

Ethics in Computer Science Research

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In joyful consultation with Hugo Jonker (Open University, formerly TU/e and Luxemburg)

Bien étonnés de se trouver ensemble for SMLXV - 10 April 2026 - Université de Luxembourg

Ethics in Computer Science Research

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Abstract. This position paper argues that professional responsibility and ethical reflection are relevant to *everyone* educated and working in the computational sciences: not only in areas with direct applications in the center of societal developments (such as cybersecurity and artificial intelligence), but also in more theoretical parts of the field. While work has been done to translate (parts of) ethical issues into formalized requirements, implementation guidelines, and performance measures for moral values (such as trust, privacy, fairness), the engagement with ethics and moral responsibility of the field is yet to be adopted more systematically. We aim to clarify the need for the incorporation of ethical reflection across the computational sciences and to address the role of education in getting there.

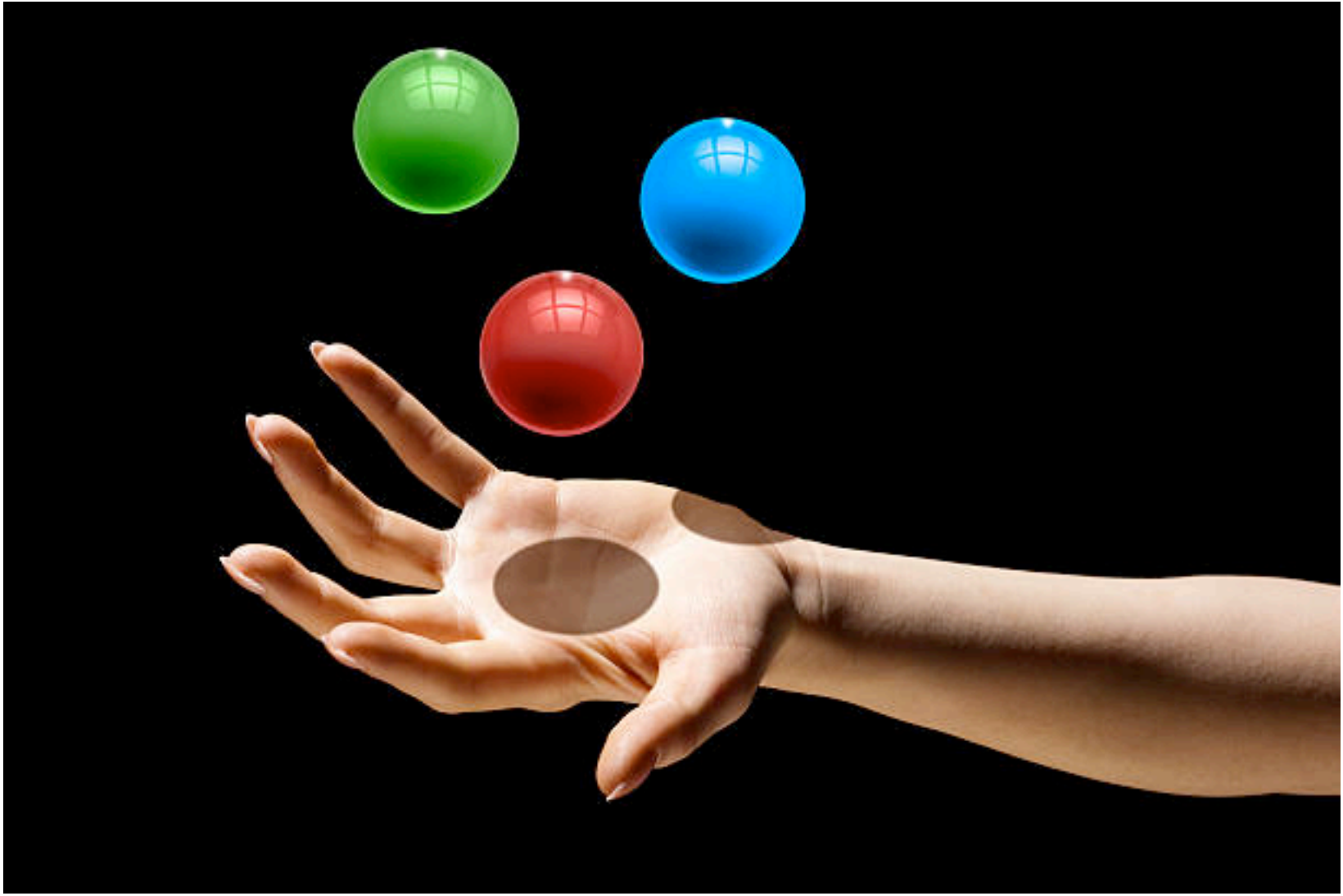
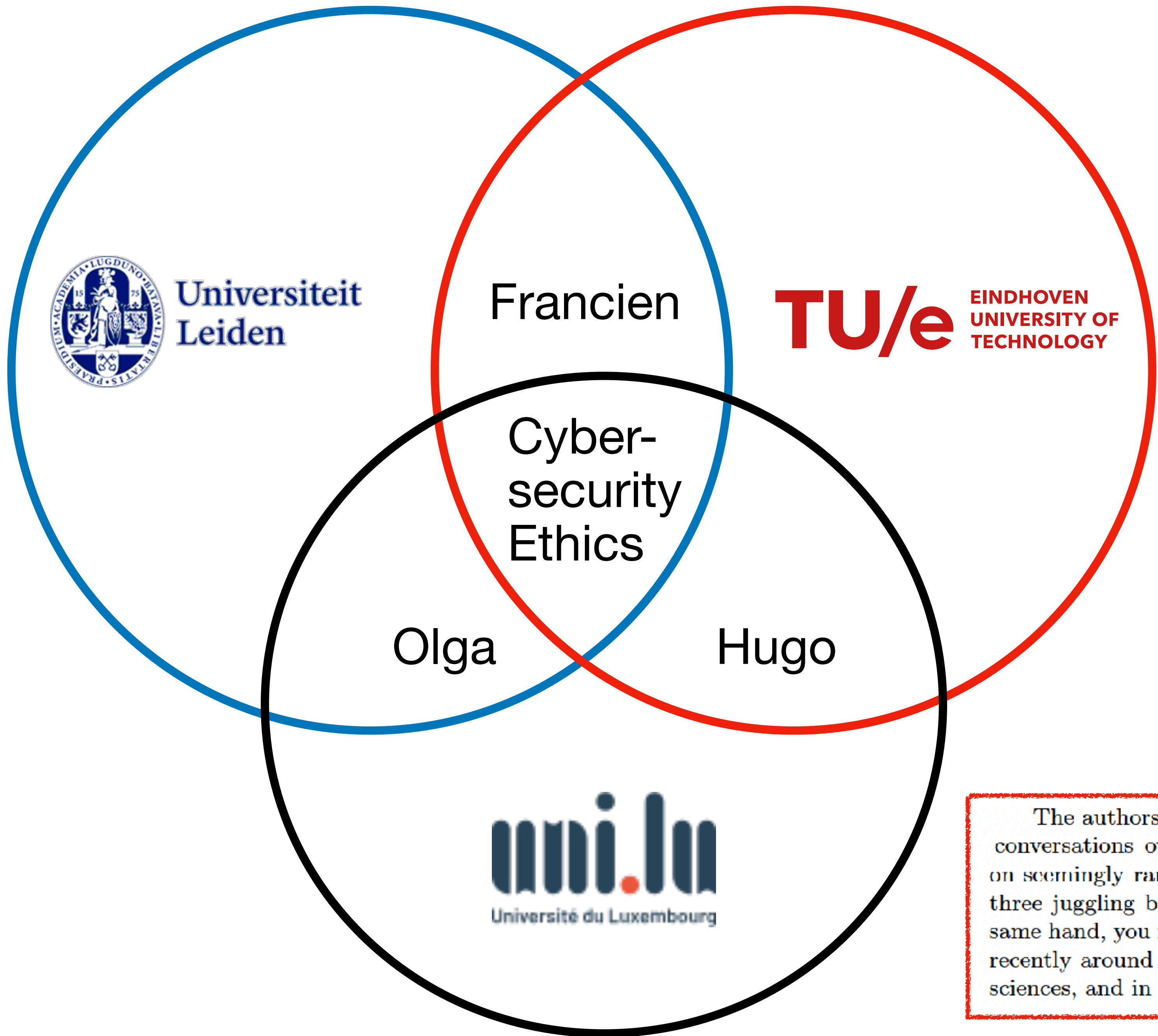
Keywords: ethics · professional responsibility · cybersecurity · artificial intelligence · theoretical computer science · software engineering.

