



# I/O VIVAT

VOLUME 40  
NUMBER 2

**Post-Graduation Hole**

**The Double Hop Problem**

**An Incoherent Vent**  
Where Technology and Humanity Intersect

**The Conquest of the Sky**  
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**Lead the Charge for Sustainability**

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Inter-Actief



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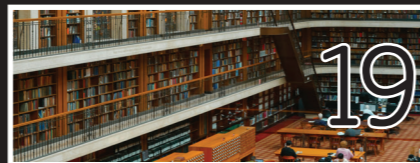
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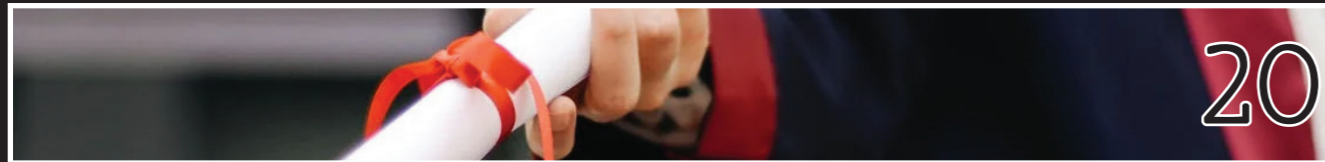
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I/O VIVAT

## //Editorial

Dear reader,

A Vivat has once again touched your digital doormat. For those unfamiliar, the I/O Vivat is the popular scientific magazine of study association Inter-Actief. It contains articles about popular science, interesting IT-related companies and columns from the programme director and the board of Inter-Actief among other things. The I/O Vivat is published once every year in physical print (1700 copies for both Inter-Actief as well as alumni association ENIAC), delivered to your doorsteps. Other editions, like this one, are shared in a digital (.PDF) format and the articles are published continuously on our digital platform (<https://ioviv.at>). Do not miss any articles by joining our platform by scanning the following QR code!



This edition includes articles about the difference between humans and machines, how you, as a tech worker, can help fight for sustainability, and how the Wright brothers pioneered the aviation industry with their knowledge of iterative design. Additionally, we have columns from some of Inter-Actief's committees, such as the 2025 Symposium committee and the Educational committee, and articles from the ENIAC board and the dean of EEMCS! After years of hard work, our former chief editors are able to reengage on writing articles, as they teach us about the Double Hop Problem and what to do when you've just graduated.

At some point you realise you have to hand over the reins to a new generation. Jelle and Ruben have been fighting for the I/O Vivat for over 2.5 years, providing new energy to the committee, trying to find a good balance between physical and digital publications, setting up our digital platform, kindly inquiring at the board how collaborations were going and, most energy-draining, trying to figure out the tariffs of PostNL. We see that our efforts have paid off, at least to some degree, in the fact that we found two eager new Chief Editors who we have not doubt in will push the Vivat to next levels. Anamaria and Erjan have already been busy in arranging and outlaying the Vivat you are currently viewing. We wish them the best of luck and you will no doubt see some articles from our side from time to time.

We thank you for reading the I/O Vivat!

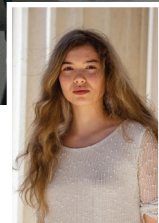
Anamaria Ceban & Erjan Steenbergen  
Chief Editors I/O Vivat

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Former Chief Editors I/O Vivat



# An Incoherent Vent

## Where Technology and Humanity Intersect



By: *Sanziana Greco*  
Editor I/O Vivat

"I don't know if the future is going to be a utopia or a dystopia. But it's unlikely to be anything in between."  
- Tim Urban

I keep thinking about that scene from I, Robot.

Detective Del Spooner: "Human beings have dreams. Even dogs have dreams, but not you. You are just a machine. An imitation of life. Can a robot write a symphony? Can a robot turn a... canvas into a beautiful masterpiece?"

Sonny: "Can you?"

And then a ton of questions flood my mind. I am putting them here because I do not want to be the only one having this existential crisis.

What makes us human? What sets us apart? Is it consciousness? Creativity? But then again, can you? Not all of us reach that level of genius - or even try to. So how did we get here? Or are we ever going to get there? To a point where we have these conversations with AI. Where there is a kind of reversed Turing test, where robots try to figure out if you are human or not.

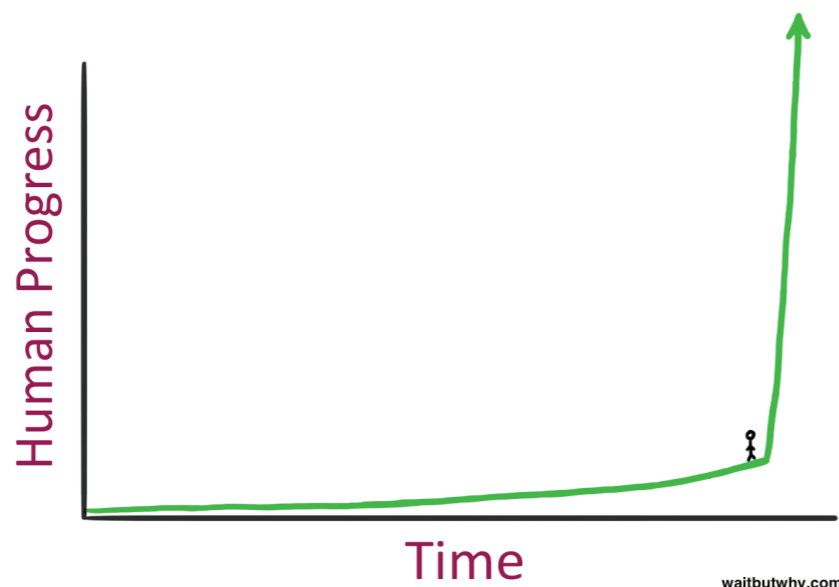
Or in another order of ideas. How has technological progress accelerated so

much? Ray Kurzweil's Law of Accelerating Returns: technological advances feed on themselves, making progress even faster. But how do we adapt to a world that is changing every second? Why are we so afraid of being replaced? Why do we even think we will be replaced? Is it because we are so young as a species, and we are still fighting with our biology, trying to find principles that don't get obsolete? Why do we even see everything through this dystopian lens? Why can't we imagine a future where we work together with technology? Like that solar punk Ghibli aesthetic. Because in the end, technology helps us become more human. Asking these questions pushes us closer to authenticity. It forces us to peel back the layers until we reach that authentic voice buried beneath our biological

evolution screaming "fit in". Nonconformity has become the new conformity.

I am not signing up for the techno-optimist manifesto wholesale, but I will borrow some highlights. I do not believe that beauty only exists in struggle or that technology must violently conquer the unknown. But I do believe this struggle - the questions, the fear, the collaboration - is where we find our humanity. Let us bring this to Pixar and Ed Catmull. Because I think it is the best example for what I am trying to say. I will probably dedicate one full article on the evolution of computer graphics because of him.

Ed Catmull is not your typical tech founder. He is not walking over dead bodies like Jobs or singing in worka-



holism like Musk. His story is quieter, more thoughtful. He is the guy who blurred the lines between art, storytelling, and technology. At the start of Creativity, Inc., his semi-autobiography, Catmull talks about his love for art - learning to draw, dreaming of becoming an animator - and how he was pulled into the world of computers. His heroes, Walt Disney and Albert Einstein, hinted at what he would achieve. And boy, did he deliver. Catmull is to computer animation what Feynman was to quantum physics. He even received the Turing Award, the computer science equivalent of the Nobel Prize. But his legacy isn't just about technology. It is about people. Catmull's technology was robust because it had a purpose: to tell stories. And that is why he is so good at drawing

practical lessons from complex ideas. Like when ARPA taught him, "When challenged, get smarter." Or how he said drawing lessons weren't about learning to draw but learning to see. One of my favorite parts of the book is when he talks about Cassandra and Apollo. Cassandra wasn't cursed. The people who could not understand her were. Is there a Cassandra among us we are failing to listen to? Maybe that is why Catmull's leadership philosophy screams failibilism: fail fast so you can correct faster. He would tell his team, "Give 'em the Toyota speech" - a pep talk more than just-in-time-manufacturing, but just-in-time learning, where the most important skill is just figuring out as you go, about candor - giving everyone the chance to be as honest as possible, focusing on the problem, not the person.

