what are the ethical implications of the use of data science? The goal of the program is not to deliver data engineers or data scientists, but to deliver data entrepreneurs. This means that you should also be aware of the possible implications of your enterprise on society, and whether this implication is desirable. For instance, you might be able to make a great data driven dating site, and try to incorporate things like LinkedIn and Facebook data to find someone's perfect match, but whether this is desirable privacy-wise is debatable.

The program is quite intensive. All courses are taught by two different teachers, and all subjects should make use of datasets. A semester consists of 5 courses with 3 hours of lectures and 3 hours of tutorials per course per week, so quite a lot more than the average Tilburg University master's program. There is also extensive personal guidance by means of a skill journey. These skills are not the traditional writing or presenting skills, but skills like leadership, negotiating, persuading or creativity. There are trainers and individual assessments to develop your own skills. There are also mentors that already work in the business sector and people that can give you advise on finance or legal issues if you want to start your own enterprise.

Connection with econometrics

The program is directly accessible for anyone with a bachelor's in econometrics. As a matter of fact, Prof. Van den Heuvel states: "The program was designed with an econometrics background in mind". However, currently in information sessions in Tilburg a wide plethora of students is present, ranging from IBA to Information Management to HBO students, but very few econometrics students, while from Tilburg only econometricians can →

access the program without following a pre-master's. The program is also directly accessible for people who study mathematics, computer science or the new bachelor Data Science (that is also taught in Den Bosch).

Application in business

There is a lot of interest from various companies in JADS. There will be companies that have their offices on the new campus, such as various governmental organizations, and the innovation platform of the Dutch police. This makes it very easy to have (informal) contact with these companies, as they will work and have lunch in the same place as the students. Next year, the JADS association will start, enabling companies to provide students with master classes, executive teaching, hackathons, you name it. In exchange companies could provide data or work together for initiatives like joint ventures.

Therefore, the focus is mainly on academics that value the importance of societal relevance in research. Fundamental research on for instance new algorithms for which the goal is not known will not be the focus. This research is more suited to the universities in Tilburg or Eindhoven. In Den Bosch, the focus will be on research that directly impacts the society. That does not only mean publishing papers on it, but also providing solutions for problems, such as reducing the number of traffic incidents, increasing sustainability, or any societal problem.

Future

Prof. Van den Heuvel thinks Tilburg University and the TU Eindhoven can be quite content with the JADS in Den Bosch. There are currently roughly fifty students enrolled in the new program, and they hope this will increase to roughly one hundred students. The renovation of the Mariënburg is progressing as planned. Some people tend to be cynical of the Mariënburg, as they see it as a separate institute with a lot of money - a fortress in Den Bosch - but Van den Heuvel stresses that this is certainly not the case. It is a place where both universities have an equal part, that is incredibly open, where anyone can enter. It is a small campus, but has his own charms, and inspires people to come up with creative and innovative ideas.

In the future, the goal of the JADS is to become the leading think tank in the field of data science and entrepreneurship where cutting edge technology meets entrepreneurship, and the education is of a high standard. By combining the strengths of the TU Eindhoven and Tilburg University, more impact can be created than by operating separately. To meet these goals, it is very important to get more research capacity, and to obtain sufficient funds. Without this it can still be a great institute, but these goals will not be attainable.

Altogether, we can conclude that a great new program started in Den Bosch this year, which is perfectly tailored to the econometrician that not only wants to see the theoretical side of data science, but also wants to put this knowledge into practice. We would very much like to thank Prof. Van den Heuvel for these valuable insights!

Three courses that describe the program

Data entrepreneurship in action:

Students get to work on real data provided by companies or the government. This data is raw, so no preprocessing, and could be real-time, coming from things like lamps or traffic. The goal is to create new insights that create added value, both monetary and societal. Examples are a wildlife project to protect the rhino in a park in South-Africa, or predicting illegal activities regarding drugs trade in Tilburg. The goal is to get to prescriptive analytics, so describing an action to improve a process.

Data Engineering:

Teach students various methods and tools that are a stepping stone to the modern technology. Concretely, this means getting to work with things like Hadoop MapReduce and Spark. Learning how to receive data from devices, curating data, and testing whether data has the correct quality. Data sets used for example Twitter feeds from the Twitter API, or real-time traffic data from London. Engineering is vital, as it is usually roughly 80% of the total project.

Deep Learning:

This subject is very popular, as it is currently a very hyped subject, by research such as DeepMind, beating the best Go-player in the world. Applications here are image processing, video processing and text processing.

The Master Data Science and Entrepreneurship is the latest addition to the innovative collection of econometrics-related master's programs offered by Tilburg University. Three of those are taught at the campus in Tilburg, as most of you will know. To elaborate on these master's, and distinguish them from the new program in Den Bosch, we provide a short description of these programs.

Text by: Loes van der Linden

Business Analytics and Operations Research (BAOR)

BAOR is the abbreviation of the Master Business Analytics and Operations Research. This master's program is actually really young, only two years ago Business Analytics was added. Nowadays, big data is a hot topic since the world's data doubles every 1.5 years. During the BAOR master's program, you learn to make smarter decisions for businesses using this data and math. The big difference with the data science program is that the focus there is on applying data science to businesses whereas in the BAOR program the focus is more on data science itself. The Master BAOR teaches you to choose the right method to use to solve complex business problems. Around 30 to 40% of the problems that you solve with the BAOR program will be an application in logistics. Because of the high standards of the master thesis and the extensive company network of the program, there will be enough job opportunities. Examples are: consultant, management support, application providers and research.

Econometrics and Mathematical Economics (EME)

EME is the abbreviation for the Master Econometrics and Mathematical Economics. The Master program currently has more than 40 students, of which 50 percent are female and 40 percent are international. Our students are very happy with this program, currently rating it at 4.6 out of maximum 5. Since 2016, the master's program has a stronger applied focus, geared towards solving real world problems and developing policy recommendations that directly shape businesses and our society. As part of this reform, two new courses that teach the foundation of economic modelling were introduced.

In contrast to the BAOR master's program, the Master Econometrics and Mathematical Economics has a strong focus on economics. During this master, you will learn to develop new economic models, take them to the data with state of the art econometrics models, and make policy recommendations for both the private and the public sector. Students learn how to design welfare policies, health care products, capital investments, as well as how to regulate competition and recommend strategic economic behaviour for firms. Typical first jobs after the EME Master are: economic analyst, consultant and data scientist.

Quantitative Finance and Actuarial Science (QFAS)

QFAS is the abbreviation for the Master Quantitative Finance and Actuarial Science. The program received the special recognition of "Topopleiding" in the Dutch Keuzegids 2018. Because the fields of quantitative finance and insurance are becoming more and more intertwined, the QFAS program focusses on generic models for quantifying and managing a broad range of complex risks, ranging from financial risks to insurance risks, and anything in between. Guest lectures and "real-life" assignments give students a good insight in the practice, and the writing of a master's thesis in combination with an internship is encouraged.

Because of the broad focus of the program, graduates can take up a variety of tasks, ranging from pricing and hedging complex financial or insurance risk, to optimizing investment strategies for large and small traders, or evaluating regulatory requirements for financial institutions, insurance companies and pension funds. Employers are typically impressed by the knowledge and skills of Tilburg QFAS graduates, not only because they know a broad range of advanced models and methods but also because they have developed the strong practical skills needed to successfully implement these models and methods in practice. Alumni of the master's program in Quantitative Finance and Actuarial Science work, for example, as risk management consultants, asset managers, actuaries, and investment analysts at banks, insurance companies, pension funds, consulting agencies, trading firms, and government bodies. The career prospects are excellent; most students have a job immediately after (and often even before) graduating. The program is also an ideal stepping stone to start the executive master's in Actuarial Science, which leads to the official title of Actuary AG.

Quantics: Conquering the World of Quantitative Consultancy

On a typical, not too cold blue Monday, Anouk Verhagen and I traveled to a fairytale-like estate in the peripheral area of North-Brabant's beloved capital. Upon arrival, we traded our state of ultimate comfort in the seats of our grey Opel Corsa, a true piece of Germany's finest engineering and craftsmanship, for a short walk over typical parking lot gravel. We were about to find out more about a young, dynamic company and how they use the best the Netherlands have to offer in order to serve their clients and achieve great results.

Text by: Dominique Bavelaar

With "the best" I mean econometricians, just like you are. Tom Luijten is an econometrician from Tilburg University as well and he took the time to give us an insight in his daily life at Quantics and what the company has to offer. Tom graduated last year and within two weeks after graduation, he entered Quantics: "I did the *Operations Research and Management Science* master's (the old name of BAOR) and after my studies, I got into contact with Dorien de Boer, who is the founder of Quantics. Though I did the ORMS master's, I was not really convinced that I wanted my job to be only covering topics in that field," Tom explains. "For example, I also liked subjects like Life Insurance, so I wanted to have some diversity in the projects I would do and a somewhat broader set of responsibilities."

This is exactly what Dorien could offer Tom. His job title is *Junior consultant* and, even though that title may suggest otherwise, he is granted a lot of freedom and responsibilities to let his talents flourish, and the company with it. Quantics offers its employees the opportunity to take trainings and (online) courses in various topics. Tom: "The first few weeks after I joined Quantics, I took a lot of those courses in order to refresh and extend my knowledge". And these were not only the *soft skills* or *management* trainings a lot of other companies offer as well: "I also followed programs which dive deeper into topics I came across with during my studies as well, like machine learning and data science." This kind of trainings can be offered, because every single employee in this company is an econometrician, except for Dorien. This makes it very easy to share knowledge among each other and the consultants can advise each other in an efficient way, since they have a shared language. Quantics is also quite a small company with only seven fulltime employees, so you can really make an impact right from the start of your career. Of the seven employees, there are six econometricians, one of which, *the senior*, has a lot of experience; the rest is about Toms age.

As usual in similar Nekst articles, we also asked what a typical day at Quantics looks like and as expected we get the answer that there is not such a thing as a "typical day", but Tom tries his best to tell enough about his job until we make a satisfied impression: "The work you do really depends on the project

‘We have the expertise companies need for projects involving a huge amount of data’

Tom Luijten

Age:
25

Job Title:
Junior Consultant

Education:
Operations Research and Management Science

Dorien de Boer

Age:
35

Job Title:
Partner

Education:
Human Resource Management

you are working on. Currently I am doing a project at ING, where I monitor and analyze market risks in the bank’s trading portfolio, using data science methods. For this, I work at their office in Amsterdam in a team with guys from all over the world and from all kind of backgrounds. From econometrics and physics to finance or economics. Most of the time I work together with the more quantitative guys, but it is important to also be able to explain your solutions to the rest of the team and the management.” A bank like ING is, indeed my dear critical reader, not the kind of company you would expect to find an ORMS graduate enjoying his lunch and work. Tom: “The fact that the projects at Quantics are so diverse is something I really like. I still use the techniques and knowledge I obtained during my studies, but I am able to apply them here in a lot of different fields. A colleague of mine is, for example, now working an optimal operational strategy for car lease company Athlon.”

Quantics also asks you, as soon as you are employed, what other kind of responsibilities you would like to have next to your consultancy projects. For example, Tom manages the company website, even though he did not have any clue about web design whatsoever before entering Quantics: “You learn new skills really fast since you start your first project right after the training phase,” Tom elaborates, “There is continuous feedback from and between other consultants, so if someone gets stuck, we can help each other out as well.”

‘You should not be afraid to speak up and ‘sell’ your solution’

Quantics’ employees work 90% of the project duration on location, in Tom’s case the ING office in Amsterdam. Two days a month Quantics consultants have an *office day* on which they all meet each other on the castle office, which is located in Vught, in order to share their experiences. And now I hear you thinking: Well, well, well, that all sounds nice and stuff, but traveling from Amsterdam to a castle in Vught is quite hard by train, right? Not the slightest problem for Tom and his colleagues, since they get a car from the company. This also means that it is not necessary move temporarily to an expensive city like Amsterdam, in case you should have to work there for a while. Tom, for example, lives in a moderately big town near Breda with his girlfriend.

Sounds nice again, but how should a small young firm like Quantics be able to compete with huge players in the consultancy field? Tom: “It is true that big companies often have contracts with the larger consultancy firms about provided services. However, since Quantics offers a really quantitatively orientated collection of econometric specialists, we have the expertise they need for projects involving a huge amounts of data.” That is also why Quantics gets more and more project requests, for which they also need more manpower. However, they aim to grow responsibly and the new employees they hire should fit in the team and company: “We do not want more than say 30 consultants in the company, but it is hard to put an exact number to this,” Tom explains, “We want to remain a small and close team in which everyone knows each other well. The consultants we want should have a basic talent for explaining complex solutions in an understandable way to our clients. Of course, you learn the *soft skills* you need for this along the way, but you should not be afraid to speak up and ‘sell’ your solution.”

Data science with a quantitative, human twist within a company with high, yet realistic ambitions, that is what Quantics can offer young econometricians. We would like to thank Tom for the time he took to give us a premium insight in what working at Quantics looks like. In case you want to know more about Quantics, do not hesitate to visit *quantics.nl*.

‘The fact that the projects at Quantics are so diverse is something I really like’

THE TEACHER

Econometrics, Ethics and More

On February 19 Dominique Bavelaar and I interviewed professor dr. Johan J. Graafland. We first asked him if he had something to share before the interview started. He wanted to think about it and at the end of the interview he stated that he really appreciates the input he gets during lectures from econometrics students. Well done all!

Text by: Zoë Connell

Johan is a professor for the Economics Department of Tilburg University. When he was attending high school, he did not know which field of study to choose. To figure this out, he took a test to see which study program it predicted would be the best fit for him. The result of this test was econometrics; a field of study he was not familiar with and in addition he did not choose the course economics during high school. He decided to talk with an econometrician to see what his life was all about and thought that the shoe almost fit, but something was missing. Later, he realized that he missed the social component in econometrics and hence chose to study economics. In the end he specialized in mathematical economics; a field quite close to econometrics.