4 Concluding Remarks

In this position paper we have argued that professional responsibility and ethical reflection are relevant to *everyone* educated and working in the computational sciences: not only in areas with direct applications in the center of societal developments (cybersecurity and artificial intelligence, for example), but even – albeit at a more abstract, meta-level – in more theoretical parts of the field.

This engagement with ethics and moral responsibility of the field should go beyond offering computational models and measures for (parts of) ethical issues: it should be systematically incorporated in the professional culture of the field. One step is the installation of an ethics review for the computational sciences, as recommended by the KNAW. Good steps in that direction are currently being made. We argue that, for true culture change and for those review boards to be meaningful, we also need to commit to incorporating the professional responsibilities of the field into our education.

To be clear: this paper does not mean to frame implications of the computational sciences as the sole responsibility of the computational scientist: computational systems are deeply socio-technical, and many stakeholders are involved in their embedding in societal practices and institutions (as expressed in the *problem of many hands* [75]). But we want to signal that with the particular knowledge of the discipline comes particular responsibility – while the discipline does not inherently provide us with the tools, vocabularies, and methods to handle it. Juggling the moral implications of the work – in applied as well as theoretical areas of the field – with the abstract nature of our work requires training and regular practice [24].



The authors and Hugo would like to thank Sjouke Mauw for the many stimulating conversations over the years each of us worked with him, whether on our work or on seemingly random other activities (such as juggling, lindy hop, or unicycles). Like three juggling balls following disjoint trajectories, but thrown up and caught by the same hand, you may appreciate that we have been *bien étonnés de se trouver ensemble* recently around ethics education and ethics review committees for the computational sciences, and in writing this piece.

10
APRIL
2026

16:00

Black Box

Maison des
Sciences Humaines
Campus de Belval



Valedictory lecture

In 2008 I held my inaugural lecture "A window of vulnerability: The virtual world eyeing the physical world" at the University of Luxembourg. Back then I explored an emerging shift: the virtual world was no longer a separate realm, but increasingly turning its gaze toward the physical one. What at the time appeared as a "window of vulnerability", over the past two decades, evolved far beyond its original frame.

Today, the boundary between the virtual and the physical has not merely blurred, but largely dissolved. Digital systems sense, influence, and act upon the physical world at a scale and speed that were difficult to anticipate at the time. This transformation brings many opportunities, but also a new landscape of risks. Questions of security and privacy now extend across both worlds simultaneously, challenging the safeguards on which our society has relied.