So what is the takeaway here? Technology evolves because we push it. But it is not just about the tools we build. It's about what those tools make possible. Pixar's movies do not wow us because they are technological feats. They wow us because they are human. Technology only can amplify our humanity. This paradox... the more it evolves, the more it challenges us to understand what makes us human.

And that brings us back to the questions. What makes us human? What is our place in a world where machines can do what we do - and sometimes better? Maybe it is not about what we can do but why we do it. Maybe it is about the stories we tell and the connections we make. Our beliefs, and opinions.



Figure 3: Edwin Catmull: Co-founder of Pixar

Maybe it is about peeling back the layers to find that authentic voice that makes us who we are. About what we can create together. We do not have to prove anything anymore. Amor fati.

### Edwin Catmull

Edwin Catmull is an American computer scientist, as well as an animator who is known as the co-founder of Pixar and as former president of Walt Disney Animation Studios. In the computer science field, he is renowned in the 3D computer graphics sector for pioneering the method of texture mapping, along with algorithms such as the Catmull-Rom spline and the Catmull-Clark subdivision surface. Due to these findings, he received the Turing Award in 2019.

### Cassandra

Cassandra, a Trojan princess, was gifted with the power of prophecy by Apollo. However, when she rejected his love, he cursed her so that no one would believe her predictions. Despite accurately foreseeing events such as the fall of Troy, her warnings were dismissed, leaving her helpless to prevent disaster.



## From the ENIAC Board

### A Year in Review: Behind the Scenes at ENIAC



By: Josje van 't Padje  
Chairman ENIAC Board

**A**s the year comes to a close, it is the perfect time for a little reflection. For those of us unfamiliar with ENIAC, the alumni association for Computer Science and Business and IT, it's also a great opportunity to take a peek behind the curtains and see what we have been up to. From social gatherings to professional events, let us walk through some of the highlights of our year!

We kicked off the year with two drinks and a General Members Meeting (GMM) in the first quarter. Our first drink took place in Enschede, a city we all know and love. The second one was in Utrecht, conveniently located in the center of the Netherlands and home to many alumni. Therefore this event was a hit, as always. Organizing drinks is simple: finding a venue, making a reservation, and spreading the word. A GMM, on the other hand, requires more effort since we need to prepare our GMM documents and need to secure two locations – one for lunch and another for the activity, which may sometimes be at the same place.

In late May, we hosted our first graduation speeddate of the year. This event is designed for master students looking for a graduation project at a company. The organization begins a couple of months in advance, as we reach out to the board of *Inter-Actief* to arrange a venue where we can hold the speeddates, presentations, and a post-event drink.

In the past, we often used the Educafé, but due to an increasing number of drinks, we've had to look for other options. This year, we hosted the event at SmartXP, which turned out to be a great alternative. Around the same time, we begin contacting companies to gauge their interest in participating. Many of these companies send alumni that also studied at the UT, and it's always a pleasure to see them return for these events. They make the event more meaningful for both the students and companies by understanding the needs and demands of the students.

About a month before the speeddate,

we ask study advisors from Computer Science and Business & IT to post an announcement on the Canvas page, and *Inter-Actief* adds the event to their website. Since we host the speeddate in two rounds, we can invite a little over twice as many students as we have companies. As you can imagine, this requires a bit of balancing to ensure the right ratio of companies to students as the companies and students sign up for the event. For our first event, the number of participating companies was lower than expected, so we opted for three rounds instead of two to accommodate more students.

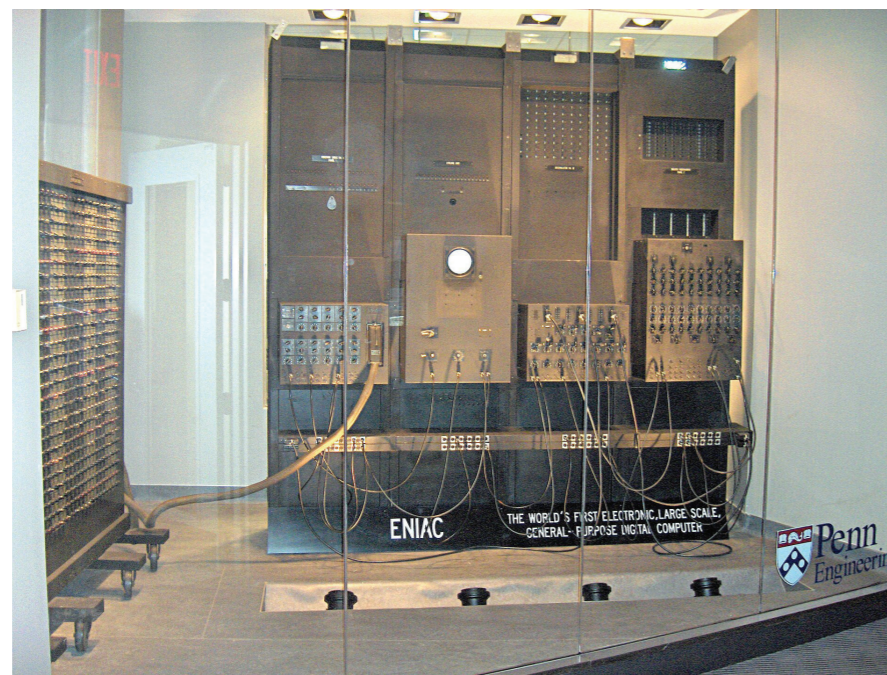


Figure 1: ENIAC computer, the namesake of the association.

The evening starts with a walking dinner, followed by a brief pitch from each company to introduce themselves to the students. This allows us to save time during the speeddating rounds, where students rotate between tables and spend five minutes with each company. Meanwhile, other groups of students are entertained with a presentation from the ENIAC board, where we share our personal experiences of the graduation process at the university. After the speeddate rounds, we check if there's mutual interest between students and companies. During the after-party, students and companies can discuss their results and reflect on the event. Within a week, we send contact details of the successful matches to both parties so they can follow up directly.

Before and after the summer break, we organized two major activities, of which one for families with children. The first major event was a visit to the Puik Brewery in Apeldoorn. Puik is a cozy taproom where we got an inside look at their brewing process. One thing that stood out was how they mainly bottle beer in kegs rather than bottles, preferring to serve fresh beer at their taproom over selling bottles. Puik also loves experimenting with flavors, which results in a diverse range of seasonal beers. After the tour, we enjoyed a beer tasting and had a great time socializing, with some of us staying for dinner afterward.

Our family activity this year was a day at the Efteling theme park. This event

is always popular. Everyone is free to do their own thing. Some people prefer to wander through the park with other alumni, while others go solo or with their family. We arranged a meeting time for the group lunch for those interested, and a lot of the participants showed up to enjoy a sandwich together before splitting up into their own groups again. It's a day where you can do whatever you like – no pressure!

Later in the fall, we took over *Inter-Actiefs* Friday afternoon drink. This event had an extra special vibe, as members from Ianus, the old board dispute of *Inter-Actief*, were also attending, making it a great opportunity to reconnect with both current and former students of the association.

Finally, last month marked our second graduation speeddate of the year, where another batch of students had the chance to find a graduation assignment. We had also hoped to host another borrel in Leiden, but due to low sign-ups, we had to cancel it. However, we're excited to kick off the new year with a borrel in Utrecht in January, and we hope to see many of you there! We're still planning what to do for the rest of the next year, but we usually publish the full year agenda on our website pretty early into the year, so keep an eye out!