When Johan was a teenager he had a few jobs such as bringing around newspapers, picking tomatoes during summer and one winter he stood behind the assembly line of a chicory nursery. As far as the newspapers and tomatoes go, he enjoyed these jobs and especially the latter was fun with friends during summer. However, working at the assembly line of the chicory nursery was horrible. He worked there for only one week, but every minute felt like an hour, so you can do the math how long that week really felt. He explained that the chicory would have to be taken out of the water, the rotten leaves had to be removed and then they had to be placed on the assembly line. One can imagine how mind-killing this job must have been, however Johan looks back at the period with a smile saying that everyone should experience different jobs in their lives, especially during your student life. After a couple of years of studying he became a student assistant for the Erasmus University in Rotterdam. He was not a student assistant that did administrative work, in contrast: he was already conducting research.

As Johan was working as a student assistant for 20 hours a week, he studied a bit longer. Only in his last year he began thinking about promoting. After graduating, he started working at the Central Planning Bureau (CPB hereafter). The firm really supported his studies and made it possible for him to work four days and work on his PhD project during the fifth day. As the subject of his promotion project, 'persistent unemployment, wages and hysteresis after the crisis of 1981', was a continuation of his master's thesis and it was really similar to his job at the CPB, he managed to finish his PhD thesis in only four years. At the time it was possible to publish different papers, and in the end bundle them together as the end product, this is not usual anymore. One paper was even written at CPB.

CPB did not only support him during his academic path, but they also made sure that it did not interfere with his career at the firm. When he finished his promotion project, he decided that he missed something in his field of work. In particular, he missed the philosophy of life (subjects as freedom and justice) and ethics in the field of economics. He was very interested in the norms and values related to economics. This subject was something he had always been interested in; his father was a preacher and taught him about religion and norms and values. From the age

Johan Graafland

Age:
57

At Tilburg University since:
2000

Specialization:
Philosophy and ethics of economics

of sixteen Johan became an active practitioner himself and started reading a lot of books on ethics and philosophy. In addition, when he was a student he was a member of two different Christian student parties. To fill the gap of what he was missing during his time at CPB, he decided to study theology part-time for seven years in Utrecht after completing his PhD. He states that theology was a combination of religion with philosophy. Whenever he had optional courses, he chose economic courses to really study the combination he was (and still is) so interested in. Luckily it was only four periods of five Saturdays each year, which made it easy to combine with his family (his oldest daughter was just born when he started studying theology). He still kept working at CPB for only four days during this period. Nevertheless, he became head of the division of Applied General Equilibrium Models.

We asked Johan how he made the change from four days at the CPB every week to fulltime professor. He said that when he graduated from his theology study, he was already so used to only working four days at CPB that he wanted to find something else to do on the fifth workday. He already met quite a few people that were already working at Tilburg University. One of them mentioned that a fulltime position was opening for a business ethics professor. He was not specialized in this exact field, but it shared common grounds with his background. Hence, he decided to apply for the position and was accepted. The people of the selection committee (of which some had positions in business) were well aware that his experience in business ethics was limited at that time and they arranged a position for him where he would work at the university for four days and the fifth working day he had a position in a company. This arrangement was in place for three years. The first year he was working for C&A and travelled all over the world to see every inch of the supply chain of the firm. When he was working for C&A he was actively working on corporate social responsibility (CSR) related topics. After his time at C&A, he was placed at the construction company Heijmans. He got really lucky, as he was working on an assignment related to business ethics when Heijmans got in the news for illegal cooperation in the construction sector (so-called construction fraud). He learned that it is hard to stay true to your ethics when all the firms around you do not do that and gain money from it. It was quite ironic that he was interviewing people from the top of the firm, whom were claiming that things went well only fourteen days before the news of the fraud was made public. A positive note was that business ethics was a hot topic all around just after the fraud case of Heijmans. After his time at Heijmans, he worked for two other companies, GITP and VNO-NCRW before working at the university full time as a professor and researcher.

The main lesson Johan learned during his time working for some firms was that the degree of responsibility of a firm is highly related to the context in which they operate (examples include the product/service they offer, the financial status of the firm and actions of other big players in the same field). The degree of ethical acts relies on this. An example of this point is C&A going through a hard time because of fierce competition, leading to severe budget cuts. That resulted in a higher workload for everyone as some people were laid off and because people already had too much to do, →

CSR is one of the things that people lost focus on (the priority is not high enough). When all is going well, people want to actively work on CSR, but during hard times people focus on the most important things and CSR is not one of them. Similarly, the construction fraud example written before shows this lesson well.

What about Johan's daily life?

Johan has four children between the ages of 19 and 26, he is married, he currently lives in Goud and travels by public transport to the university. His wife is a doctor. He aims to work a maximum of 50 hours a week, because his family life is equally important as his work. Of these 50 hours, roughly 20 hours are spent on teaching and 20 hours are spent conducting research. At the moment, he tries to spend more time on research, which he is conducting for Templeton. The aim is to answer the questions: 'Is the market economy conducive to human flourishing and what is the role of virtues in this relationship?' The project is interdisciplinary, combining philosophy, theology, interreligious sciences, economics and management sciences and uses literature as well as empirical research where econometric methods are used. A team of researchers is currently working on this project. For his own empirical part Johan uses several datasets, including one which he developed himself containing data of about 10,000 firms from twelve European countries that includes many small and medium sized enterprises (SMEs). One would think that the intrinsic motivation would be higher for SME firms than for large companies, but in the dataset that trend does not seem to exist. That could be related to the fact that bigger firms know that they have more impact, hence they feel more responsible.

He mainly teaches the subjects CSR, economic ethics, philosophy and theology related courses. This means that he teaches students of almost all schools of Tilburg University. In addition, he accompanies students during their thesis. He enjoys the master's theses the most, as these are more in-depth than the BSc theses. Mostly he accompanies students of the Master International Management and Master Economics. He states that the students of MSc. International Management are thinking in a more practical way and students of a bachelor's or master's in econometrics tend to think more in an academic/analytical way. However, he hopes to teach econometrics students that there is more than the models

they make and that norms and values have a big influence on everything they are trying to model and/or predict. They have to understand what they are doing and try to objectively judge if the assumptions that are made are correct. Last but not least, he hopes that his courses stimulate students to think about their own ambitions: what is my contribution to the society as an econometrician?

Johan would advise students to enrol in a PhD program if they want to enhance their own knowledge. It helps you develop research skills and it forces you to focus on one subject for a long period of time. He thinks that nowadays it is more difficult for students to be accepted for a PhD program and the students have to publish more than students had to in his time. In addition, the international context has changed, which lead to an increase in competition from all parts of the world. All in all, he does not know if he would recommend people to apply for a PhD position, but for him it was a very good decision and the freedom and variety of tasks a professor has really appeal to him.

I would like to share some fun facts about Johan; he founded a book club with his friends to talk about philosophical and religious topics a few years ago and they still come together every six weeks to discuss a book. If Johan had the choice, he would not trade his job for a job in the business world. There is no company that could get him even if they wanted to, because he knows that top-notch jobs take a lot of effort and stress and he does not want that. Other hobbies include tennis and hiking. Lastly, he and his wife try to eat vegetarian two times a week.

Johan has a few words for the students reading this article: Develop your talents and be enthusiastic about your job. Enjoy the fact that you have the chance to study, do not focus too much on your future career. Make sure to find a balance between your personal/social life and work. Think ahead; making a lot of money usually means putting a lot of effort in your work too. It is also important to spend time with your significant other and children. When money interferes with the balance you should have, it will not make you happier. Lastly, be careful when applying for your first job. Some students tend to think they will work hard for a couple of years and then lay low and start a family, however in reality it is really difficult to take a step back in salary.
Enjoy life!

Bert & Ernie Questions

✓ Bert	☐ Ernie
☐ Teaching	✓ Research
☐ Tilburg	✓ Gouda
✓ Wine	☐ Beer
☐ Fries	✓ Pancakes
☐ Mental calculation	✓ Using a calculator
✓ Economics	☐ Theology

Asset | Econometrics

Alpe D'HuZes

Follow our Boardies

https://deelnemers.opgevenisgeenoptie.nl/asseteconometrics

There is More than just Econometrics: meet Asset's Independent Chairman

As all of our readers will know, our association is formally named *Asset | Econometrics*. The latter word should ring a bell and speaks for itself, but 'Asset' in this context may be a little less familiar. A few weeks ago, I spoke with a lovely lady who was willing to explain me in detail what *Asset* is, how it functions and what she has to do with it. Her name is Lina Segers and she is this year's chairman of Asset.

Text by: Dominique Bavelaar

Lina Segers

Lina is 22 years old, brought up in Venlo and currently studying in Tilburg (of course). After finishing her bachelor's in Economics, she decided to do a board year before really starting a master's in finance. Before entering the general chair position, she was already an active - but not too active, she stresses member of Asset | Economics. After doing different kinds of committees, starting with the freshmen committee and ending up at Food for Thought, she felt like she was up for a challenge. This desire resulted ultimately in being responsible for the day-to-day business of an association which represents every single student of Tilburg University's economics and business faculty: Asset.

'I felt like I was up for a challenge'

Asset is divided into seven departments in a similar way as TiSEM is divided in departments. I already mentioned, for example, Asset | Economics besides the Econometrics version, but we also have Asset | Accounting & Finance as well as Asset | Marketing. In 2013, all study associations of TiSEM, like the *Tilburgse Econometristen Vereniging* ('is VET'), merged and were renamed in the style you came across earlier in this paragraph.

"And did Lina find the challenge she was seeking?", is what you may ask yourself by now. Yes, she did: In addition to the seven departmental chairmen, she fills the eighth seat in Asset's boardroom. The chairs residing in those chairs make up the General Board of Asset. Lina has the difficult task to let all these stubborn presidents with each having different, and sometimes non-overlapping, interests work together. This takes her at least 40 hours a week, excluding (in)formal obligations – September was the busiest month in that respect.

Lina: "Each department has its own board, consisting of five or six members. The tasks a board member performs depend, of course, on their

‘In addition to the seven departmental chairmen, I fill the eighth seat in Asset’s boardroom’

function, but they mainly concern affairs within the department. An exception to this is the chairman. He/she fills 50% of his time with departmental business, whereas the other 50% is spent on tasks regarding Asset in general.”

Asset’s General Board is occupied with, among others, managing company relations, guarding Asset’s treasury and determining and evaluating the association’s strategy. Each board member has his/her own responsibilities, just like the non-chairman board members work together in the departmental boards.

As said, Lina is responsible for all this working out nicely. If that is the case, then she spends the rest of her time on policy implementation and evaluation in cooperation with the university. One can hereby think of ways to attract students to both informal and formal activities and plans regarding study or career support. “Tilburg University pays a lot of attention to career orientation nowadays and Asset should also play a role in this.”, Lina says. “This means that most departments organize their own career events where students can also orientate themselves on the right master’s to choose. I also have meetings with the Management Team of TiSEM where I represent Asset and its interests.”

Question remains to what extent a “union of study associations” in which executive power is centralized works better than the “old” situation of independent associations. Lina: “The main advantage is that we can organize big events, like the Economic Business Weeks, more easily since we represent a huge amount of students. Because of the same reason, we can really have a say in university policies: we cannot be ignored.” It is, however, not all roses: “Since we have seven different departments, we sometimes have seven different opinions in the General Board room. This is sometimes quite difficult. However, since departments still have a lot of freedom in choosing their own policy, this (almost) never causes major conflicts.”

‘We can really have a say in university policies’

I would like to thank Lina for the time she took to give us an interesting insight in the functioning of an organization representing an entire faculty’s student population. I also asked her some Bert & Ernie questions, just because that is fun. You can find these below.

Bert & Ernie Questions

✓ Bert	Ernie
Venlo	✓ Tilburg
Listening	✓ Speaking
✓ Beer	Wine
Theory	✓ Practice
Marketing	✓ Finance
✓ Cinema	Theater
Word finder	✓ Sudoku

Mirror Piece

Academic education has been anglicizing for a long time and it looks like it is continuing to do so. This helps in giving it more international power and also attracts international students. Recently, however, there has been more and more discussion in the media whether the (over)-emphasis on internationalization is a problem for the academic education of the Dutch students. For instance, the University of Amsterdam has 1260 international subscriptions for their (fully English) psychology program, while there are only 600 spots available. This leads to a discussion about how many international students should be allowed, and the internationalization of programs in general. The origin of this whole discussion is the fact that more and more academic programs are given fully in English, partly to make the programs available for foreign students, but also to make the programs and the university more appealing for the business world.

Text by: Aurel Macias Minambres

The situation of our Econometrics and Operations Research program is no different. For a couple of years already, (part of the) lectures have been in English. In March 2006, Paul Adriaansen actually wrote a column on this topic, the general quality of English of both students and lecturers and the general internationalization question for Nekst. In this piece, Paul reflected on the English used by different lecturers and the fact that these lectures are given at the 'Universiteit van Tilburg', and not somewhere in the United Kingdom or Australia. He also reflected on the fact that Maastricht had a much more international image back then. In Tilburg, they still struggled with the internationalization. The university did not yet know which image they should uphold and which choices they should make. Actually, some prerequisite courses for English master's programs were only taught in Dutch back in the day. This was not exactly a desirable situation, as it essentially rejected foreign students from English programs.

Nowadays, some things have changed and some things have not. I at least do think the international character is fully integrated now. Nekst is now actually fully in English, contrary to the situation back when Paul wrote his column – it was one of the rare pieces in English back then. Some of the programs are fully in English now, too, including our Econometrics and Operations Research program. There are also a couple of programs at Tilburg University that are still offered only in Dutch. Also, there do not seem to be as many international students signing up for the Econometrics program in comparison to the percentage of international subscriptions at the psychology program at the UvA. The situation of the quality of English in general is hard to evaluate, and one can assume the situation has improved, but there is always room for improvement. In the following piece I will directly reflect on the column of Paul Adriaansen in more detail, talking about what has changed and what has not.

To bend or not to bend

If you pull this one off from that guy, then there is nothing on the hand." This is just an arbitrary example of some 'toe bending' use of the English language in a lecture at Tilburg University. It made me decide that this would be a nice topic for my column. I'm writing this column in English so all our fellow econometricians from abroad can read it too. Furthermore I was inspired by the English preface Maaike wrote in the previous Nekst and I decided to support the trend of internationalisation of the TEV. As you might know, English is not my native language. Therefore I apologise in advance for all the 'toe-bending' language on this page...