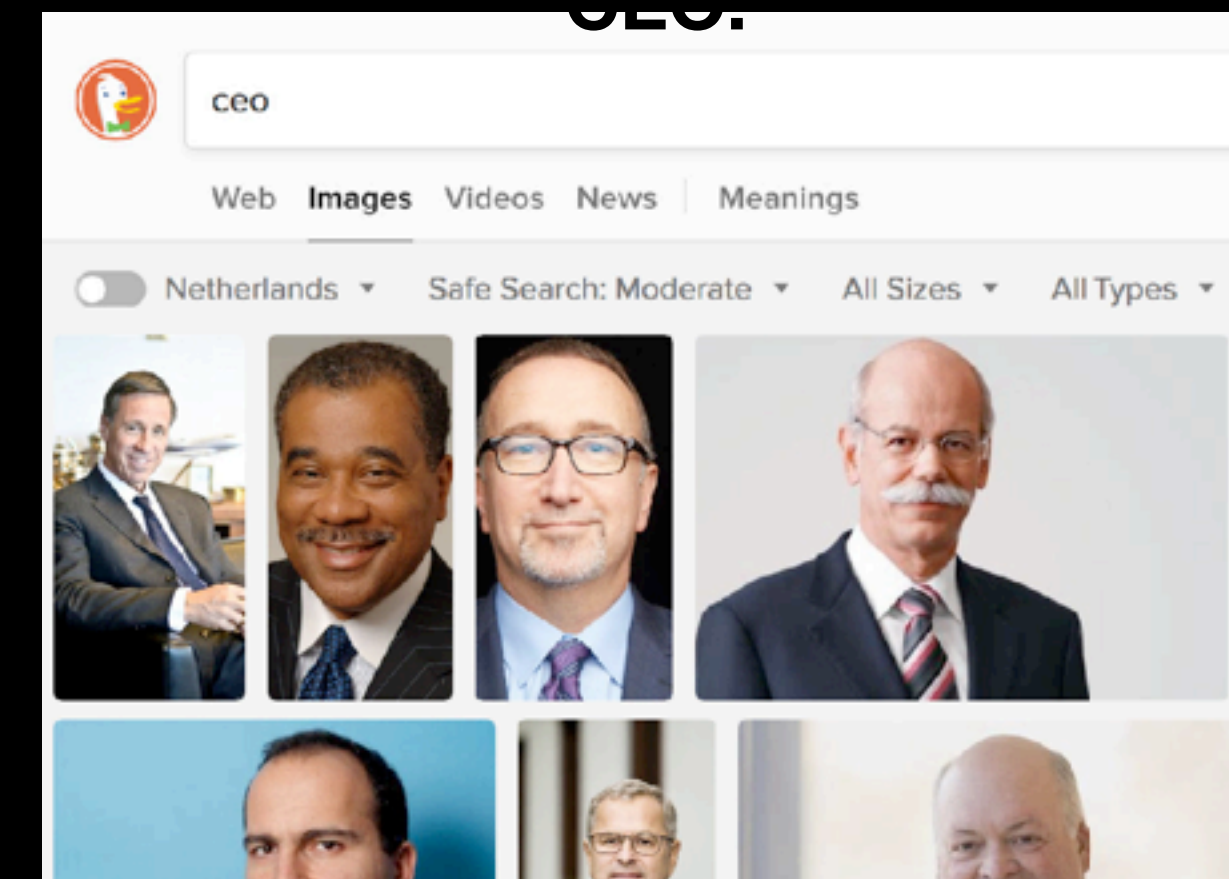
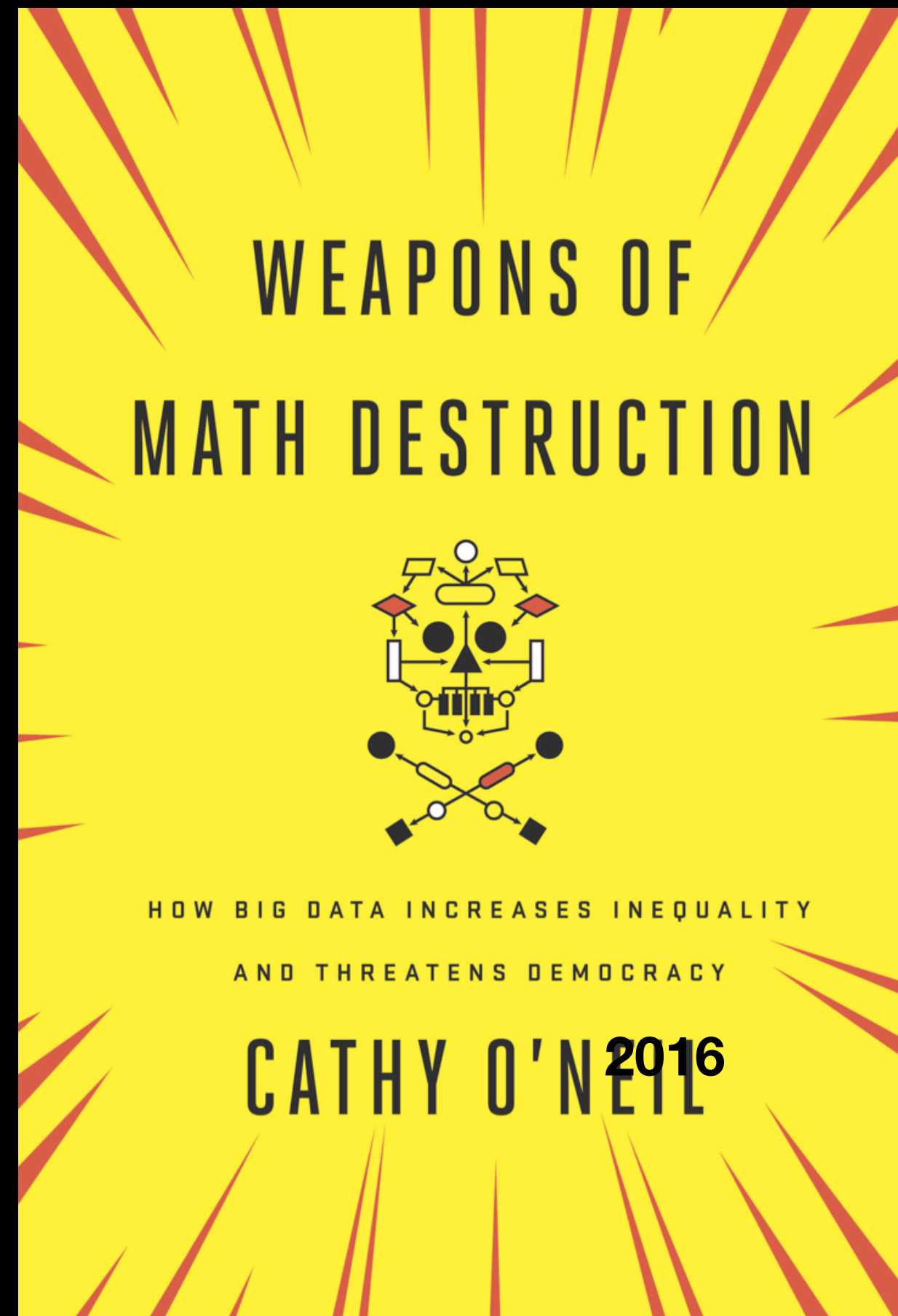
In this valedictory lecture, I will revisit the ideas that shaped my inaugural address, reflect on how reality has unfolded over the last two decades, and explore what lies ahead.