As we look back on this past year, we're proud of all that we've achieved and grateful for the vibrant community we've built together. Looking ahead to the



Figure 2: ENIAC activity (family Activity) at the Efteling.

new year, we're excited about the opportunities and events yet to come. We hope that 2025 brings new connections, memorable moments, and exciting opportunities for all our members. Here's to another year of growth, collaboration, and fun! Wishing everyone a successful and fulfilling year ahead! See you at the drink in April!

## ENIAC

The ENSchedese Informatica Alumni Club - ENIAC - is the alumni association for computer science, business information technology and related fields of the University of Twente. The ENIAC board of 2024 consists of Josje, Koen and Kevin.

Are you about to graduate but not yet a member of ENIAC? Membership starts from only € 5,- per year. As a member you will receive the *I/O Vivat* published to stay close to your academic roots and *Inter-Actief*. You are invited to all organized events. Most of these events are free to join for members and you are even allowed to bring friends outside of ENIAC/*Inter-Actief*. Even more important, it helps you stay connected with your roots and students from your time at the University of Twente!

## Activities

- 4 April - Drink - Enschede (City)
- 14 May - Graduation Speeddates
- 23 May - Drink - Utrecht
- 14 June - Large Activity
- 13 September - Family Activity
- 26 September - Drink - Leiden
- 11 October - Online Activity
- 12 November - Graduation Speeddates
- 21 or 28 November - Drink - Enschede (Campus)
- 13 December - Budget GMM 2026
- 16 January - New Year's Drink (Utrecht)



## Lead the Charge

### Tech Workers Fighting for Sustainability



By: Barbara Kump

Associate Professor Behavioural, Management, and Social Sciences UT

The tech industry has long been at the forefront of innovation, but in recent years, another movement has been growing within its ranks: employee activism [1]. Employee activism means that employees are using their voices to advocate for meaningful change within their companies. This spans a range of ethical issues, from data privacy and misinformation to labor rights and workplace discrimination. One of the most pressing concerns, however, is environmental sustainability, as these employees recognize that their companies hold immense power to influence global environmental policies.

Despite current setbacks related to the re-election of Donald Trump as US President [2] employee activism remains a powerful force in the fast-paced tech world. Let us have a look at some recent initiatives and achievements of tech workers fighting for sustainability before I provide some guidance on how to become an employee activist for sustainability in your own company.

It is no secret that corporations play a significant role in climate-harming emissions and environmental degradation. However, they also hold immense power to drive meaningful change [3]. Unfortunately, most companies have failed to take decisive action. This is where employees step in. For about 50% of Millennials and Gen Z, climate change is a major concern that influences

their career choices, and they are looking for ways to change their companies for the better [4]. In particular, in North American tech companies, employees are organizing, mobilizing, and pressuring their employers to take action on sustainability.

For example, take Drew Wilkinson, a former punk band leader turned Microsoft employee, who co-founded the company's sustainability community which comprised over 10,000 members by 2023 [5]. Similarly, Google's Zoe Samuel helped launch the Anthropocene grassroots climate solutions community, which now boasts more than 4,000 members working on initiatives like Google Sunroof, a project that promotes solar energy adoption [6].

On the more radical end, former Amazon employees Maren Costa and Emily Cunningham took their activism beyond internal advocacy [7]. Frustrated by their company's lack of action, they helped organize a walkout of 3,000 Amazon employees worldwide and publicly criticized Amazon's climate policies at the 2019 Fridays for Future demonstration in Seattle. Their efforts contributed to Amazon's decision to announce its Climate Pledge, committing to 100% renewable energy by 2030 and net-zero carbon operations by 2040.

Then there are whistleblowers like Frances Haugen, who in 2021 exposed Facebook's internal documents revealing the company's awareness of its role

in spreading misinformation, including climate-related falsehoods [8]. Similarly, Stuart Johnson, a senior engineer at Volkswagen, informed U.S. authorities about VW's emissions fraud, shaking the German automotive industry to its core [9].

It's no coincidence that many of these activists come from tech companies. Many employees in the industry live in progressive areas, have democratic values, and join their companies with the belief that technology could be a force for good. However, as they witness corporate decisions prioritizing profits over societal benefits and planetary well-being, many have become disillusioned. Tech workers—often well-paid, highly skilled, and deeply embedded in their companies' core operations—have both the leverage and the motivation to demand change.

#### How to Become a Tech Worker Employee Activist?

As a tech professional, you have the opportunity to be part of this movement and become an employee activist for sustainability yourself. If you are ready to take action, here are key strategies to make your efforts impactful (see [10] for detailed theoretical basics and research on the matter).

**Build a team:** No matter how ambitious your goals, you do not have to go it alone. Building a team helps distribute the workload, provides emotional

support, and strengthens resilience. A collective effort is harder to ignore and more likely to achieve lasting change. Surround yourself with like-minded colleagues who share your vision and can help strategize, celebrate successes, and navigate setbacks together.

**Identify Issues Worth Fighting For:** Identify relevant causes to fight for in your company. These are often the ones where your business has the strongest negative environmental impact. However, not all issues are equally easy to tackle. Some initiatives offer quick wins that build momentum, while others, such as reducing a company's carbon footprint or changing hiring policies, require long-term commitment. Focus on balancing feasibility and effectiveness. Early wins can generate credibility and confidence, paving the way for larger, more complex changes.

**Understand Power Dynamics:** Tech companies are driven by both formal structures and informal influence. Knowing how decisions are made—and who holds the power—can help you craft a more effective strategy. Some initiatives may gain traction by working within existing systems, while others may require pushing boundaries or challenging the status quo. Recognizing when to negotiate, when to escalate, and when to push back is key to making an impact.

**Be Creative:** Employee activism has no one-size-fits-all playbook, so thinking outside the box is essential. Look for innovative ways to engage colleagues, mobilize resources, and create compelling narratives that drive action. Whether it's a grassroots petition, a well-researched proposal, or a high-profile internal campaign, tailor your approach to your company's culture and unique challenges.

**Win Over Decision-Makers:** Executives and managers have a major influence on company policy, so gaining their support can accelerate change. Decision-makers respond to different tactics—some to data-driven arguments, others to employee pressure, and some to external reputational concerns. Frame your advocacy in a way that aligns with their priorities, and always come prepared with solutions, not just problems.

**Practice Persistence:** Change rarely happens overnight, and setbacks are inevitable. Stay grounded by keeping clear priorities, gathering strong data, and remaining adaptable. Regularly take a step back to assess your progress, refine your approach, and ensure your company isn't leading you in circles without real action. The ability to stay the course while adjusting tactics is crucial for long-term success.

**Build a Broader Support Network:** Beyond your immediate team, a larger network of supporters, inside and outside the company, can provide additional strength and stability. Engage with industry groups, advocacy organizations, and professional networks that share your goals. A movement that extends beyond your company creates accountability, making it harder for leadership to ignore your efforts.

**Take Care of Yourself:** Balancing a demanding tech job with activism can be exhausting. While driving change is rewarding, burnout is real. Make sure to set boundaries, find time to recharge, and seek support when needed. Sustainable activism requires sustainable activists: your well-being is just as important as the cause you're fighting for.

The fight for a sustainable future is not just happening in government negotiations or activist protests; it is happening

right inside the offices of the world's biggest tech giants. And it is being led by tech workers who act in line with their values. By building a strong team, understanding corporate power structures, and maintaining persistence, by becoming an employee activist, you can help shape a more responsible and forward-thinking industry.