Text by: Paul Adriaansen

Is it not a strange thing to do, apologising for errors in the use of the English language? Maybe it is... At least I never heard one of my professors making apologies (although there would be reason enough for them to do so) Everyone that ever tried to learn a second language knows how difficult this is when you are not living in a country where this language is commonly used. I speak Dutch with my friends because I do not have friends that are native English speaking and that is exactly the reason why I will never speak English flawless. Is this my problem or the problem of my audience? →

2006

- **Sven Kramer wins his first Olympic medal at the Torino Winter Olympic Games**
- **Pluto is stripped of its official title of planet, and is demoted to dwarf planet**
- **Nobel Prize-winning economist Milton Friedman passes away**
- **The Human Genome Project publishes the last chromosome sequence, in Nature**

Dunglish, a Problem or an Overstatement?

"If you pull this one off from that guy, there is nothing on the hand." This is a quote from some lecture back in 2006, with which Paul Adriaansen started off his column. Such 'toe-bending' English, as he named it, is still heard sometimes, but mistakes of this order are made less frequent. Considering this, one can say the quality of English has improved in general.

Text by: Aurel Macias Minambres

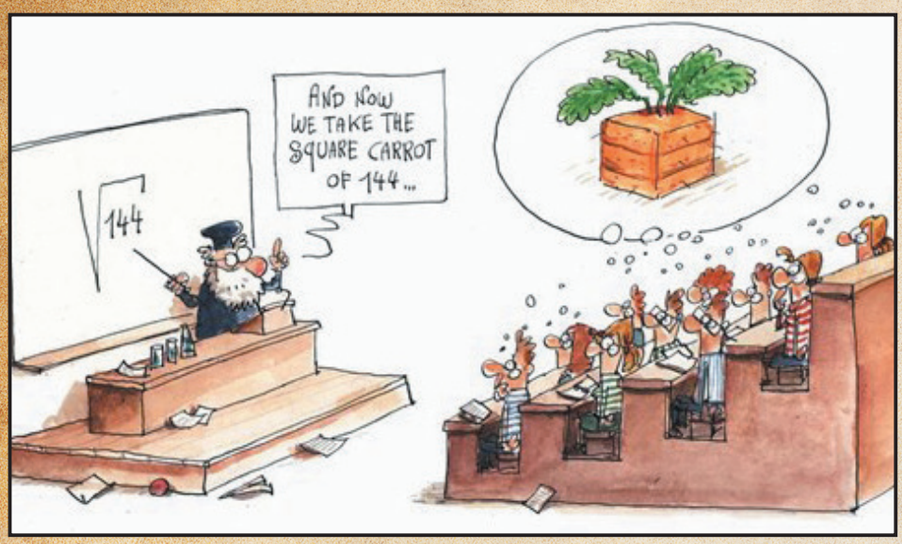
It still is not easy to learn English as a second language. However, should we really consider English purely as a second language anymore? People who were born in the nineties or later basically grew up with English since they were very little. With all the video games, movies and music they encounter, from early ages onwards, they tend to learn the language much easier, to a level where it becomes relatively close to a native language. In addition, much effort is put into learning the language at a very young age. Sometimes children start learning English in elementary school when they are only six years old. →

2018

- **Sven Kramer wins his fourth gold medal at the Pyeongchang Winter Olympic Games**
- **SpaceX launches their most powerful to date partially reusable rocket**
- **Stephen Hawking, often dubbed the greatest physicist of the 21 st century, passes away.**
- **Scientists in China report the creation of the first monkey clones using somatic cell nuclear transfer, named Zhong Zhong and Hua Hua**

Well, it would be my problem when I would study in the United States, for example. But I study at the 'Universiteit van Tilburg', which means that my professors and fellow students understand that a Dutch person will always commit errors in the use of English, as they do themselves. Perhaps it is a good idea to just accept this from each other...

On the other hand it would be too easy to just accept our English ignorance. Every semester lots of students subscribe for courses like 'English for the future' to become more skilled in writing and speaking in English. And that's exactly what should become compulsory for professors and lecturers at Tilburg University. When a university wants to create an international image, it should start with its own personnel. In Maastricht they understood that choosing for an international image cannot be realized with reluctant measures. In Maastricht every curriculum is fully taught in English, which is much more transparent then the indistinct system used in Tilburg.



This indistinct system sometimes even leads to excesses. I recently heard about a ridiculous incident that 'broke my wooden shoe'. There are international students that need to follow a pre-master's programme to be able to start with a master's in Econometrics. These students are paying high tuition fees to follow courses in Regression Analysis, Applied Linear Algebra, etcetera. All these courses are taught in Dutch, although they are compulsory for these pre-Master's students. Well, well, here's to our international image! What will these students think of Tilburg, being 'Europe's number one in economics'? →

The lecturers who are, more often than not, somewhat older, did not grew up with the English language like that. For them, this makes it harder to master the language in general. It is elementary that this induces mistakes or some kind of accents. I sometimes hear complaints about lecturers whose comprehension of the English language is a bit weak, but I do not see the problem if everyone can just understand what the lecturer says, be it in perfect English or a little bit broken English. In that sense, the situation is still the same. We are at 'Tilburg University' now, but it is still Tilburg, not Washington, Sydney or Oxford. I think we still should accept that some people just have a better command of English than others.

The only time when it can get tough is when a lecturer has significantly more problems explaining the subject matter in English than in Dutch (or another native language). Personally, I think that if a lecturer really feels this is the case, it would be helpful if they try and improve their English somewhat. However, they probably have other tasks to commit their invaluable time to, so acceptance should be the way to go if it does not sound necessary at all, in my view.

Nowadays, many curricula in Tilburg are fully taught in English. With some of them, you have the choice of a program in Dutch or a program in English. For Econometrics and Operations Research (EOR) and the corresponding master's programs, there is no such choice. One can attend Dutch lectures for some subjects in the first year of the bachelor's, but that is as far as Dutch lectures go. In general, the whole university has transformed to a more international look. Most signs and many information posts are in English. Nekst, itself, is →

So, on one hand Tilburg University and its professors need to reach a certain level in it's use of the English language and it should start with avoiding embarrassing failures as providing courses in Dutch that are followed by international students. On the other hand we need to accept from each other that our English will never become perfect, And we do not even want it to become perfect, because in that case we need to miss our amusing 'toe-benders'...

'All these pre-master courses are taught in Dutch, although they are compulsory for these pre-master's students. Well, well, here's to our international image!'

'Nowaday, many curricula in Tilburg are fully taught in English'

fully in English nowadays. In general, the language in which Asset | Econometrics communicates is English. It is only natural, considering the program is fully English, at least from the second year on. The fact that some lectures are in Dutch (in addition to the English lectures) in the first year is really just to create a smoother transition for the students.

This fully English program also attracts some international students. In my third year, I see around five of them, and considering the total of sixty students, I have no objections to this number, but it is also not that high. Now, econometrics is a specialized field which is only in the Netherlands a separate bachelor's program, which might contribute to this. At least it means that any Dutch student who wants to attend the EOR program in Tilburg can do so, so no UvA-esque shenanigans take place here. And the fact that the program is in English might be of value later in your career too. A little bit more international appeal for our EOR program would be fine. In my view there is enough room for Dutch students anyway (even though the number of first year students is steadily increasing by the year). On the other hand, I have heard of cases in my own first year where foreign students had a grave misinterpretation of what the studies are about. In general, they think (the first year of) our studies is based more around economics than mathematics. This misinterpretation is not even uncommon for Dutch freshmen, but because Econometrics and Operations Research as a bachelor's is something that is only seen in the Netherlands, this misinterpretation might be more common with international students. It is because of this that it is not easy to create awareness of the EOR program and especially the contents of it to future foreign students, while also not giving the wrong impression to these students.

In the end, the situation of internationalization in Tilburg and at our econometrics program has improved, while not making the situation worse for the Dutch students, by allowing for a transition phase and keeping in mind the number of international subscriptions. Maybe in the amount of international subscriptions, there is even some possibility to improve. The quality of English can always be improved, but it should be all right if everyone can understand the lecturer and the quality of the lectures will not go down by changing the language. We should just accept that everything cannot be perfect, and sometimes it can make for fun situations, too.

Promotion

Finance Expedition

Freshmen Weekend

Europe Trip

Active Members Day

Freshmen

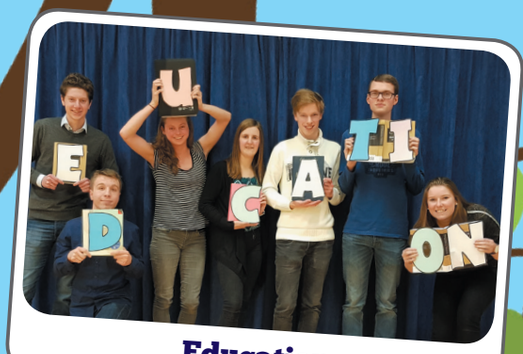
Strategy Tour

Wie is de Mol?

Business Dinner

Quantitative Investment Group

Yearbook



Education

Sports

Introduction Activity

EOR Academy

Lustrum

Landelijke Econometristendag

International Business Tour

Econometrics in Practice Day

Active Members Weekend

Anouk Claassen

AGE: 25

Began studies in 2011

A Semester Abroad in Budapest

August 21: the day I will not soon forget, the day my exchange semester in Budapest started. While walking through the security check, leaving two crying parents and a crying sister behind, I felt more than ready to start a new adventure. Are you curious about all the ins and outs of my semester abroad? Then continue reading.

Preparation and university

More than a year ago, I decided to prolong my student life with a semester abroad; a decision not everyone had expected. I was already a sixth year student and in the final part of my master's. Furthermore, I had already participated in several extracurricular activities; being an active member within several associations, secretary of the Asset I Econometrics board and doing an internship. Still I thought I could develop myself in a different way during a semester abroad. By starting a new life in a totally different environment, you will face all kind of challenges you will not face at home. For example, I found out that screaming to a general practitioner in English will not solve any of your problems. Whoops!

Furthermore, after an internship I found out that econometrics is not my only field of interest. I wanted to broaden my horizon, especially in the field of marketing and commerce. Of course I could follow some extra courses at Tilburg University, but I believed an exchange would be more fun. And this turned out to be absolutely true. It was one of the best semesters of my student life. I took five courses at Corvinus University, which was equal to the normal study load of a semester, meaning 30 ECTS. I took three courses in the area of marketing: Online & Digital Marketing, International Marketing and Theory of Consumption and Consumer Behavior. Furthermore, I took the course Technology Innovation and Knowledge Management. I did not expected a lot of this course upfront, but it was really great to see what kind of management issues are caused by the technological revolution. The last course I chose was Introduction to Health Economics. To be honest I chose this course because it had a least a little bit of mathematics in it and as a true econometrician I was afraid to miss it.

When choosing the university of my preference, I, of course, took into account the courses the university was offering, but I also took into account the way of teaching. During our bachelor's and master's program we do not have to do a lot of presentations, whereas I think this is a very valuable skill to practice. Luckily I was more than able to practice this with the fifteen presentations I had to do at Corvinus University. Sometimes I felt more like a high school student with the very interactive way of teaching. Your class participation was graded and

attendance was obligatory. In the end I was more used to this way of attending lectures and often it felt useful to attend the classes.

After arrival

When arriving at Budapest Airport, I was lucky that my ESN buddy was willing to pick me up by car, because otherwise I would probably still be stuck at the airport with two large suitcases and my backpack. Budapest is a beautiful city in both summer- and wintertime, but packing your suitcases for temperatures ranging from -5 to 30 degree is horrible. And another wise lesson I want to share: giving some summer clothes back to your parents in exchange for warm winter clothes and exchanging flip-flops for Timberlands will not make everything fit into your suitcases by the end of your semester abroad.

When arriving in the city center of Budapest I could directly move into my flat, something that I thought was a big plus. I choose to arrange my flat upfront, but I also know a lot of people that searched for their flat during the Hostel week. I think that both are good options, but it depends on your preferences. Choosing your flat after arrival gives the option to actually visit the flat before signing the contracts, whereas signing it upfront makes sure that you do not have to stay in a hostel in the first weeks.

After dropping my suitcases in my new room, I directly walked into the city and enjoyed the beauty of the city by night. During my time in Budapest, I really enjoyed just walking out of my flat and go in a direction I did not went before, enjoying all the beautiful buildings and nature in the city. One of my best ideas was probably to get out of bed at 5.30 hours to climb up the citadel with the plan to make some pictures of the sunrise without first checking the weather forecast. When I arrived at the top I found out that it was way too cloudy and misty to even see the sunrise.

The first week consisted mostly about getting to know each other and as you maybe already expected from an exchange in Central Europe, this was done while enjoying some drinks. Days were filled with walking around, enjoying the weather and doing everything you should do as a tourist in Budapest. Especially hanging around some swimming pools seemed to be a perfect activity. I can highly recommend the yellow waterslide in the water park on Margaret Island. (Note: I am not responsible for any physical injuries caused by this slide!)

After the first introduction week, finally one of the flat mates arrived, a German girl. Since I was used to living with 16 flat mates, I was really happy to no longer being all alone in our flat.→

When describing all the things that were missing in our rooms, we directly found out that making yourself understandable in English is absolutely not the same as knowing the English word for everything. Luckily, German and Dutch sounds often similar, so we managed quite well until our fourth flat mate arrived, an Italian girl. After her arrival we increased our drawing and Google Translate skills. Not only did we increase our communication skills, we also got more familiar with each others national dishes during our weekly dinner together. Last but not least, they made me a mother for the second time, because I was the oldest one of our flat and always taking care of them.

Weekend trips

When the first week of classes started, we were already thinking about how to escape normal life. So not even before the end of the third week of my exchange I went on my first weekend trip. With a group of 14 people we went to Ljubljana, Slovenia. After an extremely cold and uncomfortable night in the bus we decided to never go in a bus again for such a long time. Unfortunately the weather in Ljubljana was not as sunny as the weather in Budapest by that time. We expected it to be approximately the same, resulting in rafting in the rain on ice cold water. To test how strong our fresh friendships were, everyone was pulling each other into the ice cold water. I am proud to tell you that our friendship survived and we planned several more trips together.

In contrary to what some of you might expect, there are a lot of possibilities for weekend trips even when you are staying in Europe for your exchange. I had not seen a lot of Central and East Europe before my Erasmus-exchange, but I can highly recommend it. It has a lot of beautiful places to discover. I can recommend all of the places I visited: Kiev, Belgrade, Sarajevo, Novi Sad & Zagreb. Especially Kiev was definitely worth visiting. I found it unbelievable to walk around there while taking into account the recent history of that city.