Prof. Sjouke Mauw

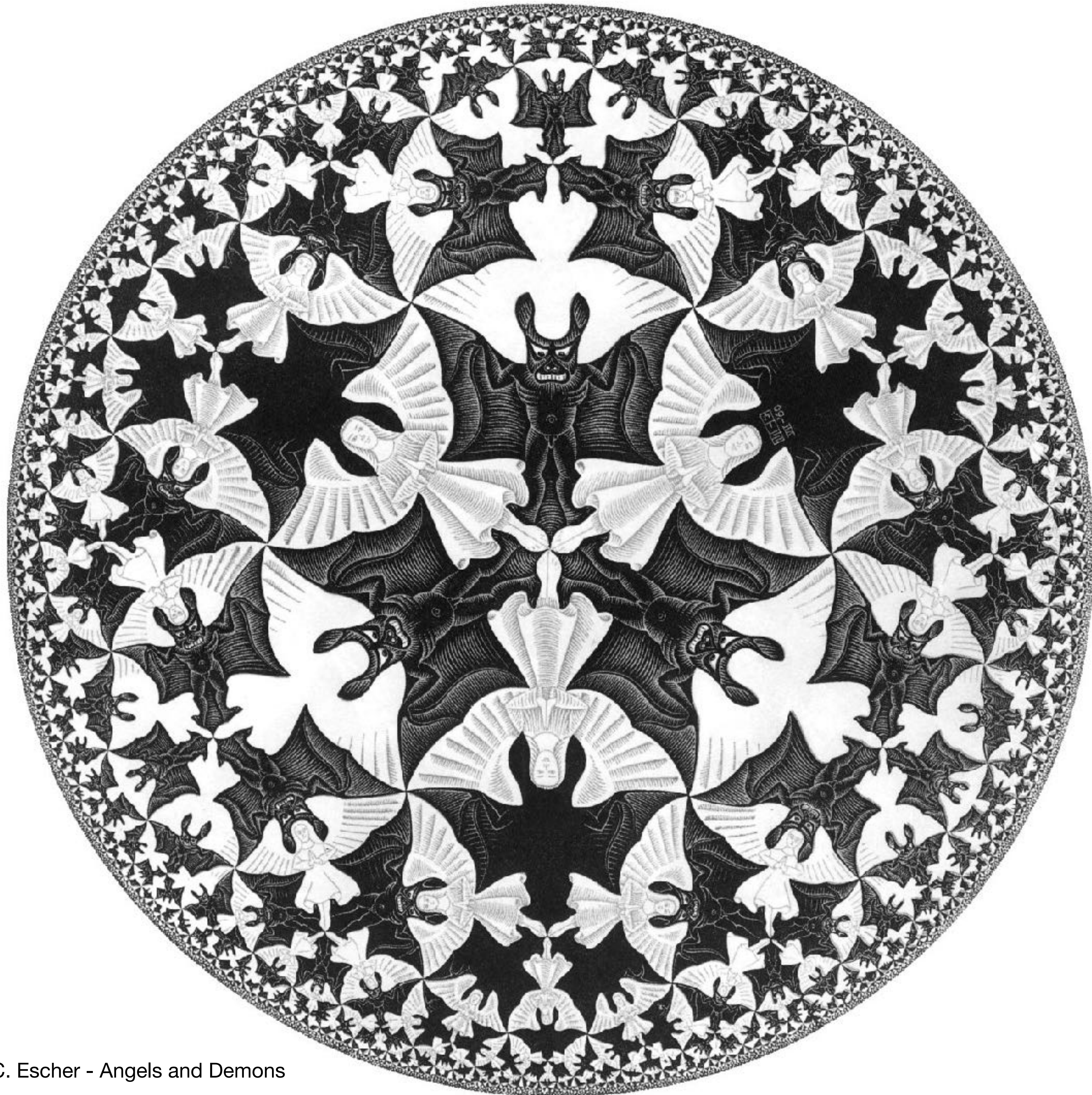
Professor in Security and
Trust of Software Systems
University of Luxembourg