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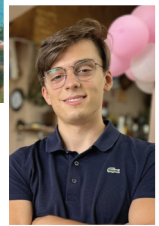






# The Conquest of the Sky

## A Story of the Wright Brothers' Iterative Breakthrough



By: Filip Karkalasev  
Editor I/O Vivat

In the early 20th century, as Europe buzzed with the promise of technological advancement, two brothers embarked on a journey that would change the world forever. The story of Wilbur and Orville Wright is one of relentless innovation, fueled by the principles of iterative design - an approach that modern computer scientists and engineers might recognize as akin to agile development methodologies such as Scrum.

The Wright brothers' journey began with a simple childhood observation: when you stick your hand out of a moving car's window and tilt it, the air pushes it up or down. This basic interaction with aerodynamics sparked a revolutionary idea. By altering the angle of surfaces in the airstream, one could control flight. With this foundational concept in mind, the Wright brothers set out in 1899 to create a controllable flying machine.

### 1900 Glider

The first significant prototype in their quest was the 1900 glider. The brothers understood that controlling the aircraft would be the most challenging problem. While the principles of lift and propulsion were somewhat understood, control was largely unexplored. Their glider featured a horizontal elevator, or canard, positioned in front of the wings. This unique design aimed to maintain the glider's center of pressure at its cen-

ter of gravity, crucial for stable flight. The elevator could tilt to control ascent and descent, providing a rudimentary but effective mechanism for aerodynamic control.

### 1901 Glider

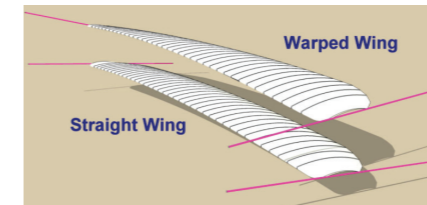
Despite their innovative design, the 1900 glider fell short of expectations. It provided less lift than anticipated. Determined to improve, the Wrights returned to Kitty Hawk, the town where the brothers tested flights with their first glider, with a larger glider in 1901, boasting a 7-meter wingspan. However, this too underperformed, achieving

only one-third of the expected lift. This setback did not deter them; instead, it spurred further experimentation.

### 1902 Glider

The brothers' willingness to challenge established norms and their commitment to empirical research set them apart. Initially, the brothers performed a literature study to find out the state of aeronautical knowledge, reading about the works of famous scientists and engineers at their time. For example, there was a lift equation that had been trusted for a century. However, their own experiments revealed many accepted

theories were incorrect. So, to solve the problems they were facing, of which aircraft control was the most crucial and hardest, they had to come up with their own theories. One of the mechanisms they developed was their patented 'wing-warping' mechanism for control in roll (rotation around the front-to-back axis), which involved twisting the wings, literally twisting them, like how the wings of a bird are twisted:



They also tackled the issue of adverse yaw - where the nose moved oppositely during turns - by adding movable tails. All these modifications allowed for better stability and control during flight. With these mechanisms in place, in 1902, they introduced a new glider with a 10-meter wingspan, capable of controlled glides up to 90 meters.

### The Leap to Powered Flight

1903 Flyer: The ultimate goal was po-

wered flight. To achieve this, the Wright brothers needed propellers and a motor. Without an existing mathematical framework for propellers in aviation, they built a wind tunnel to develop their own theories. When they could not find a manufacturer to produce a suitable motor, they created one themselves. These efforts culminated in the 1903 Flyer, which on December 17, 1903, achieved the first powered flight, covering 36 meters in 12 seconds. This monumental event marked the birth of aviation.

### A Legacy of Iterative Design

The Wright brothers' meticulous testing and data-driven approach highlight their remarkable ingenuity as both scientists and engineers. They demonstrated that through iterative prototyping - building, testing, failing, and refining - extraordinary breakthroughs are possible. This process, fundamental to their success, is a principle that resonates profoundly in today's era of rapid technological innovation.

Fast forward to the present, where technology pervades every aspect of our lives, the iterative process remains crucial. Einstein modestly said, "It's not that I'm so smart, it's just that I stay with problems longer," a quote with an underlying gravitas, ever crucial in the fast-paced, immediately rewarding world of today. It touches on the fundamental idea that it is iterative persistence that

drives the continuous improvement of prototypes, leading to world-changing inventions that push humanity forward, unite us globally, and make the seemingly impossible possible.

### Costs of flying

The Wright Flyer cost the brothers less than \$1,000 (about \$28,000 in today's dollars) to construct, which they earned through profits from their bicycle business (Wikipedia).

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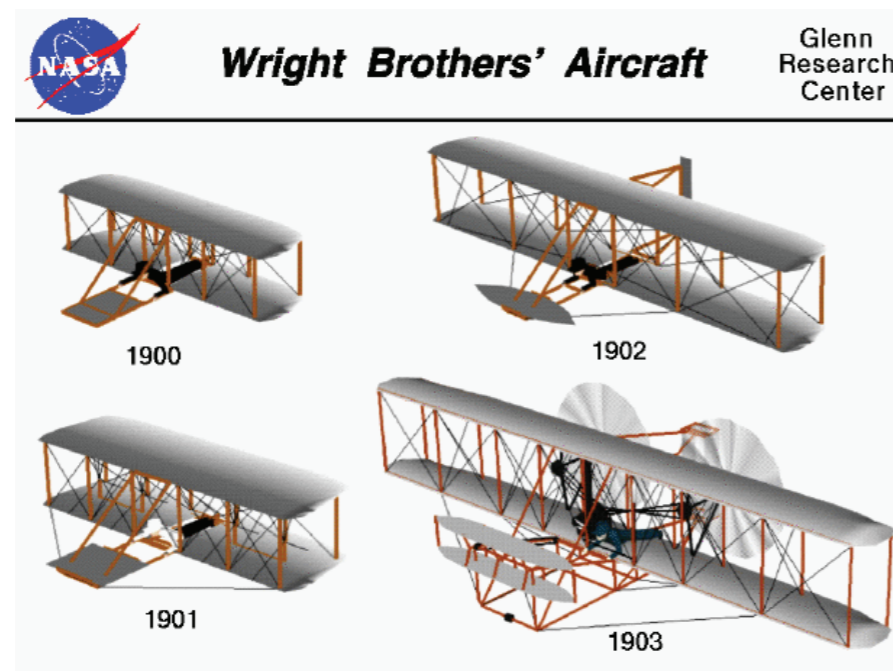


Figure 1: Prototypes of different gliders of the Wright brothers.

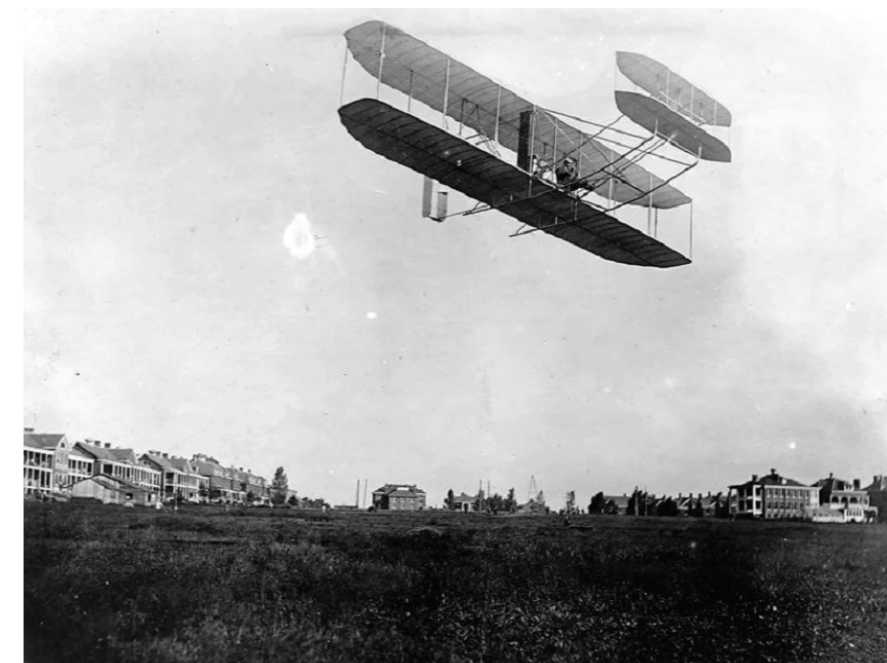


Figure 2: Footage of Wright brothers' first successful flight.