After taking the bus to Ljubljana, we decided not to go by bus that far anymore. However, sometimes you have the choice between doing something by bus or not doing it at all. During our autumn break we decided to visit Belgrade and Sarajevo. Luckily there was a night train going from Budapest to Belgrade, so we directly decided to take that one. After entering the train we were wondering if it really was better than the bus, but in the end we all agreed on the fact that it was a unique experience. The same holds for the bus between Belgrade and Sarajevo. We found out that a bus in the Netherlands is never full according to the principles in Serbia.

Besides the trips I did myself, I had a lot of friends who wanted to visit me. This was of course a lot of fun and I really enjoyed showing them around in "my city". However, I would advise every future exchange student to think about how many visitors you want to have. In the weekend before my final presentations, I had some lovely econometrics friends visiting me as well as some friends from my home town. I can assure you that this weekend required some planning skills.

Asset | Econometrics in Budapest

When I am writing this article, it is the day before the COdE beer cantus. During this evening we are always introduced by stereotyping the average econometrician, which is of course never true. I want to share with you some stereotypes about us, which I also recognize in my fellow, non-econometrics, Erasmus students.

'I am proud to tell you that our friendship survived and we planned several more trips together'

First of all, after the first month of my exchange I found out that we were always going to the same places for lunch, coffee, or a drink, while Budapest has some much more to offer. When I was trying to convince the others to discover new places, they replied to me: "Why should we go somewhere else if we know this place is nice?" So a note to my fellow econometricians, it is not a problem at all that we are ending every party in the Boekanier. Luckily after a while my friends agreed with discovering new places during same bar hopping activities, but of course we always ended the evening in the same club.

Secondly, I quickly felt at home at the library of Corvinus University. When walking around in the library of Tilburg University, you can always spot some econometricians, even during the evenings and sometimes even during the weekends. Most of the time they are sitting at approximately the same places. When walking around at the Corvinus library I could always easily find my friends as they were always sitting in the same corner. And without any doubt, we had a lot of way too long coffee breaks.

Going back home

After four amazing months, it was time to go home. I was so sad about the fact that I would not be able to catch up with my new friends every day, that even before I actually flew back to the Netherlands I already booked a flight back to Budapest. Of course this one more week in Budapest in January was completely necessary, because it gave me an extra chance to bring all my stuff back to the Netherlands. I found out that a coffee machine especially takes up quite a lot of space in your suitcase.

Luckily when I came back to the Netherlands I did not have to miss all the everyday stories of my friends as we continued sharing everything via Snapchat, something we are actually still doing. Besides keeping each other posted about our daily life via the digital way, we already had several reunions. For example, we celebrated carnival with more than 15 people together in Cologne. This month we will celebrate Kingsday with a large part of the group together.

Looking back on this adventure, I can only say that I will never regret that even though I was already in the last phase of my master's I decided to go on exchange. I can highly recommend everyone to enrich your study time with a semester abroad. It is a unique experience which you can only gain by doing it. If you are ever doubting about doing it, I can only advise you to take the step out of your comfort zone and I assure you that you will never regret it!

A LED Never to forget!

On February 7, it was finally time for 2018's Landelijke Econometristen Dag (LED; English: National Econometricians Day). The LED is the biggest career event for students of Econometrics and Operations Research in the whole world. In total about 640 students and over 50 companies participated in the event's 28th edition.

Martin Faro

AGE: 21

Began studies in 2015

What was special about this year's LED, was the fact that the committee consisted solely of students from Asset | Econometrics. On November 29, the registration of the LED opened. In about two minutes all places were sold out! I was very pleased that I was one of the lucky students that got the opportunity to attend. During the registration, each participant also indicated which companies they wanted to meet during the day. To prevent people from not showing up during the LED, no one knew the company allocations before February 7. The day was split into a plenary session, a morning case, a lunch, an afternoon case, the KPN game show, a networking drink and in the evening a recruitment dinner. Afterwards a party would take place at 'Stairway' in Utrecht.

As it was the first time I visited the LED - registration is only open to third-year bachelor's students and master's students - I did not know in advance what I had to expect. Since the reception, during which all participants could drink a cup of coffee or tea, took place at 8.45 hours, I had to get up at 5.30 hours to be on time in Tilburg to travel together with my fellow students to the NBC Congress Center in Nieuwegein, near Utrecht. After a cold and tiring trip by train and tram to the NBC, I picked up my badge on which I could see which company cases I was going to attend. I was very pleased to discover that I could attend my three number one choices during the case rounds and the recruitment dinner.

After (almost) all students had arrived, the day was officially opened by Quirien Raat, the chairman of the LED 2018 committee. Afterwards, Tim Wolter gave a small lecture about his inspiring work at the World Food Program of the United Nations. During the first-year course 'Improving Society Lab' Koen Peters had already given a lecture on almost the same subject. Therefore, there was not much new information for me during this part, but it still was interesting since Tim touched upon aspects of the work that were unknown to most of us .

After this talk we had to find our way to the company of our morning case. I had the opportunity to meet MIcompany. MIcompany is a relatively small firm with offices in both Amsterdam and Tel Aviv. MIcompany presented themselves as the number one company in creating sustainable impact with data analytics. As is usual during most company meetings that one will attend during their time at university, we first got a company presentation. One of the founders of MIcompany gave an informal presentation of the company. The point that distinguishes MIcompany from other data analytics companies is their special academy program. The case was about a project for the Amsterdamse Concertzaal (English: Amsterdam concert hall). In groups of four to five people we had to run through a typical data analytics project. Our team scored some points during a few rounds, but we were far from brilliant, unfortunately.

At around 13.00 hours the lunch took place in the Event Hall of the NBC.

During the lunch each company had its own table where you could chat with the companies in an informal manner while enjoying the delicious lunch. This year there were also five startups present to have a conversation with. I spoke to a recruiter of one of these startups, Amsterdam Data Collective. ADC was found in the spring of 2017 and is a team of quantitative management consultants who generate strategic insights using cutting-edge data analysis techniques.

During the afternoon case I visited ORTEC. Due to their division ORTEC Sports, they have always had my interest. I was very pleased that their (short) company presentation showed that my expectations of ORTEC were right. Of course, there also was a case round. I was paired up with fellow econometricians from Rotterdam and Maastricht. Within five minutes our own airplane company 'Ortair' was born. We got a lot of information about passengers that were willing to fly from London to Amsterdam and New York. Together with the information on the airplane capacity, the ticket prices in different categories and the expected number of no shows we had to come up with a company strategy. Afterwards we played in total 50 rounds during which we had to decide within 30 seconds whether to accept or reject the customers in our airplane. When a decision was made, one could not change it anymore. We saw that a lot of our colleagues accepted a lot of customers in the beginning, while we were a bit more conservative. This allowed us to accept more business people in the end, who are on average willing to pay more than people who travel for their holidays. Before getting to know the final results, each company had to present their own strategy and their expectations on the outcome. Unfortunately, our tactics were not good enough to secure the first place, but we still did a good job.

The day was continued in the form of a game show. This show was hosted by the main partner of this year's LED, KPN. They prepared a quite fun game in which the different student associations had to compete against each other. Due to some knowledge of the Monty Hall problem and the intelligence (or maybe an educated guess) of Max van der Lee, chairman of Asset I Econometrics, it was quickly clear that the study associations FAECTOR, Scope I Vectum, Vesting and VSAE were no competition for the blue train of Asset I Econometrics. Only the study association of the Free University in Amsterdam, Kraket, stood a decent chance. However, Max managed to win the tiebreaker and won us some (extra) free beer.

The networking drink offered students yet another opportunity to get in contact with companies. Personally, I did not really feel like talking to a lot of recruiters anymore. After all, I was still happy to speak to some employees of Quintiq and Logex, companies that were both in my top three for the case rounds. At 19.30 hours the dinner was served. I spent the dinner at TNO, the Dutch organization for applied scientific research. The three-course meal, which was prepared by the chefs of the NBC Congress Center, was delicious.

At the end of the day all participants received a goodie bag filled with awesome stuff provided by the companies. In addition to this, everyone received a wristband which was required to enter the party at 'Stairway'. After arriving in Utrecht and checking in in our hostel for this night, everyone could attend the well-known LED party. I enjoyed a fantastic night, which was a great way to finish a very interesting day.

Finally I would like to thank the LED committee (Quirien Raat, John van den Hurk, Anouk Casparie, Max van der Lee, Wenxin Lin, Joris Piree, Christel Opheij and Jochem Bruijninckx) for organizing a wonderful day!

WIE IS DE MOL?

DIARY OF THE 'MOL'

On January 19, ten members of our association embarked on an intensive and treacherous weekend, during which only three would remain with the group till the very end. And one already knew he would, that one, that is me.

Day 1, 08.45 hours

'An early start'

The weekend started quite early, yet every candidate was ready to go. We met up at the Reitse Toren and after a short introduction by the organization we would drive to the location where most of the weekend took place. However as always, nothing is as it is perceived.

The first challenge followed, an auction for immunity tokens led by Ruud Hendrickx, but with what money? Before the auction could commence we all had to 'sell' some of our luggage to fill the pot. The perfect way for the Mol to make a good first impression and participate, fill up the pot a little, because of course it would be completely empty after the auction.

With an empty pot we went to Block013 for our second challenge, bouldering. I already knew that I should not be too good of a climber, since earning the group money is not in my interest. We had to bet on other competitors how well they would be able to finish the bouldering course, if we were right the group earned money, if not we lost. Luckily I was able to guess quite adventurous goals for my peers, without reaching my own. If only I was a little better at climbing…

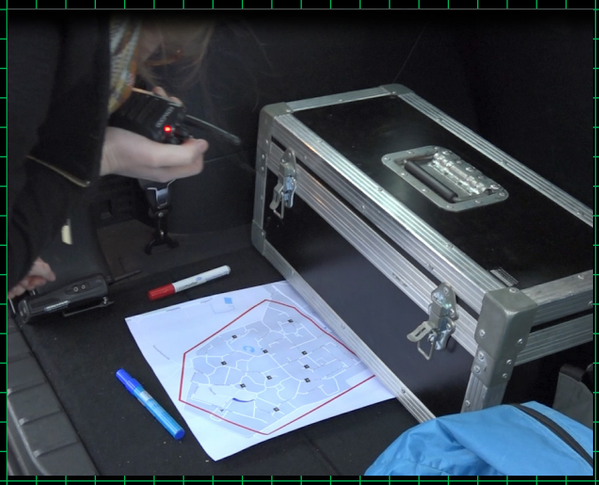
Day 2, 08.00 hours

'Are you ready for... execution?'

When dawn broke this beautiful Saturday morning we were no longer with ten, already only eight remained. The ambiance at breakfast however was still quite timid. Everyone was charging up for yet another intensive day.

This idyllic gathering was brutally disturbed by the presenter of this event, Thijs "Art" Kramer, with the legendary words: "I would like to meet you all outside for (…) execution." He disturbed all of us, well, most of us. We were used to him announcing the test and execution in unison, and now he only announced an execution.

The question "What does this mean?" was on all of our minds, feigning this might have been the hardest part of this entire weekend for me, as I already knew, nothing is as it is perceived..



Day 2, 20.15 hours

'Etherdiscipline!' -Ellie Lust

A true WIDM weekend is not complete without a challenge involving walkie-talkies. Communicating through these is always a challenge, especially if not everyone has the same goal. In this challenge we had to arrange three rooms exactly similar, without leaving our respective room, using only walkie-talkies to communicate. The number and selection of items however was different for each room. And due to the total lack of trust between candidates at this point, this lead to chaos and confusion.

The candidates in one room were adamant that their items which were not present in other rooms had to be discarded. This idea might seem a bright one, but not in the minds of the candidates of the other rooms. Stubbornness is a trait I think can be attributed to every econometrics student, yes you as well, and therefore the discussion that ensued from this misunderstanding was quite fierce. And of course every remaining candidate was aware of the fact that one of us was trying his very best to make sure that this challenge would not be met. Luckily I did not have to try that hard this challenge, the candidates were already creating enough confusion themselves.

Day 3, 19.00 hours

'Have I been caught?'

After three thrilling days it was finally time for the final. Only two candidates were left, and me of course. These candidates were not here for nothing, they were here to win. Furthermore they had reached the final because of their test results. If you had persevered this far, you must have been on the right path. Being in a room, sharing a table with them, for one last time while trying to uphold the mirage of being just another candidate was quite hard. I knew they had probably busted me, but I still had to try. I was just a bystander from here on. Who would win? Who had followed my actions the best? Who knew I was the 'Mol'?

IK BEN DE MOL

Dealing with Disasters

Hurricanes, tsunamis, earthquakes, wildfires, landslides; they are just a few examples of natural hazards that strike Earth every single day. While natural hazards have occurred from the very start of our planet, the likelihood that one of these also results in a major catastrophe has increased immensely over the years (see Figure 1), due to the ever-growing population and the fact that more and more people start living in high-risk areas. All is not lost, however, as (big) data-driven techniques come to the rescue!

Text by: Ennia Suijkerbuijk

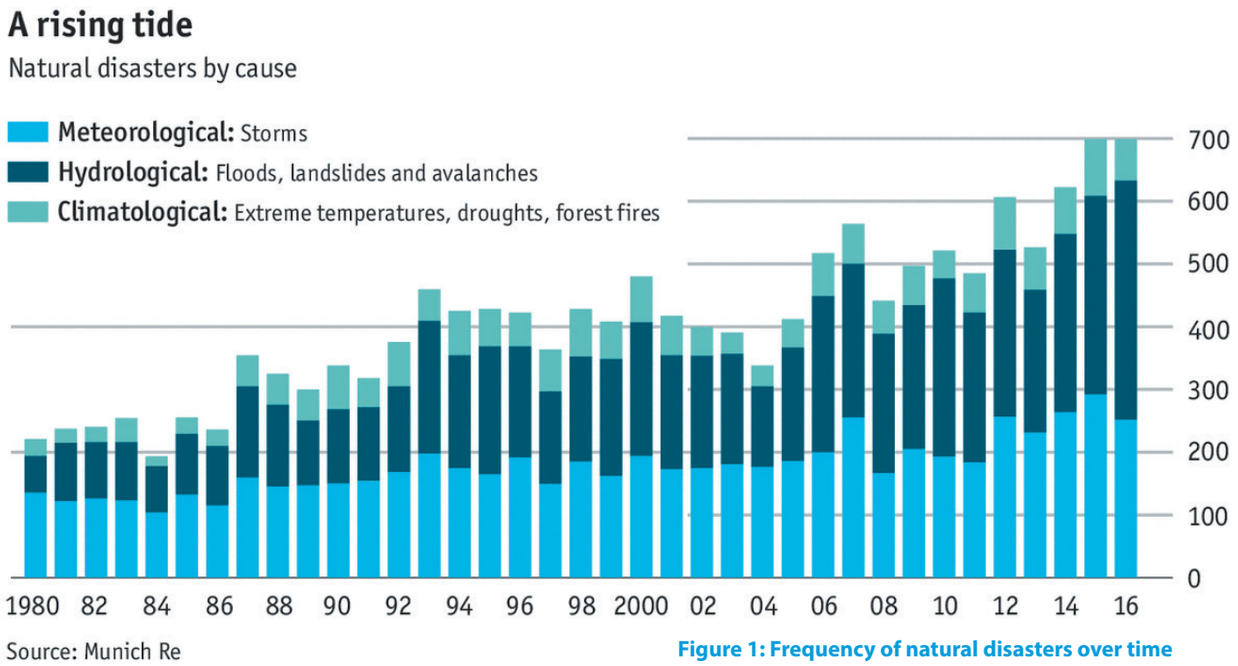


Figure 1: Frequency of natural disasters over time

While there is not much we can do to prevent natural hazards, there is much that can be improved when trying to combat such disasters. For this purpose, all sorts of machine learning, statistical and optimization techniques are applied, which can be used for three distinct aspects:

1. Disaster detection: trivial as it might seem, the detection of natural disasters directly after they occur can still be improved.
2. Disaster prediction: these tasks involve predicting/forecasting the time, place and magnitude of a disaster.
3. Development of appropriate disaster management strategy: these methods deal with optimally distributing relief items, enhancing communication, and identifying appropriate concern of the affected people.

Though the main goal is the same for each of these three aspects (i.e. minimizing casualties, evacuating/rescuing all victims and immediately minimizing/reconstructing damages), different techniques are applied for every subtask. In the remainder of this special, all three aspects of dealing with disasters will be discussed separately with several examples.

1. Detecting disasters

Even though we are living in the age of data, scientists are not able to measure all weather/seismic abnormalities, as there are still quite some poorly-instrumented regions. As a result, not all natural disasters are detected; what is more, the news of detecting the disaster's location often takes a long time to be communicated to the proper authorities. Residents can help governments by communicating a natural emergency directly to them, but logically this is not the fastest/best way to receive information. Recently, Twitter has become an important source for real-time detection of disasters, as well as understanding the needs and concerns of the affected people.

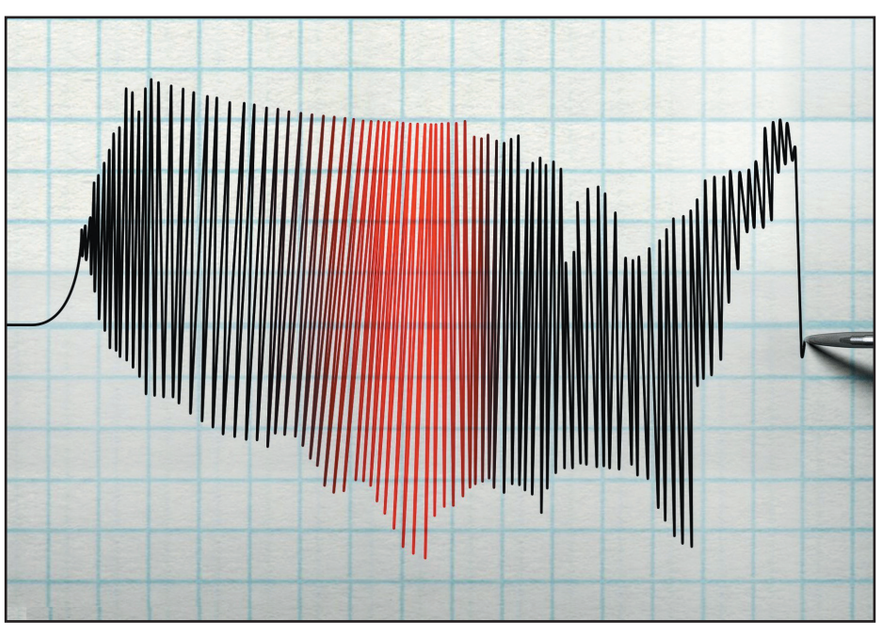
For instance, by downloading all tweets that contain the word 'earthquake' (or its equivalent in other languages) and subsequently analyzing them by applying data mining techniques, Twitter has become a very valuable supplement to the seismic network. Even though not all earthquakes are tweeted about and exact magnitude estimates on Twitter are usually not reliable, Twitter makes rapid detection possible, as people start sending public tweets within tens of seconds after feeling shaking. As not all earthquakes are being tweeted about, Twitter is in no means a perfect

replacement for seismic networks, but it can definitely help with rapidly detecting earthquakes. Such text-mining techniques are not limited to earthquakes, as other types of disasters can of course also be detected.

2. Predicting disasters

While being able to rapidly and reliably detect natural disasters once they have happened is already a great improvement, the best scenario would be if we could predict when and where disaster will strike, such that the amount of casualties and damages can be even further reduced. However, many academics believe that accurate disaster predictions are inherently impossible, as no one completely grasps e.g. the important shifts in storm dynamics that trigger a tornado. Nonetheless, with the help of massive loads of data, ever-improving simulation tools and highly-sophisticated techniques, scientists are becoming better and better at demystifying and predicting natural disasters.

One of the reasons why the quality of disaster predictions has increased over the past years concerns dimensionality. As you can imagine, there are numerous factors that are related to the event of a natural disaster. Clearly for earthquakes a series of geological factors affect its probability of occurring (e.g. rock frictions and rupture), but there are many more variables that could help predicting the place, time and size of earthquakes.



There are several studies that include the (abnormal) behaviour of animals, as quite some researchers believe that animals are more capable than humans at perceiving certain kinds of geophysical stimuli that precede earthquakes. An example of this occurred in 1975, when before an earthquake snakes starting to come out of their hibernations and 'froze' on the surface of the earth, along with groups of rats. Apparently also other types of animals were behaving abnormally, even months before the earthquake took place (Bhargava et al., 2009). Besides including animalistic behaviour, there are more types of data that can be useful for disaster predictions. For instance, in 2009 a group of researchers decided to use time series data to predict earthquake events (Aydin et al., 2009). As a result, hidden temporal patterns that are characteristic and predictive of time series events can be revealed.

However, even with a higher number of explaining variables it is difficult to predict the occurrence of natural disasters, which is partially caused by a lack of data. This may seem counterintuitive given that we are living in the era of information, but one should keep in mind that natural disasters (luckily) are very rare events. As a result, almost all data entries are irrelevant, as we are only interested in very extreme observations (perhaps even more extreme than available in historical data sets). This concept is better known as extreme value theory. Extreme value theory is for instance used to model extreme historical losses of natural catastrophes in the world or to determine the exact relationship between hurricanes and economical damage.

However, with the uprising of machine-learning, a high amount of different approaches is also being used to predict the various different disaster types. To model floods for instance, logistic regression, frequency ratio models, genetic algorithms and artificial neural networks have been used. For landslide predictions also support vector machines have been used, along with e.g. naïve Bayes and simulated annealing. Techniques for other types of disasters also include particle swarm optimization, linear discriminant/semantic analysis, clustering and multivariate time series (Goswami et al., 2016). →

Hence thanks to more (elaborate) data sets and an increase in explanatory variables, as well as the rapid evolution of mathematical and machine learning techniques, we are becoming much better at accurately predicting where and when natural disasters will strike. While the forecasting will probably never be a perfect science, already many lives have been saved.

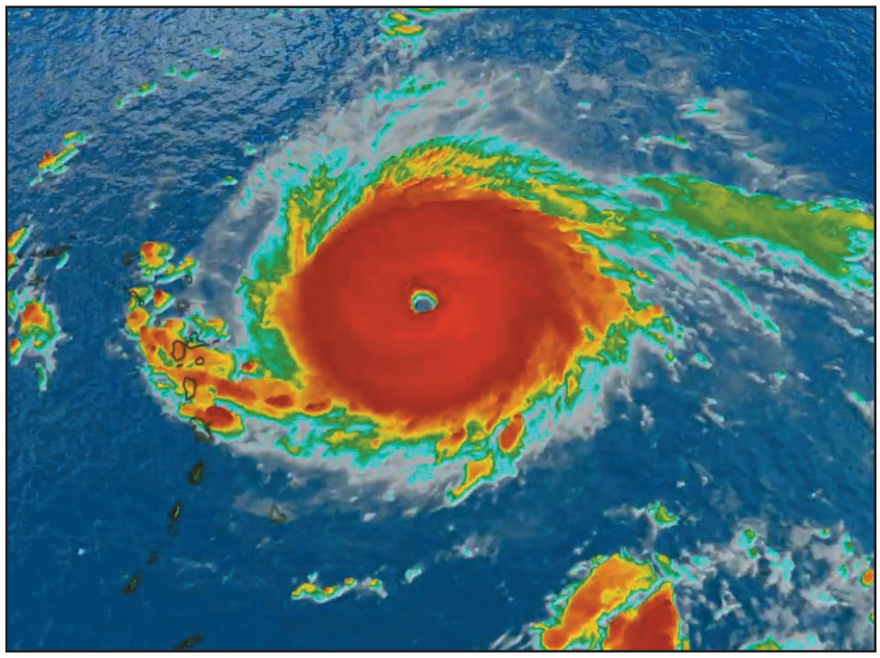
3. Disaster management

The third area in which (big) data and econometrical techniques can help dealing with natural disasters concerns the development of appropriate disaster management strategy. Once a disaster has struck, it is important that the affected inhabitants receive fast, fitting and sufficient aid; which specific resources are required depends on the area, type of disaster and its magnitude. Basic examples are (drinking) water, food and appropriate shelter/housing (e.g. tents). Furthermore, in the 48 hours after the disaster, search and rescue missions play an important role, together with first aid help. For a more long-term vision, often field hospitals are needed to treat diseases and perform heavier operations.

In order to determine which specific type of aid is required by the people affected by a natural disaster, it is possible to extract their needs by applying text mining and topic extraction to e.g. social media. As a result, the thoughts, complaints and requirements of the affected people can be analyzed, such that the process of providing appropriate support can be improved (Hashimoto, 2014).

However, in reality there is never enough money to fully support everyone affected by the disaster. An example of how mathematics can improve the amount of aid that is delivered can be found with the UN World Food Programme (WFP), which helps around 80 million people with food assistance every year. They use e.g. mixed integer linear programming as a basis for models and tools that help decision-makers optimize food baskets, as well as sourcing and routing plans (Peters et al., 2016).

Besides the improvement of machine-learning and optimization techniques, our advanced technology and the availability of (big) data also helps better managing the aftermath of disasters. For instance, when historical data is available about how a population responded to a previous disaster, this also gives more insights in the reactions of residents to new disasters. Besides, more detailed information about the social demographics of an area (such as which communities house a higher fraction of infants or elderly people), can also help identifying which mobility support or resources are needed. Finally, it is currently much easier to send real-time information to residents when a disaster has just struck.



Conclusion

Thanks to the ever-increasing amount of data, as well as further developments in data-driven and mathematical techniques, we are getting better and better at detecting natural disasters and appropriately dealing with their consequences. Recently researchers have also vastly improved their predictive techniques determining where and when a disaster will strike. While we are currently still a long way from being able to correctly predict most disasters on our planet, the developments of the past decades in areas as machine learning, econometrics and mathematics have already massively improved our ability of dealing with disasters.

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What is your Next Step?

After some blood, sweat and tears, the Econometrics in Practice Day (EPD) finally took place. Wait, did I say took place? At time of writing, all the participants are working on the cases of EyeOn and SINCERIUS. The committee is happy to have some time to take a breath, except for Jeroen. He is doing his best to shine on EyeOn's case.

After making the Yearbook of 2016/2017 I wanted to participate in the organization of a formal event, so I took place in the EPD committee as chairman. The committee started in October 2017 with our lovely committee members: Maud and Jeroen and our coordinators: Anne and Loes. We started of quickly by making a planning for all the upcoming weeks leading up to this day. As the one in charge of External Affairs of our committee, Maud started contacting companies for the presentations and cases. She spend a few days at Asset | Econometrics to call and eventually arrange two presentations and two cases for the EPD. The companies were there, now it was time for the detailed planning of the day. We wanted another setting for the lunch than the other on-campus formal activities, so we contacted café Esplanade. This was also a good setting for the speed dates, which was a new concept added to the EPD. Furthermore, we brainstormed about another idea for the registrations. So together we came up with the idea of goodie bags. We thought it would be nice to fill the bags with products of both Asset | Econometrics and goodies of the participating companies.

Now it was time to make sure we had enough participants. The first thought was 'we need a really good slogan'. Nevertheless, it was not as easy as we thought… After weeks of googling, we kind of gave up on the slogan idea and then someone came up with 'What is your next step?'. We all agreed that this slogan would fit the concept of the day. Subscriptions opened and flyers were printed. Even though in the beginning we thought we would not reach the aimed number of participants, forty students subscribed. This is (of course) due to the lecture talks, blackboard post and the small, but funny mistake on the back of our promotion sweaters.

Today we could finally show all the econometricians the work we have done for the EPD. The day started with a lot of rain, so our day could have started better… Nevertheless, we had an amazing start today with a lot of motivated people. Everyone was really enthusiastic about the goodie bags. After the first round of presentations, it was time for the second round. A former econometrics student was one of the speakers, it was nice to see him back on campus.

I have learned a lot during this half year about organizing, planning and connecting. It was interesting to experience the work that comes with such an event. I never knew it took so much work to organize an EPD. I enjoyed it so much that I decided to be the chairman of the Lustrum of 2019 as well!