## Symposium Sentinel

What did you miss?



By: *Jeske van Hijum & Erjan Steenbergen*  
Symposium Committee & Editors I/O Vivat

**O**ne of the best-known traditions of Inter-Actief is the Symposium, which is held annually on a specific topic within the wide field of Computer Science. The Symposium attempts to provide students with detailed information on a specific topic and introduce them to companies that are active in the same. This event provides an excellent overview of the various career paths in the sector.

Throughout the day, there are a number of speakers who talk about subjects relating to the chosen theme, giving students a chance to study the field in detail. In between talks, students get a chance to meet professionals from the field in one-on-one sessions, discovering what they do and learning about careers in the industry.

This year, the Symposium Sentinel was held on the 4th of March right here on campus. The symposium is themed around the importance of IT systems in public safety. The symposium is named after the noun "sentinel", meaning a soldier or guard whose job it is to stand and keep watch, which follows the role that IT fulfills in the domain of public safety these days. In our society, IT systems are almost impossible to take out of the equation. It is everywhere: the systems surrounding control rooms, GPS to pinpoint locations of incidents to dispatch emergency officers as quickly as possible, or body cams for police to record

incidents and keep them and other people safe. All of the given examples are quite hands-on, but when talking about public safety, we can also mention the health, transportation, and banking domains. In all of the aforementioned domains, there are IT systems that work their magic in some way or another to keep us all safe and our society functioning. The symposium brings together experts from different sectors and creates an environment where everyone can experience depth in a field that they are interested in.

We have invited speakers from all corners of the industry. The symposium started incredibly strong with two insiders from Team High Tech Crime (THTC). The talk showed us how they seized several big botnets, such as IceDID, Smokeloader, Bumblebee, and Pikabot, from their operation called Endgame. These botnets are malicious software that installs malware on target-

ed systems. After a botnet gets seized, Endgame tries to persuade the criminals to give themselves in or help them find any higher-ups in those criminal organizations. Additionally, they have an open Telegram chat where people can send in any tips or hints. Occasionally, competing botnet admins reveal other botnet admins in those chats, but if it is not a tip, it is most likely a cat GIF.

The second talk of the day was given by Maurice van Keulen and Shreyasi Pathak about their research on using AI in practice to predict breast cancer. Shreyasi started off by telling us about the difference between petri-dish AI versus reality-centric AI. The main focus of Maurice, Shreyasi, and their team was to develop a model that could predict breast cancer and that could also be used in real-life situations. To develop such a model, they needed to use real-life data from the hospitals. Of course, this is extremely sensitive data, so the

team developed a special model-to-data system in which they brought the model to the sensitive data so that the data never had to leave the hospital. Another important feature of a real-life model is that it needs to be explainable since else it is harder to use in real life. All of these constraints make it quite difficult to build a model that is trusted by everyone to give them medical advice, but Shreyasi said they were well underway in building a reliable model. The speakers ended their talk by saying that this is still an ongoing project, so anyone who wants to do their research project or thesis for them is very welcome to.

The following talk was held by Ruben Groot Roessink, one very familiar with Inter-Actief, and, if not more, with cybersecurity. Using his expertise, he showed us the current status of cybersecurity in operational technology (OT). OT covers various parts of important physical infrastructure, including valves, pumps, control systems, and sensors. These solutions can be used in power plants, water purification systems, and more. The cybersecurity in these systems, however, is often quite primitive. This is quite interesting, as you would expect such critical infrastructure to have robust security, be it physical or cyber. The reason for this is that new equipment and infrastructure are very expensive. Besides that, they already work. Ruben further showed us some examples of OT attacks that have happened in the past and luckily through these experiences, a worldwide trend is developing such that OT will be more cyber-safe in the future.

Ruben was followed by another well-known Inter-Actief alumnus, Jotte Sonneveld. Jotte currently works at Eye Security, who focus on the cybersecurity of small to medium businesses.

He presented the current digital threat landscape in cybersecurity. predominantly, there are three types of threats in cyber: Espionage, financial motivation, and hacktivism. For businesses, financially motivated hackers are primary targets to defend against. Jotte further discussed common methods by which hackers get access to systems. Current cybersecurity methods are so sophisticated now that the real bottleneck is people themselves. Social engineering methods such as phishing and fake CAPTCHA are the main methods for gaining access to systems and installing ransomware. Jotte's take-home message is that the most crucial improvement you can apply in your cybersecurity is monitoring.

The last talk was given by Anouk Veldhuis and Daniëlle Ekkel from the AI Lab, which is a collaboration between the MST and ZGT. The AI Lab uses data gathered from the hospital, like appointment data, to improve care and make care more accessible for everyone. One example they gave in their talk was the analysis of appointment data to predict whether someone would be a no-show and remind people of their appointment based on whether they had a high chance of being a no-show. Studies showed that this resulted in a significant reduction in the number of no-shows, which meant that doctors could use their time a lot more productively instead of waiting for patients who were never going to show up. The talk ended with a few very interesting statements about AI and their use in practice in which we were encouraged to participate in the discussion. It was nice to end the day with a talk in which we could hear everyone's opinions on the use of AI and was definitely an eye-opener for some of us.

We as the Symposium Committee look back on the symposium as a successful and very educational day and we hope everyone who attended had just as much fun as we had.

## Symposium

We are currently looking for committee members for the 2026 symposium. If you are interested in joining a larger committee at Inter-Actief and organising one of our most engaging study and career-oriented events, we invite you to email us at [board@inter-actief.net](mailto:board@inter-actief.net).

Even if the committee is already complete, you can still express your interest. There may be opportunities to assist in the preparation as a committee member, or you could become an activist on the day of the event.





# The Double Hop Problem



By: Ruben Groot Roessink  
Editor I/O Vivat

Enterprise environments worldwide rely heavily on Microsoft's Active Directory (AD). In simple terms, Active Directory provides central server(s) that contain a database of all user and computer objects within a domain. This enables centralized management and provisioning of users. For example, it allows you to log in using your domain credentials on a flex working computer that you've never used before.

The latest versions of Active Directory utilize the Kerberos protocol (MIT, 1989), of which Microsoft implemented its own version. Battle-tested and extensively analyzed, the original Kerberos protocol provides secure mechanisms for authenticating to other services in a network after a user has been initially authenticated within the domain.

The Kerberos protocol is actually quite simple (for the dedicated reader, you find more information about the protocol at [1], which is out of scope for this article).

The first two steps are performed whenever a user logs into their computer using username and password:

1. A Ticket-Granting Ticket (TGT) is requested from the Kerberos Domain Controller (KDC). A new TGT is also requested if the previous one expires (usually every 10 hours, but with a maximum of 10

years in Microsoft's implementation).  
2. A TGT is returned by the KDC after several security checks.

Later, the user might want to use an internal web application, for instance, to register their hours. To provide a seamless user experience, authentication to the internal web application is also performed using Kerberos:

3. The user contacts the KDC again to request a Ticket-Granting Service (TGS) ticket for the web application, supplying his TGT in the process.
4. A TGS is returned by the KDC after performing several checks.
5. The user then uses his TGS to authenticate to the web application (referred to as the 'Resource Server' in the image).

6. The Resource Server either accepts or denies the request based on the user's permissions, and further communication between the user and the web application proceeds.

It is also noteworthy that a server in Microsoft's Kerberos implementation exposes several services to users, including:

- CIFS (Common Internet File System) service provides users access to the file system of a Windows server.
- HOST service grants users access to Scheduled Tasks on Windows servers.
- MSSQL service gives access to database service.

While the original Kerberos protocol provides secure authentication mechanisms, attack paths within a Ker-

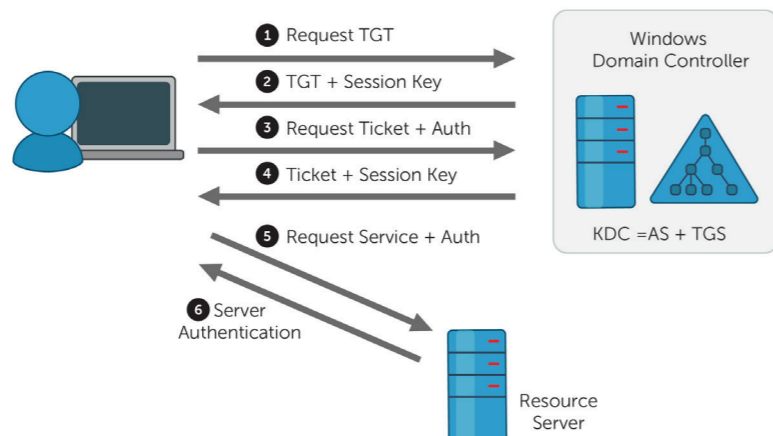


Figure 1: Kerberos Authentication Protocol.

beros-enabled are still possible. For instance, in Microsoft Active Directory environments attackers can steal TGTs and TGSs from other users, either from memory (in Windows) or from files (in Linux, which can also be joined to the Microsoft Active Directory). These stolen tickets can then be abused by a malicious actor to authenticate to different services in the network, impersonating other users.

## Double Hop

The Double-Hop problem arises from the practical need for users to have their authentication seamlessly usable across multiple connections. A common example is a user authenticating to a web application that, in turn, needs to authenticate to a database on another machine, using previously provided credentials, to access only services that that user is authorized to access. For example, a user should only be able to request their own previous timesheets, not those of other users.

## Unconstrained Delegation (UD)

Microsoft initially proposed UD in 2000 as a solution to the Double-Hop problem. When a service is enabled for UD, the frontend service (application tier) can act on behalf of a user to the backend service (data tier). To achieve this, the user requests an additional "Forwardable" TGT from the KDC, which it then sends to the frontend service along with its other authentication requests. The frontend service, in turn, uses this Forwardable TGT to request a TGS for authentication to the data tier.

However, this implementation has significant drawbacks because UD places no restrictions on the Forwardable TGT. Consequently, instead of being limited to authenticating to the data tier, the application tier can authenticate to any service in the domain. Attackers can exploit this by compromising a sys-

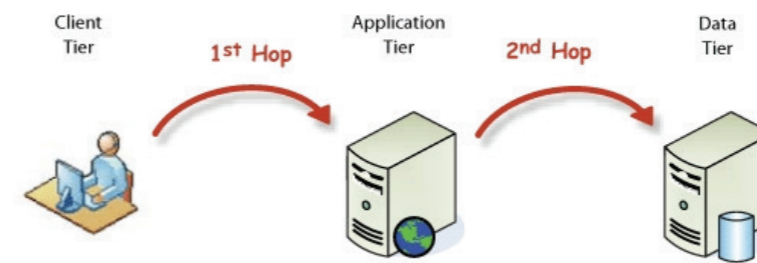


Figure 2: Double Hop

tem with UD enabled and then waiting for (or tricking) highly privileged users into connecting to it. This allows attackers to use the Forwardable TGT to move laterally from the frontend service to critical servers in the domain, depending on the permissions of the user that connected to the frontend service.

## Constrained Delegation (CD)

CD, introduced in 2003, was designed to address the vulnerabilities of UD. It limits the scope of the delegation by explicitly specifying in the domain which specific services the frontend service is allowed to delegate to (e.g., the MSSQL service on the data tier server). Since this functionality is not natively supported by the original Kerberos protocol, Microsoft implemented two extensions: S4U2Self and S4U2Proxy.

The frontend service first uses S4U2Self to request a TGS as any user to itself from the KDC. Then, still impersonating the user, it uses this TGS along with S4U2Proxy to request a TGS specifically for the backend service. While this represents a significant improvement over UD, certain attack paths from the frontend service to the backend service remain viable. This is primarily due to two factors:

A compromised frontend service can request the two TGSs as any user in the domain, including highly privileged accounts like Domain Administrators (DA).

The Service Principal Name (SPN) of the target service is not encrypted within the requested TGT. This potentially allows attackers to specify any service on the target machine.

For instance, if the frontend service is compromised, it can request a TGS as the DA and authenticate to the CIFS service instead of MSSQL on the data tier. This would grant the attacker or

malicious user the ability to read and modify any file on the Windows server hosting the data tier.

## Resource-based Constrained Delegation (RBCD)

Typically, only highly privileged users such as Domain Administrators can enable (Un)constrained Delegation. To delegate these privileges more granularly, Microsoft introduced RBCD in 2012. In this mode, instead of registering the backend service on the frontend service object, the frontend service is specified on the backend service object within the domain. The frontend still utilizes S4U2Self and S4U2Proxy to authenticate as a user to the backend service. However, a similar attack path to CD works for RBCD as well.

## Conclusion

Although delegation attacks require significant initial compromise to be exploitable, they represent a potential threat that system administrators must be aware of. These attacks can create attack paths within an Active Directory environment that are not immediately obvious. Over the years, Microsoft has proposed various solutions to the Double-Hop problem, each addressing the issue to varying degrees while simultaneously introducing new risks and attack paths.

Active Directory has been under continuous development for a quarter of a century. While many security considerations adopted by Microsoft in the past are now outdated and no longer considered secure on a theoretical level (e.g., MD4, RC4), it's understandable that Microsoft cannot simply issue a comprehensive software upgrade to every Active Directory environment worldwide due to backwards compatibility concerns. It is not in Microsoft's business interests to potentially disrupt the environments of entire corporations. The viable path to secure Active Directory environments is for Microsoft's clients to invest adequately in prevention and security monitoring.

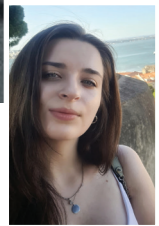
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[1] [https://en.wikipedia.org/wiki/Kerberos\\_\(protocol\)](https://en.wikipedia.org/wiki/Kerberos_(protocol))



# A day with the dean of EEMCS

## Interview with Boudewijn Haverkort



By: Anamaria Ceban, Eva van Laar, Daan van Kats  
Editors I/O Vivat & Ideaal

Boudewijn Haverkort  
Dean of EEMCS



**F**rom October 1st, the Faculty of Electrical Engineering, Mathematics and Computer Science has a new dean: Boudewijn Haverkort. Although he has worked hard as a Dean at Tilburg University, Haverkort is not new to our faculty. He has been active at the Department of Computer Science for many years before leaving in 2018 for a position at Tilburg University.

### Introduction

My name is Boudewijn Haverkort, I'm the new dean of the faculty for Electrical Engineering, Mathematics and Computer Science. I'm a computer scientist by training and I have worked at various universities in the Netherlands and also in Germany. I'm married and I'm a father to a daughter and a son. Both of which are former students, one of this university and one of a music arts school.

I studied Computer Science here in Twente starting in 1982, the second year of the study programme of Computer Science. I belonged to the second generation. The first generation had 17 students or so, and the second had 175. At that time there was no separation between the bachelors and masters. You just had the engineering degree and subsequently, I received my PhD here as well in 1991.

If you look at my LinkedIn, you'll see that I am fascinated by technology, but

inspired by the arts. So I'm really interested in art, especially modern art, literature, modern music and I'm an active sportsman. I run, swim and cycle, so I do mini triathlons. And I like a lot of walking, just the great outdoors with my dog or with my family.