Bid Optimization in Search Engine Advertising

What do you do when you want to buy a phone, choose a restaurant or find out the weather of the day? You go to Google. And when you search something in Google, you get two types of results: organic results and (paid) advertisements. Now, I am quite a lazy Google user: I rarely bother to scroll down all the way to the bottom of the page. Advertisers know this: they know people are lazy and are going to look at the top search results. That is why, each time you perform a search query, advertisers engage in a fierce competition behind the screens, bidding against each other in a special auction to get the top advertisement positions. For an individual advertiser, this is a very challenging game to play: he does not know the bids of his competitors, and they are constantly changing their bids. A model that can estimate the bids of competing advertisers would therefore be incredibly helpful!

Text by: Masum Rahman

For my master's thesis, I developed exactly such a model as part of an internship at Greenhouse Group (Eindhoven). This is an umbrella organization for six innovative companies in the field of digital marketing. Unlike traditional marketing channels, digital marketing offers much richer data – and opportunities for econometricians. The Data Science team at Greenhouse Group has grown steadily over the years, and is constantly exploring new techniques to address the challenges in digital marketing, of which my thesis is just one example.

Introduction

Let me first introduce some key concepts so you fully understand the problem we are dealing with. The branch of online marketing that deals with advertising in search engines like Google is called **Search Engine Advertising (SEA)**. Advertisers can place bids on search terms ("keywords") they are interested in. Each time a user searches for a keyword, Google identifies which advertisers have placed a bid for that keyword. The available ad positions are then distributed between these advertisers through an auction.

This auction has some very special rules. The first rule is simple: *ad positions are distributed in the order of the bids*. The advertiser with the highest bid gets the top position, the second-highest bid gets the second position, and so on. The next two rules concern the payment. Firstly, you only pay if the user actually clicks on the ad. This is known as the **cost-per-click (CPC)** principle. Secondly, the amount you are charged (i.e., the CPC) is not your own bid, *but the minimum amount needed to beat the next-highest bid*.

Figure 1 shows an example. Suppose a user searches for "bike". Three advertisers (A, B and C) are bidding for this keyword. Advertiser B has the highest bid (€4), so he gets the top position. The next highest bid is that of advertiser C (€3), so advertiser A pays the minimum amount needed to beat that bid: €3.01. Analogously, advertiser C gets the second position and pays €2.01, the lowest amount that beats the bid of advertiser A. Finally, advertiser A pays the default minimum CPC in Google (€0.05), because there is no next highest bid for him.

An important consequence of these rules is that your costs depend on the bidding behavior of your competitors: you can not just "do your own thing", your optimal strategy depends on what others are doing. There are two more complicating factors: firstly, the AdWords auction is a **sealed-bid** auction. You never get to know what the bids of the other players are. Secondly, it is a **continuous** auction: players can change their bid at any time. These two factors make the bidding market very complex and dynamic, which makes it difficult to make predictions.

The problem

What is the point of participating in SEA? Why do advertisers want users to click on their ads? The answer is simple: to generate profit. The challenge for the advertiser is therefore choosing (for each keyword) the bidding strategy that maximizes the profit. The profit can be written as the product of *the number of*

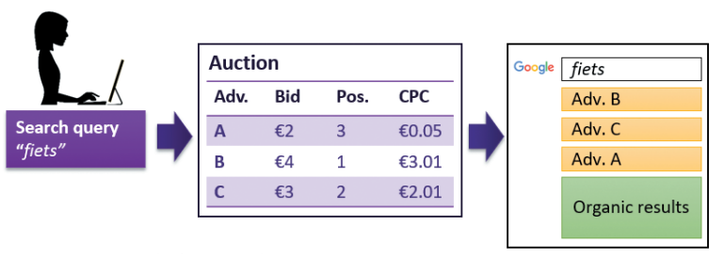

Figure 1 – Google keyword auction

clicks and the *profit per click*, as shown in Figure 2 in purple. Here, the VPC is the value per click (assumed constant). To determine the optimal bid, we need to understand how the bid is related to the profit. The blue lines indicate how the variables affect each other. Our bid determines which position we obtain. Next, each position has an associated click volume and CPC. We know that a higher bid gives us a better position. On one hand, this results in more clicks; on the other hand, these clicks are more expensive (higher CPC), resulting in a lower profit per click. This is the basic trade-off we make by changing our bid. To understand how exactly this trade-off plays out, we need models that can quantify the relationships reflected by the blue arrows.

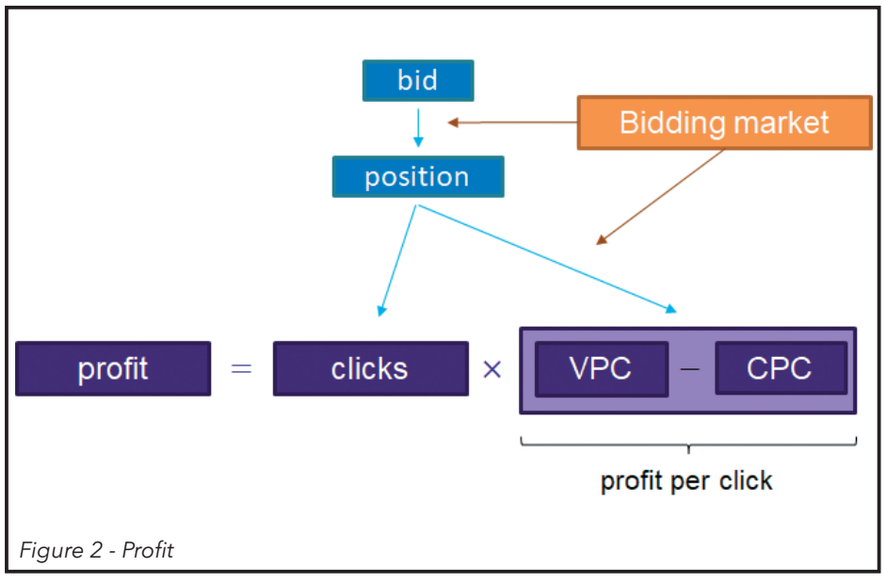

Figure 2 - Profit

Now, two of the three relationships are determined by the "bidding market" (the bids of our competitors), as indicated in orange: the bidding market determines the position we get for a given bid, and it determines the CPC of each position. If we can capture the bidding market in a model, it should therefore be possible to model both CPC and position using a single model.

This brings us to our research questions:

1. How can we jointly model the outcome variables of the bidding market: the position and the CPC?
2. How can we use this model to calculate the optimal bid for a keyword?

The problem is now defined: we are bidding against our competitors in a position auction in order to generate profit. We understand how the outcome of this bidding market is related to our profit, and we need to develop a model to estimate these relationships.

The solution

Now the problem is clear, let me introduce you to my proposed solution. Our starting point is the relationship between bid and position: which position can I expect to get for a given bid? To model this relationship, I propose the **ordered logit (OL)** model. This is a so-called ordered dependent variable model, in which the dependent variable is restricted to a limited range of categories that have some kind of order to them. A typical example is an exam grading system (the Dutch system of 1-10 or the American system of A-F).

Basically, the model works as follows. Suppose our dependent variable Y is limited to some ordered set $\{v_1, \ldots v_J\}$. The OL model defines a *latent* variable Y^* that is linearly related to the regressors X with parameter β:

$$Y^* = \beta X + \varepsilon$$

where the ε are independent and follow the logistic distribution (which looks similar to a normal distribution). The actual dependent variable Y is related to this latent variable through so-called *threshold values* $\alpha_0 < \ldots < \alpha_J$ according to:

$$Y_t = \begin{cases} v_1 & \text{if } \alpha_0 < Y_t^* \leq \alpha_1 \\ \vdots & \vdots \\ v_J & \text{if } \alpha_{J-1} < Y_t^* \leq \alpha_J, \end{cases}$$

where by definition, $\alpha_0 = -\infty$ and $\alpha_J = \infty$. In our model, the dependent variable is the ad position, *pos*, which is limited to the values $\{1, 2, \ldots, 5_+\}$ (in our research, we define the category 5_+ as a rest category, because clients are typically only interested in the first four positions). As our regressor, we take the bid amount, *bid*. We illustrate a simplified version of our model, with only three positions, in Figure 3. The green line shows us the baseline without error (i.e. for ε=0). We see that the two thresholds divide the y-axis into three categories. For very low bids, the regression line (green) maps to the lowest category (position 3). If we increase our bid, we will at some point cross a critical value after which the regression line "jumps" to the next category (position 2). This critical point is indicated by the left arrow (blue). If we increase our bid further, we will again cross a critical value after which the line jumps to the first category (position 1). This point is reflected by the blue arrow on the right. →

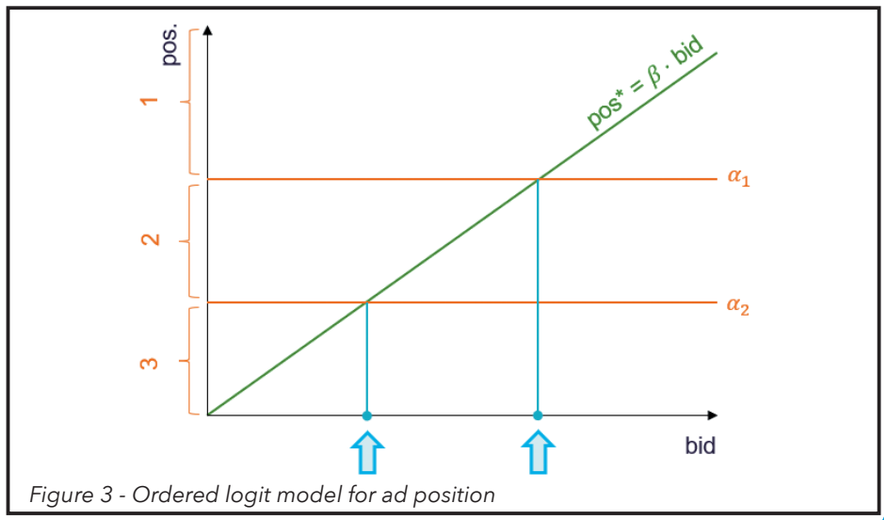

Figure 3 - Ordered logit model for ad position

It turns out that the two critical points have an important interpretation – the key insight of my research. The critical points must be the bids of our competitors (which would be the CPCs for positions 1 and 2). Why? In the model, the switching points are the bid amounts where the regression line "jumps" a position. In reality, this is what would happen if we cross the bid of a competitor: we would "jump" up a position.

Now, let's have a look at what happens if we include the error term, which captures our uncertainty about the bidding market resulting from the fact that the auction is sealed-bid and continuous. We illustrate this in Figure 4. We see that the error term is basically a vertical shift of the regression line. As a result of this shift, the critical points (i.e., the bids of our competitors) shift as well, as indicated by the blue arrows to the left. In this example, the market has become cheaper, but of course it could go the other way as well. Since we know (assume) the distribution of the error term, we can infer the distribution of the CPCs as well. In my research, I develop this concept much further (but if you are interested in that, let me know!).

I use this model to develop estimates of both the position and CPC as a function of the bid (as I stated before in my research question). For the relationship between click and position (see Figure 2), I used a model from existing research.

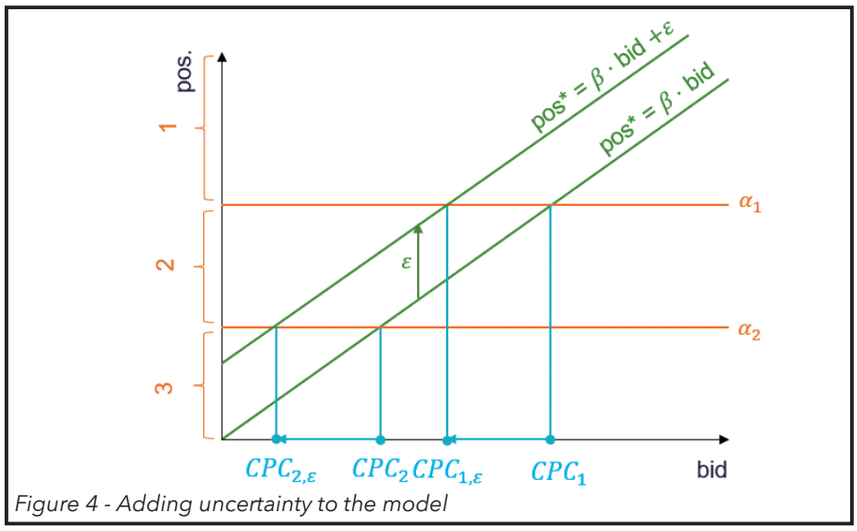

Figure 4 - Adding uncertainty to the model

Conclusion

You now understand the basics of SEA. Advertisers are bidding in a special auction for the top ad positions in Google in order to get your attention. The bids of our competitors determine both our position and our CPC as a function of our bid, as captured by our proposed joint modelling solution. Using this model, we are able to estimate the profit function and determine our optimal bid, giving advertisers the tool they need to successfully play the complicated, dynamic bidding game of SEA. ●

Masum Rahman
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Began studies in 2010

Results

I used the model described above to estimate the profit function for four different keywords. Figure 5 shows the estimated functions. The blue line shows the profit function; the green dot indicates where the profit is highest. Interestingly, we see a significant variation in the optimal bid, even though these four keywords have the same value per click (VPC). This suggests that the trade-off between click volume and profit per click plays out very differently for each keyword. An important cause of this is the bidding market: because this market is different for each keyword, our strategy should be adjusted accordingly. This is a major step away from the traditional marketing practice, in which it is assumed that there is a general optimum which applies to every keyword.