I have a very broad interest. If you would look at my publications, you'll see that I've done things related to electrical engineering and computer and communication system design, but I have also worked on data science and decision support, things that mathematicians do. What interests me most is actually the fact that we as faculty are working on systems (hardware and software) that really make a difference in the outside world. The systems that we work on really have changed the way cars are being



driven, manufactured and shipped, administrative processes, etc. That's what interests me most. It's the impact that we make with computer equipment, programming hardware, decision support, AI and so on.

### Responsibilities of a Dean

In essence, the dean is the chairman of the board of the faculty. The board consists of four people. The vice dean of education is responsible for the educational programmes. The vice dean for research is responsible for the research and there is also the managing director for the operational tasks. The job of the dean is to bring all these branches together. I'm involved in all of these things, and in the end, my voice is important in the decision-making.

What I am trying to do is to bring a certain spirit to the faculty about how we approach things. To me, that means, for instance, that I'm very focused on collaboration within the faculty, but also with the other faculties and with the outside world. I think we should be inspired by real world challenges such as climate change, healthcare and poverty. We can use the technologies available in our faculty, in order to help approach these challenges.

A dean needs to be good at listening, being quiet, balanced, and they must know when to make the exception. They should try to bring peace and quietness within the faculty. There are a lot of things happening around us and within the university. It's important to be aware of that, but it's also important to keep the final goal that you have in mind and not be distracted too easily. You need to focus on the long term goal and for the faculty that is educating the next generation of students such that they learn the things that bring them further in society and in such a way that they contribute to society.

### Current and Future Goals

For the current academic year I'm working on continuing to do the things that we are already doing well. That is an important point but that is only until the summer. I also want to have conversations within the faculty about other things that we can do and also be a little critical to ourselves. What are we doing within the faculty and certain study programmes? Are they still fit for purpose? Are there other opportunities for new study programmes? Are there opportunities for our programmes, or in connection with other faculties?

You'll probably know that the university has selected a number of impact domains, climate, chip technology, health and safety & security. We, the board, want to make it clearer what everyone is doing in relation to these impact domains. In the end, I think it's good that in the course of next year we have a stronger pronounced vision of where we want to head to with our faculty.

It is also incredibly important to look further into the future. If you stop innovating, you sort of become less relevant. We do a lot of things, topic-wise, very



well, but I think adding a little bit of this energy towards innovation of ourselves and our organisation is what is needed in order to remain relevant as a faculty and as a university. So I have that ambition for our faculty, but also for the university as a whole. Our university, like most universities in the Netherlands, has to look carefully at how we've been working, and what our priorities should be, since budget cuts are threatening. So we have to know better than we know now explicitly where we want to head to.

### Collaboration with Study Associations

I do know all the study associations by name. I actually visited the building where some of the study associations are housed, and I walked in there during a lunch break and I had a chat with someone I don't recall their name. They said: "Well, it's great that you're here, we do not often see a dean over here." I think study associations are very important because they bring comfort to students. They form a home for students, a mixed student population, so that is very important. What I did in Tilburg, I had at least once or twice a year a conversation over lunch with the chairpersons of the study associations to hear how they were doing, what they would need, or how we could help or how they could collaborate. That is something that I think I will do here as well.

During my own studies, I was a member of *Inter-Actief* and I was one of the founders of the alumni association ENI-AC. I also guided one the first Japan trip

of *Inter-Actief* in the early 1990s and that was a great experience, so I have good memories of my own study association. They play an important role.

### Differences between Enschede and Tilburg

My current position here compared to the one in Tilburg is similar. There were six deans in my old university; here there are only five. The school (an equivalent term for a faculty at Tilburg University, red.) was a little bit smaller in staff but bigger in terms of student numbers. The topics were different as well. It's much more technical here, in Tilburg it was much more society oriented, although with a firm connection to data science and AI, the technical part came in, therefore it's relatively comparable. However I think the organisations do differ. The way things are organised with procedures, cooperation procedures, and the processes were different. And that requires some adaptation from my side, or from the side of the procedures, we'll see.

The work that I do here, however, does not differ that much to what I did in Tilburg. When I went to Tilburg, I thought it would be really challenging to deal with the philosophers in the philosophy department or with the scientists in the culture studies department, but that turned out to be not so challenging at all. Of course you have challenges, but what are these people doing? They are doing great scientific stuff and they want to teach, but their real concern is, how do we get enough students? Where is the funding for the research? How do



we connect to the outside world? Can we have partners in the outside world?, and so on. And that is similar here for computer scientists or for electrical engineers or biomedical engineers regardless.

So the problems are similar within the faculty, though there is a difference in how problems are approached. There is a difference, very, very broadly speaking, between social scientists and engineers. At this university we have more of the engineering mentality, which is intrinsically more constructive. Most of the people here want to build something when they have a problem. They see a problem, it can be technical or in the outside world, and then they start thinking about a solution. Social scientists have a different approach, and this was reflected in the motto of Tilburg University: "Understanding Society". The goal is to analyse what is going on and try to understand it and to explain it. There is not so much emphasis on the constructive part of solving a problem.

What I like a lot here in Enschede is the campus and this constructive or entrepreneurial spirit. It's also something that you see a lot. There is this building across the street where all the student teams are. If you walk in there, there is so much energy and so much ambition and that is just great, it really makes me happy.

#### Accomplishes in Tilburg

In Tilburg, we managed to build connections between the very different departments. There were six departments



in the school on really, very different topics such as, philosophy, culture studies, AI and data science and communication and information studies. We established connections by providing seed grants for research cooperations across boundaries.

I'm also very proud of the student number increase. We went from 2000 to 3000 students in a couple of years. That is, of course, not just my contribution, but it happened and we accommodated it, we did grow a lot.

As part of the strategy of the university, I also worked on two large projects, one was called ENGAGE. It's a European university alliance similar to ECIU. We made a European wide virtual campus between nine universities across Europe, with European funding, so that students of these universities all have the opportunity to have a European experience, be it by visiting another university or by doing an international class or course, together with students from the other universities, so-called virtual mobility. The other project was that I established a new strategic programme called Digital Sciences for Society in which scientists from across the universities could collaborate on "digital topics," such as data science or AI, in connection with their topic of origin, for instance, law or behavioural sciences. I think that this programme really gave a boost to digitalisation and use of AI within the university as a whole.

#### Advice to Students

If I could go back to my own university days I think I would be a more active student now. I was an okay student, very active in my student dorm, and was very active in sports, but I was less involved in organisational stuff related to the study and study association. For example, I was never a member of the Faculty Council, which I was later as a staff member. If I could go back I would be more active in that part as well.

My advice to the students is to grasp the opportunities.

### Collaboration

This interview was a shared effort between association magazine committees *Ideaal* of Abacus and *I/O Vivat* of Inter-Actief.



//Column

## From the Education Committee

### The Importance of Teaching Assistants

By: Rick de Vries & Pepijn Meijer  
Educational Committee



**Last October, the Education Committee organized the week of education. The Week of Education is a yearly event hosted by the Education Committee to highlight the educational part Of Inter-Actief. This year we organized three activities:**

Cafe IT is an activity that we host multiple times a year. It is always a drink, and around 18:00, alumni come to give a short talk about their experiences and how they use their studies during their current occupation. This year, Marlène Verburg and Teun Metz gave a lovely speech about their experience working at OrangeSpot.

Similar to last year, we also organized a pizza workshop for the week of education. During the pizza workshop, a lot of students attended to create their pizza from scratch and bake it in our pizza oven together with teachers. We also brought a lot of board games for everyone to play together.

Unique to this year, we organized the Education Bounce activity, for which we got two huge bouncy castles and all had fun jumping around in nice sunny weather. This event concluded this year's Week of Education as a big success.