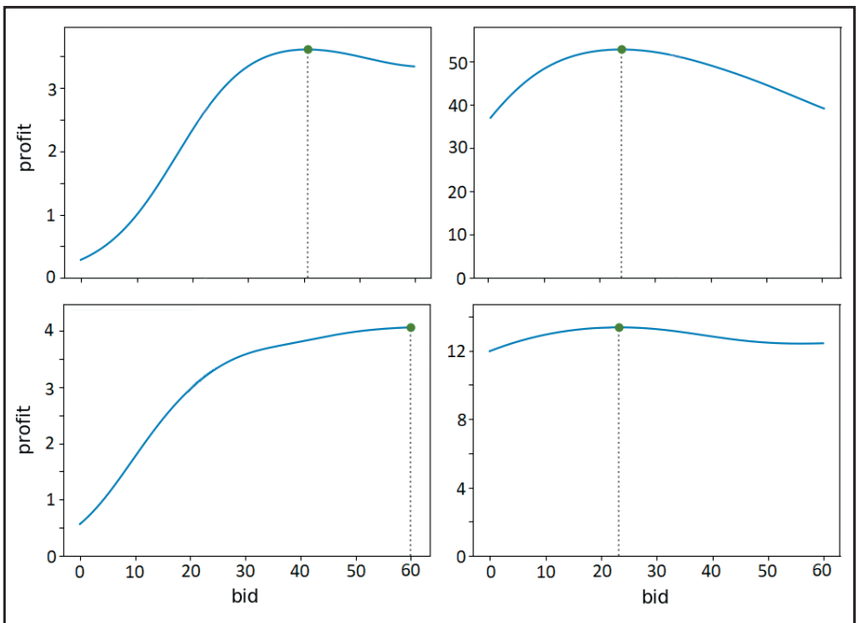

Figure 5 - Profit function estimates

Bumping into PwC

On Wednesday March 28, together with fifteen students from our studies I went to meet PwC. This firm, formerly known as PricewaterhouseCoopers, is one of the biggest employers in our field. With 4800 employees and twelve locations, just in the Netherlands, they are truly a force to be reckoned with. These numbers and figures are some details more suitable for a company day or the LED for instance, this activity however was an informal activity. So, how about bumper car football?

Text by: Guus Vlaskamp

The afternoon kicked off with a small drink at the Voltage. While attendees arrived, some a bit delayed because of the abominable weather, there was time to meet the employees of PwC. Since everyone was a bit hungry and tense for the bumper cars, the drinks and snacks presented to us were very welcome. This joint desire was a perfect social bonding experience, and led to a much less formal setting for students and employees to meet each other. There was no official presentation or introduction to the company and this resulted in me being quite interested in the who and what of our host. The introduction I got into PwC was very personal and anecdotal, and therefore this did not seem a sales talk, as some introductions do, but much more like a look into the company.

After everyone had quenched their thirst and satiated their hunger, it was time for the bumper cars! This usually means brainless bumping into each other, combine this however with football and the game becomes much more tactical. Well, sort of... Most of my fellow students lacked a bit of control on the steering wheel, as did I. This chaos did result in a very enjoyable activity.

‘This resulted in a very relaxed ambiance where it was very easy for students and employees to mingle’

With a bit of a sore neck, and a rattled head, we returned to the bar. If you were left with some questions after the first talk, this was the chance to ask them. That is, if you were still able to remember those questions after the intensive game. Again this resulted in a very relaxed ambiance where it was very easy for students and employees to mingle. I thought this was a very enjoyable afternoon, and this way of meeting a company is quite nice. Without the formal atmosphere usually surrounding student-company contact, it makes it sometimes a bit easier to ask questions and get a look into the company. I look forward to the next informal activity!

Time for Some New Ideas

In the evening of January 16, 2018, the half-yearly members meeting took place which included both a General Members Meeting (GMM) and an Active Members Meeting (AMM). Around 30 people were present to listen to the policy of the board and to give their opinions.

Joris Piree
AGE: 21
Began studies in 2015

Earlier that day, the board was very stressed and busy preparing this meeting, which would take place in the evening. As the evening finally arrived, we first went to the Happy Italy to enjoy a delicious meal with some fellow econometricians, after which we continued to De Heuvel Gallery where the member meetings usually take place. Lots of papers where handed out, such as the financial report and the agenda.

After taking a cup of coffee or tea, the GMM started with a short introduction and overview of the evening by the chairman. All the five members of the board told us their updates and progress and you could see why they had been working that hard all day (and of course the past half year). All things seemed to be running well, as the board guided us through their policy, plans and ideas. They also showed us the happenings of the past half year by means of a very nice video.

After the updates of the board, the Advisory Council, which was represented by former chairman Linda Torn, had the opportunity to spread its words. However, they did not receive many updates from the board the past half year and no meeting with the council had been held due to circumstances, so she was not able to tell us that much.

When the GMM ended, it was already so late that there was not any time for a break or any cherry turnovers, one of the most important traditions during the members meetings, since the drink would start at 22.00 hours. Luckily we still had some turnovers during the drink afterwards. Besides that, we also did not have time left for the AMM, which was most important for a lot of attendees, because they would have the opportunity to share their ideas during this meeting. Hopefully the board is able to plan an Active Members Meeting later this year, since it is very important to listen to the opinion of their members.

'We drank some beers, ate a cherry turnover and had lots of fun'

At the end of the evening it was time for some fun and drinks at the first drink of the year: the New Year's Drink! Many econometricians gathered at Café de Nachtwacht, the local pub where most drinks of Asset | Econometrics take place. We drank some beers, ate a cherry turnover and had lots of fun. During this evening also the announcement of the location of the yearly International Business Tour (IBT) took place. They told us we are heading for Seoul next October, which was received with a lot of enthusiasm by the members of Asset | Econometrics. In conclusion, it has been an enjoyable and interesting evening and I am looking forward to see how the board will implement their ideas the upcoming year.

AEGON

Aandacht voor je toekomst

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Meer weten over de mogelijkheden, onze kernwaarden of de sfeer? Ga naar werkenbijaegon.nl

Five Cold Days in Prague

Just like other years, the members of the Trip Committee had been working their asses off to organize an all-inclusive trip. But unlike other years, this trip was more than a bus ride away. This time, we travelled with a group of thirty econometricians to the beautiful (but also extremely cold) capital of the Czech Republic: Prague!

Bob Suijkerbuijk

AGE: 22

Began studies in 2017

Day 1

Thursday, 04.45 hours in the morning. At this impossible time we were supposed to meet on campus. Consequently, people were tired, grumpy or still drunk. This resulted in not everyone making it in time. When the last person arrived, we were ready to get on the bus for our first stop: Eindhoven Airport. Due to slight miscalculations of the Trip Committee in combination with the working mentality of some employees at the airport, we were only just in time for departure. By the time everyone was more or less awake, we had already landed in Prague where we took the bus and subway to get to our hostel.

When we were all settled in our rooms, we got ready to start the first activity: the city tour! We were led by a Czech gentleman, who showed us several famous places, such as the main square and the longest shopping street of Prague. During these stops, we were told about the rich history of Prague and its surrounding areas, known as Bohemia. After a small break, we had the choice to continue the tour or to discover the city a bit more on our own.

After some relaxing in the hostel, we went to the Beer Museum! First, we were able to learn and see things about the process of making beer, such as trying old machines and tasting the actual ingredients, like hop and malt. We then went to the more important part: drinking beers! We had four different beers, which were all great. Afterwards, most of us went to the hostel to rest. In the evening we went for dinner in a small and cozy restaurant, where we had hamburgers. The first day ended in the hostel, since everyone was really tired.

Day 2

The next morning, everyone was well-rested and ready for a brand new day. After having breakfast in the hostel, we departed for Therezín: a small ghetto nearby Prague, where a lot of Jews

used to live. We first visited the ghetto museum, which had an exhibition about the transport of the many Jews who were departed to concentration and working camps during the Second World War. This was really impressive to see, because it made you realize the amount of lives that were lost during this period.

Afterwards we went to the small fortress, also located in Terezín. This place was used to imprison people, such as the Jews in WWII, but also people like Gavrilo Princip, the assassin of Archduke Franz Ferdinand. After a tour by our own guide, we went back to the ghetto. Here, our guide showed us things like the cemetery as well as a crematorium, but also old buildings people used to live in. After this very impressive but long and cold day, we headed back to Prague.

Back in the hostel, we rested in order to prepare for a long night of partying and drinking: the pub crawl! After having dinner on our own, we were ready for a wild night. Led by our host Axel and his colleagues, we went to four different bars and clubs. To be honest, the great memories shared and made in this night are all a bit fuzzy, but definitely proof of an exceptional night.

Day 3

Day three was again a busy day. Most of us were pretty hungover, which resulted in the programme having to be delayed by an hour. Around noon we started our journey to the Prague Castle. It took quite some time to get there, since a lot of stairs had to be climbed to reach the stronghold. Once we arrived, we had a beautiful view over Prague. We also had a look inside the castle, which was beautiful as well.

After dinner, everyone got ready for another long night. We started the evening with a ghost tour. A British girl took us to several places in the city →

and told us about old legends and spooky stories. Although it was a very fun and scary experience, everyone was really cold and wanted to go inside. That is why we were glad once finally entering the karaoke bar! We sang a lot of classic songs as well as recent ones, while enjoying some beverages. The one who deserves a special mention is Jon, who definitely stole the show during the night with his voice and performance!

Day 4

Day four! A bit tired and sick, but with a good mood, we went ice skating to get rid of our hangover. Even though some were better than others (Stephan for example…), we had a good time on the ice rink and beautiful pictures were taken. After this physically intense activity, we had lunch in order to gain back strength. It was then time for my personal highlight of the trip: driving through Prague on a beer bike!

After splitting up the group in two, we were ready to ride the bike. Through the streets and alleys of Prague, we had a number of beers and sang the greatest songs while trying our hardest to get around on the bike. There were a lot of hills and slopes, which meant we had to pedal extra hard. A lot of other tourists made pictures of us, which was strange but also funny to see. Unfortunately, after an hour and a half we had to get off the bike and continue our way on foot. Most of us went for some lunch and others focused on getting to the hostel as quick as possible.

'It was then time for my personal highlight of the trip: driving through Prague on a beer bike!'

In the evening we went to our favourite bar Double Trouble. Since it was the last evening, some people decided to peak, especially Bernard! What a night that was!

Day 5

On the last day, we woke up pretty early to pack our stuff. After having breakfast, we had to check out from the hostel. But we were not done yet, since we were going to the zoo of Prague! This zoo is one of the largest in Europe with every kind of animals you could think of. We first took a photo of the entire group, in order to create a lasting memory of the amazing time we already had together.

After visiting the elephants, tigers, lions and weird-looking fish, we returned to the city centre to have our last dinner together. Then, we picked up our luggage at the hostel and headed for the airport. When we arrived, it quickly became clear we were going to have a long night at the airport: our flight was delayed by three hours. In addition to that, we had to fly to Amsterdam instead of Eindhoven. Nonetheless, we had a lot of fun at the airport playing games and listening to music. After a quick flight and two bus trips, we finally arrived in Tilburg. Sadly enough, the trip was over!

A special thanks to the Trip Committee, who realized this great trip! I also want to thank the entire group, each and every one of you are fantastic people. It was a blast!

Prizzzoner's Dilemma

Made by:
Loes van der Linden

Let's Talk!

Text by: Linda Torn

(Childhood) dream jobs

Every child has a dream job. And although we all really like econometrics, as little child almost nobody dreamed of a career as an econometrician. We were wondering what little econometricians envisioned as their ideal career. Did you have an idea what you wanted to do when you would grow up? Did you already have some interest in analytics? Or did you just wanted to become rich? Lots of question, so we wanted answers. Therefore in this 'Let's talk': What did you want to become when you were younger?

Jochem Bruijninckx:
"I wanted to become a police officer, because it would give me a chance to catch thieves and beat them up. Furthermore, as little boy I thought it is just cool to be a police officer."

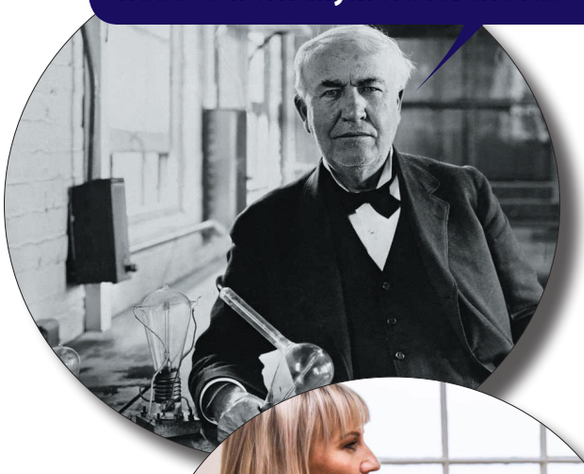
Max Wilke:
"Pilot seemed a perfect fit for me. I really liked airplanes since they fly in the air and that was a kind of magical as a child, so therefore I wanted to become a pilot."

Quirien Raat:
"My dream was to become a veterinarian. I really like animals since people are difficult and annoying, but animals are not. Animals are cute. As child I considered that as a good basis for my future career."

Yasar Erbek:
"As a little boy I wanted to become pilot. I really liked airplanes (and I still do). But my eyes are too bad to become a pilot, so then I decided to start studying econometrics. Now my dream is to work for an airline as an econometrician."

Joris Piree:
"Archaeologist! Probably mainly because of some movies I saw about the Ancient Egypt. It seemed really adventurous, that is what I liked about it."

Pierre Verhulst:
"I used to have magazines which explained how things work and how things were made. I was really interested in those magazines, and therefore I wanted to become an inventor. Furthermore, you only need to have one good idea and develop that, and then you do not need to work anymore for the rest of your life!"



Karlijn Koerts:
"I wanted to become a hairdresser, but only for the bridal hairstyles. I really liked to braid hair. Ooh and in buddy books I used to write down that I wanted to marry a rich man!"

Jaron Kappers:
"First, I wanted to become a writer. I did not really have a reason for that. After that I wanted to become a judge, since I can not stand injustice. I still do not know why I started studying econometrics. Unfortunately I am now studying econometrics."

Jasmijn Aartsen:
"I do not know why, but I wanted to be a newsreader on television! I always saw that on television and I was like: 'Oh, seems cool'. But now I would not like it anymore."

Loes van der Linden:
"Somebody once told me there is a job in which you have to travel around the world to the shops of really expensive brands and design the shopping windows of the stores, since they have to look the same all over the world. This seemed so perfect to me, I really thought this was my vocation. Unfortunately I am now studying econometrics."

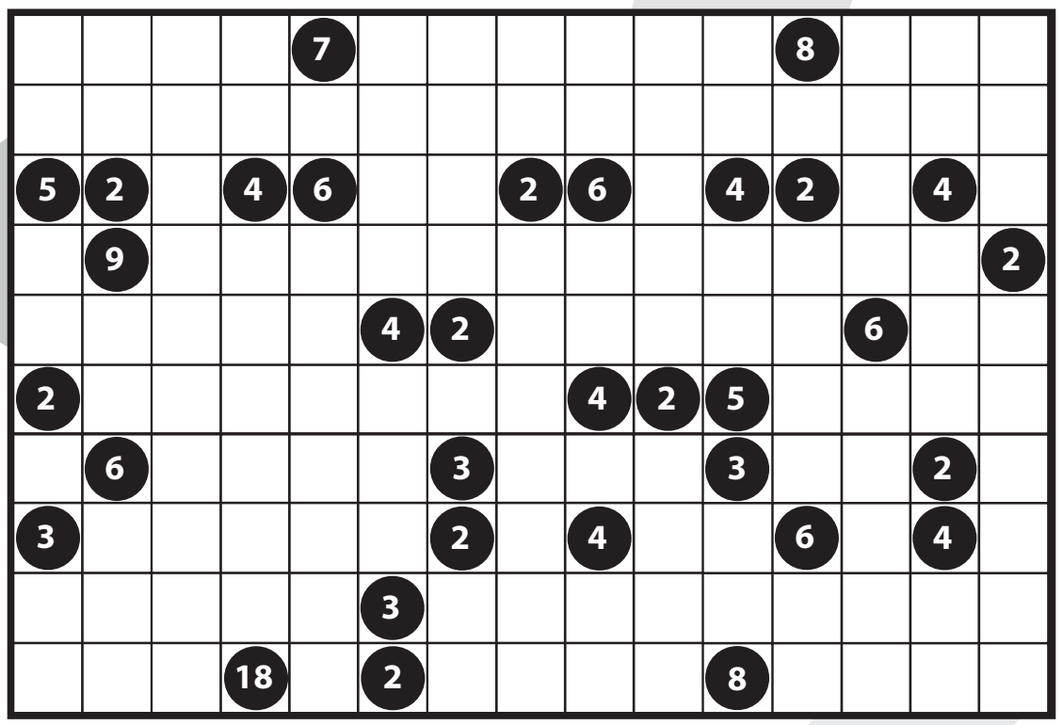
Till NEKST Time!

Do you have an interesting question or would you like to share your opinion with your fellow econometricians? Let us know via Nekst@Asset-Econometrics.nl!

PUZZLE

With spring just around the corner, imagine yourself finally again enjoying the sun outside. A lovely picture, but there is just one thing missing: another challenging Nekst puzzle! In case the cold weather stays for just a little longer, there is even a second puzzle this edition.

1. Squares and rectangles:
The aim of this puzzle is to divide the 10 by 15 square below into smaller rectangular and square compartments. The numbers depicted in the puzzle indicate how large the compartments must be. Every number needs to be assigned its own compartment, these compartments need to be non-overlapping, either square or rectangle, and consist of exactly the number of boxes as the number indicates.

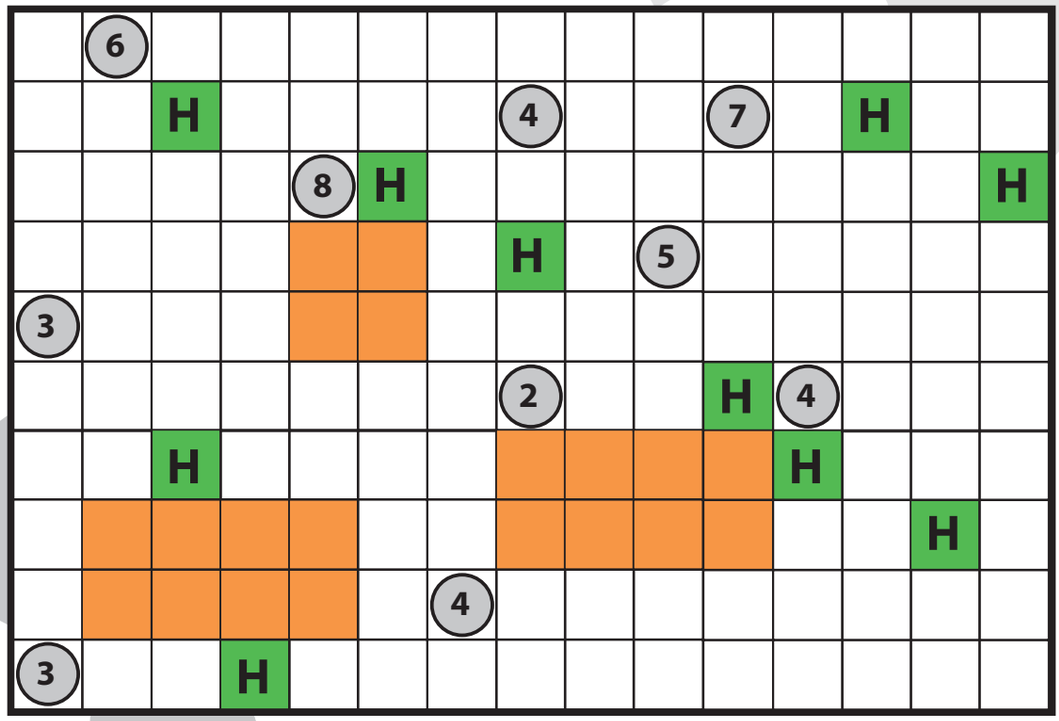


Berend Wijte is the winner of the previous puzzle.
As a reward, he can come and pick up a crate of beer or a pie at room E1.10.
If you want to know the solutions of the previous puzzle, visit www.Nekst-Online.nl.

2. Golf:
The following puzzle is derived from the game of golf. Every ball (#) needs to end up in a different hole [H] , quite rudimentary until here. The number depicted on the balls indicate how long the first shot of this ball needs to be, measured in boxes. A shot can only be in a horizontal or vertical line.

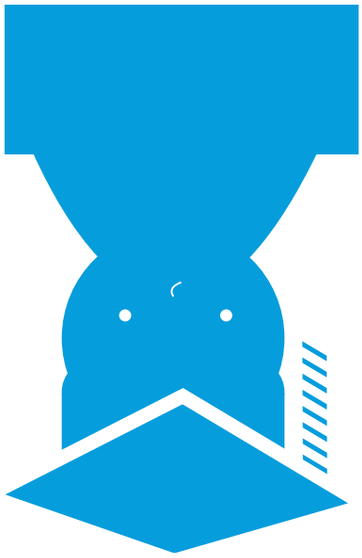
If the ball does not end up in a hole in this shot a second shot needs to be taken, every shot needs to be one smaller than the last one. So if a ball starts with a 4, and can not end up in a hole in the first shot, the next shot needs to be 3 boxes long, then 2 etc. These follow-up shots can be in the same direction as the shots before, but also in any other direction.

The deadly enemy of any good golf shot is the bunker , shots can therefore not end up in bunkers however they can be shot over them.



Can you figure out the two puzzles?
Please enter your solutions at www.Nekst-Online.nl/Puzzle. A crate of beer or a delicious pie, whichever the winner prefers, will be waiting for whoever has sent the best (partial) solutions. Please note that, as before, every recipient of this magazine is eligible to send in their solutions, so members of the department are invited to participate as well.

For elaboration visit
NEKST-ONLINE



Asset | Econometrics congratulates...

Name:	Roel Nagy
Title:	The effects of policy uncertainty on investment timing and investment size
Supervisors:	Prof.dr. P. M. Kort, Prof.dr. K.J.M. Huisman
Name:	Michael Watson
Title:	Modelling the reporting delay of individual short-tailed general insurance claims
Supervisors:	Prof.dr. B. Melenberg, Dr.ir. G.W.P. Charlier
Name:	Erik-Jan van Harn
Title:	Choice options in variable annuities
Supervisors:	Dr. N.F.F. Schweizer, Dr. A.G. Balter
Name:	Berend Wijte
Title:	Picking decision in food retail
Supervisors:	Prof.dr. G. Kant, Dr. Y. Merzifonluoglu Uzgoren
Name:	Dennis de Jong
Title:	Assessing a column generation-based algorithm for a real-life inventory routing problem
Supervisors:	Dr.ir.ing. M.J.P. Peeters, Dr. R.C.M. Brekelmans
Name:	Evelien van Moorsel
Title:	Levelling the bed demand with ward capacity - a case study at the Máxima Medical Center
Supervisors:	Prof.dr.ir. R. Sotirov, Dr. Y. Merzifonluoglu Uzgoren
Name:	Ilse Sprangers
Title:	A capacity-based construction algorithm for the split delivery vehicle routing problem
Supervisors:	Dr. R.C.M. Brekelmans, Prof.dr.ir. H.A. Fleuren
Name:	Robbert van Gaal
Title:	Network collaboration opportunities to increase the logistics performance of Royal FloraHolland members
Supervisors:	Prof.dr. G. Kant, Dr. R.C.M. Brekelmans
Name:	Stan Olijslagers
Title:	The impact of carbon transition risk on asset prices
Supervisors:	Prof.dr. B. Melenberg, Dr. A.G. Balter
Name:	Jeroen Pars
Title:	An analysis of methods that estimate the time containers are held by customers of container centralen
Supervisors:	Prof.dr.ir. H.A. Fleuren, Prof.dr. K.J.M. Huisman
Name:	Eline Verwielen
Title:	Growing N-grams: a probabilistic approach to string clustering
Supervisors:	Prof.dr. K.J.M. Huisman, Prof.dr.ir. H.A. Fleuren
Name:	Marijke Dijkstra
Title:	A planogram clustering approach to better adapt to customer needs
Supervisors	Dr. O. Boldea, Dr. J.R. de Bresser
Name:	Masum Rahman
Title:	Bid optimization in search engine advertising
Supervisors:	Dr. T. Klein, Dr. G. Knox
Name:	Belle de Veer
Title:	The prediction of conversion probability based on website behavior
Supervisors:	Dr. O. Boldea, Dr. P. Cizek
Name:	Ennia Suijkerbuijk
Title:	Optimizing tune-in with addressable TV advertising by exploiting promotional responsiveness
Supervisors:	Dr. J.P.C. Blanc, Dr.ir.ing. M.J.P. Peeters

...on obtaining their Master's degree.

Quatsch!

Dominique Bavelaar:
"Ja als je zoveel drinkt, dan is je lever wel de medewerker van de maand."

Pepijn van den Brink:
"Welke landen die beginnen met de letter i hebben geen a in hun naam?"

Jeannine Beker: "Tsjechië!"

Claire Vink:
"In de zomer moet je je weer gaan scheren. Nou ja, niet dat ik korte broeken draag, maar mijn broeken worden wel korter."

Ricardo van Belzen:
"Wat is je studentenkaart eigenlijk? Die Asset-kaart of de kaart waar je koffie mee kan halen?"

Jaron Kappers:
"En dan moet je de wortel van de standard error pakken."

Karlijn Koerts:
"Huh, moet je dan de root van de square root pakken?"

Anne de Vries:
"Oh ben jij 25? Ben jij van 1991?"

Ruud Hendrickx:
"L'Hôpital is for chickens."

Quatsch?

Over the past few months, the editorial staff of NEKST received many quotes that relate to the study of Econometrics and to the activities organized by Asset | Econometrics. Therefore, we present to you a selection of some striking and funny quotes!
Please mail all remarkable quotes you have heard to Nekst@Asset-Econometrics.nl!

Freshmen Information Day

Wednesday April 11

Are you in the first year of your bachelor's and not quite so sure what to expect from the upcoming years? Then make sure you go to the Freshmen Information Day on Wednesday April 11! The event will start with a presentation from our program director, who will give useful insights in the second- and third-year courses, after which a free lunch will be served.

Actuary Day

Tuesday May 1

On May 1, Asset | Econometrics will organize the Actuary Day of Tilburg. Here, both speakers and companies will tell you all there is to know about the field of Actuarial Sciences. The information provided will include what Actuarial Sciences actually means, the path to becoming an actuary and what an actuary's tasks are in day-to-day business.

Monthly Afternoon

Thursday May 3

On Thursday May 3, the penultimate monthly afternoon will take place. Prepare for an afternoon filled with board games, food and probably some quatsches!

Freshmen Activity

Wednesday April 18

Wednesday April 18 the last Freshmen Activity will take place. This is the last time to catch up with your fellow freshmen students! Keep an eye on our Facebook and website to make sure to be present at this event!

Informal Activity Capgemini

Wednesday April 25

On Wednesday April 25, an Informal Activity with Capgemini will take place. Get to know Capgemini outside of the context of the lecture rooms or the office!

Party for charity!

Wednesday May 2

Party with 200 liters of free beer and collect money for charity at the same time! The next Asset Party is connected with the Alpe d'HuZes foundation, which raises money to fight against cancer. With the money we are going to raise during this party, we will sponsor our two board members (Anne and Rachel) who are going to climb the Alpe d'Huez by bike.

Tuesday May 8

The traditional Astrics Beer Cantus will take place once more, this year on May 8. Make sure you register for this event and do not miss this great night of unlimited beer and pleasure.

Beer games Drink

Thursday May 17

During the Astrics Beer Games Drink, teams will battle each other to become the fastest drinkers of Asset | Econometrics. Do you already see yourself holding this trophy? Make sure to register with your team and fight to win!

FAM activity

Saturday May 26

On May 26, the activity for Former Active Members will take place. We will organize a fun activity where all our Former Active Members can catch up with each other again.

Monthly Afternoon

Thursday May 31

On May 31, the last monthly afternoon of this academic year will take place. During this activity all members are invited to meet, play games and have a bite to eat together.

Summer Activity

Wednesday June 6

On June 6, the yearly Members Day will take place. The activity is still a secret, but previous editions have proven that it will be fun for sure, so save the date!

Announcement Drink

Wednesday June 6

Wednesday June 6 the Announcement Drink of Asset | Econometrics will take place. During this drink, we will toast on the new board of Asset | Econometrics. The perfect opportunity to congratulate the new board!

Asset Champions League

Thursday June 21

Did you not get the chance to practice your soccer skills during the Astrics Sport Tournament, or are you eager to practice them once more? The Asset Champions League will take place on June 21, for which all members (both active and passive) can register.

You've nearly completed your degree, and you're ready for what's next: a job that will inspire you, make you think and put your skills to the best use.

Our unique perspective allows us to see the connections between talent, assets and ideas that can drive performance and growth. Powered by market analytics, behavioral insight and a culture of seamless execution, our colleagues work with you to design and implement lasting solutions that turn risk into a path to growth.

Together, we unlock potential.

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