Besides fun activities, there must also be some studying, and the Education Committee knows that. That is why we organize study evenings several times every module. These evenings provide a nice working environment, ideal for getting things done. Whether studying for the never-ending exams or working on one of your projects, our study evenings have got you covered.

They are usually held in SmartXP or Westzaal in the Zilverling building. These evenings are more than just productive - they are also enjoyable. With free snacks and drinks to keep you energized, you can focus on your work while taking the occasional break to relax with your fellow students. You can also order food via Inter-Actief so that you don't have to make dinner yourself while you want to prepare for an exam.

In the past, teaching assistants were present to answer your questions, but unfortunately, due to the university's ongoing financial challenges, this support is no longer available. Despite this change, these evenings remain valuable for students; older-year students who are present are often willing to help as well.

This brings us to a pressing issue: the impact of the university's financial situation on our education. From the lack of teaching assistants to other consequences, this topic is worth exploring further in this article.

Because of the financial situation at the university, quite a bit of student jobs have been vanishing or will employ fewer and fewer students, one of which is the teaching assistants (TAs).

Due to the budget cuts, fewer teaching assistants were employed, which was especially noticeable in Module 1. Here the amount of TAs hired compared to last year was reduced by 20%, however, of the TAs hired 50% worked more hours than they were contracted for. While they did get overtime compensation, the sudden increase in workload caused TAs to struggle with following their study program. With all this the

university wants our program to reduce our TAs to half of our original TAs, which will have an even worse effect on those hired.

Our situation is still comparatively better than other faculties because some studies do not have any TAs anymore and use teachers or PhD students instead. This is less than ideal because their skill sets could be used better, for example by preparing lectures and exams. This will only lower the quality of education and increase the workload of the teachers.

Cutting the budget on student jobs and teaching assistants has certainly affected both students and teachers, creating challenges in maintaining the quality of education and balancing workloads. While these issues require us to adapt and come up with solutions, there is some relief in knowing that the university does not plan further budget cuts on education. By working together and giving feedback, we can do our best to mitigate the effects of these challenges and continue to uphold the quality of education.

### Education Committee

The Education Committee is a committee consisting of nine members that help the Officer of Educational Affairs in forming a bridge between members of Inter-Actief and the studies Technical Computer Science and Business Information Technology.

The Education Committee is involved in handling education-related complaints, manages Inter-Actief's Wiki with previous (test) exams and summaries and organizes several education-related activities.



# Post-Graduation Hole



By: Jelle Maas  
Editor I/O Vivat

**YES! You've done it—you finished your Bachelor's or Master's at the University (of Twente). The whole wide world is now open for you to conquer. But after spending so many hours in study halls, drinking rooms, and the sports canteen, you may have forgotten what it's like to work in the real world. This article is mostly a personal anecdote, sharing my experiences after graduation from my point of view. You might not agree with everything mentioned, but that's okay—you don't always have to agree with everyone and everything.**

Are you close to graduating? Have you already thought about what you'll do after receiving your degree? It might even say cum laude or summa cum laude. Most people have a good plan, but if you didn't secure a job offer during your thesis, a few common scenarios often occur.

## Holiday

Ah, the post-graduation holiday—a well-deserved break after years of deadlines, exams, and academic pressure. This was my first step as well. Whether it's backpacking through Southeast Asia, a European road trip with your closest friends, or simply relaxing on the couch with Netflix marathons, this time is all about recharging and reflecting.

But beware! For some, the holiday turns into more than just a temporary escape.

It can stretch into a long period of indecision as you start to enjoy the freedom a bit too much. You might find yourself wondering, "Do I really need to start working now, or can I prolong this a little longer?"

## Job Market

The reality of the job market often feels like a cold shower. After years of working, stressing, and honing your expertise, you discover that the world is filled with others just as qualified—or even more so. Suddenly, job postings demanding "3-5 years of experience" for entry-level positions flood your feed. And you ask yourself, "Where was I supposed to get that experience while studying full-time?"

Navigating the job market requires patience and resilience. It's important to research your field thoroughly: What are the current trends? Which skills are in high demand? This stage is about marketing yourself. Your diploma is a good starting point, but proving your worth beyond that piece of paper is essential.

First, look at vacancies that genuinely interest you—jobs that seem like something you'd enjoy in the long term. If you don't enjoy your work, it will become a burden, and you might find yourself unhappy in your role.

During your search on the job market, please also have time to work on side projects that you left on the shelf due to your thesis. These projects can help you to stay sharp and might even help you



later in the process. Maybe you thought of creating an application and want to use a new programming language just to have something to do besides the endless scrolls online. So my personal tip here is have some fun while digging through the thousands of vacancies because otherwise you will be doomscrolling the internet.

## Job Application

If the job market is an ocean, the job application process is learning to swim in rough waters. Tailoring your CV, crafting personalized cover letters, and keeping up with online applications can feel like a job in itself. You'll quickly discover that not every company responds to applications, and rejection emails might pile up.

However, every application is a learning opportunity. As you refine your approach, you'll learn how to highlight what makes you unique. Leverage skills you've built during your studies—project management, teamwork, or niche technical abilities you may have overlooked.

Don't underestimate the power of networking; sometimes, it's not what you know but who you know that lands you the interview. For me, it was both amusing and overwhelming to see recruiters flood my inbox after I added #OpenToWork on LinkedIn, it felt like fishes going to find bait in the big ocean which is called the job market. However, many job offers were in Amsterdam or other big cities, with salaries that would not cover rent in these big cities.

A tip that worked for me: create a clear, detailed spreadsheet to track job applications. Include the job title, description, proposed salary, hours per week, location, and the vacancy URL. This helped me stay organized and see how long companies took to respond (which was sometimes shockingly long).

You might also find that some jobs require 2-3 years of experience. Don't hesitate to apply anyway—you have nothing to lose, though you may receive more rejection emails. And don't let the rejections like "We had too many applicants and proceeded with a select group" or "We see you have relevant experience, but..." discourage you. Even-

tually, you'll get that positive response and move on to the next phase.

## Interviews

You've reached the interview stage! This is where the real test begins. Whether it's a casual coffee chat or a formal panel interview, this is your moment to shine.

Interviews can be nerve-wracking. What if you blank on a question? What if you oversell or undersell yourself? Preparation is key. Research the company, practice common questions, and have stories ready that demonstrate your skills and achievements. Remember, interviews are as much about you evaluating the company as them evaluating you.

At the time of writing, I'm in the interview stage myself. Normally, I find conversations easy and enjoy talking, but interviews are a different kind of conversation. For example, during one interview, I was surprised to hear, "We almost didn't invite you because your photo looked too formal." It seems that having a formal CV photo isn't always the best approach!

Be prepared for common questions like: "Why should we choose you over other candidates?"; "What are your strengths and weaknesses?"; and "Why do you want to work here?" Preparation is key and can help you a lot when you easily get stressed of interviews.

## Working Part of Society

Finally, you've landed your first job. Welcome to the 9-to-5 grind—or perhaps something more flexible, if you're lucky. Transitioning from student life to working life can be a culture shock. Suddenly, your days revolve around meetings, deadlines, and office politics.

But being part of the workforce is also incredibly rewarding. You'll meet new people, learn new skills, and see the tangible impact of your work. This new chapter has its own challenges and rewards. Independence and financial stability are liberating, but don't forget to take care of yourself. Burnout is real, so maintaining a healthy work-life balance is crucial.

Personally, I hope to appreciate the job

I land and enjoy the work I do. After all, enjoying your job is the most important, besides having some money to pay off your student debts.

## References

[1] [https://en.wikipedia.org/wiki/Historical\\_nuclear\\_weapons\\_stockpiles\\_and\\_nuclear\\_tests\\_by\\_country](https://en.wikipedia.org/wiki/Historical_nuclear_weapons_stockpiles_and_nuclear_tests_by_country)

[2] <https://nuclearsecrecy.com/nukemap/>