Abstractions are neither good nor bad...
...nor are they neutral! (Kranzberg 1985)



Slave to the algorithm, 1:46-3:20 and 4:38-5:39



M.C. Escher - Angels and Demons

Formal methods and ethics?

- Modeling ethical (non-computational) dilemmas and values (trust, privacy, fairness) with formal methods
- What ethical issues are raised in computational sciences in general?
- Need for reflection on, and education around, specific moral responsibilities for researchers in the computational sciences

Ethics in Computer Science Research

Position paper

- Ethics beyond human subject research: Current role of the computational sciences demands more reflection on the link between analytic work and moral guidance or evaluation (research, role in power structures and awareness of interests, moral agency for the researcher)
- Individual and institutional calls and efforts at the establishment of fields:
 - Establishment of the field of information engineering: ACM (1940s), IEEE (1960s)
 - Cybersecurity: Menlo Report (2012, DHS), inspired by Belmont Report (biomedical and human subject research, 1970s)
 - AI: Norbert Wiener (1940s), Joseph Weizenbaum (1970s), IEEE E/AIS (2016)
- Computational technology has become so deeply part of our lives and society (and politics 🙄), that also underlying “purely theoretical” parts of research imply moral responsibilities for the researchers.

BIJLAGE III

VERHANDELING OVER DEN INVLOED DER MACHINES OP HET ZAMENSTEL DER MAATSCHAPPELIJKE EN BURGERLIJKE BETREKKINGEN

door

Prof. Dr. J. R. THORBECKE

(posthuum)

Het zij mij vergund, om voor een der meest dagelijksche onderwerpen van algemeene opmerking en belangstelling Uwe aandacht gedurende eenige oogenblikken te vragen. Schijn ik U bij die meer aan mijne bijzondere betrekking, dan aan het doel van het Genootschaps te hebben toegegeven, zoo verzoek ik U, elk met zijn eigene maat te meten, en mijne spreekbeurt te beschouwen als een verpoozing van de meer fijne en uitgezochte bespiegelingen van smaak en fraaye letteren, waarover andere redenaars U door mij onderhouden. Het onderwerp, dat ik bedoel, is een der zeer belangrijke stukken van Staatshuishoudkunde, eene wetenschap, die meer, dan eenige andere, te midden van het werkelijk maatschappelijk leven toeft. Hetgeen ik U meen voor te stellen, is een der merkwaardigste verschijnselen van den nieuweren tijd, welke berekenbare kracht het vermogen van den mensch, om de sferen der natuur tot goederen te vormen, duizendvoudig verhoogd heeft uitgezet heeft. Overal, waar de kunsten der nijverheid bloeien,

door een regelmatig gebruik zijner vermogens, te verschaffen.

De vraag is niet, M.M.H.H., of wij de merkwaardige omwenteling, welke de nijvere wereld door de toepassing der machines ondergaan heeft, goed- dan afkeuren, of wij ze zullen aannemen, dan verwerpen. De omwenteling is gebeurd; hare gevolgen werken voort, en zijn op lang na nog niet tot rijpheid gekomen. Zoo groote gebeurtenissen behoeven een verloop van eeuwen, om al hare uitwerkingen in strijd en in gemeenschap met het geheele samenstel der menschelijke zaken, te ontvouwen. Dan is het van het hoogste belang, ons met den stroom van zulk eene gebeurtenis niet blindelings en werkeloos te laten afdrijven; maar haar met kennis en inzicht van den beginne af toe te lichten, en waakzaam gestadig op zijde te blijven. Dit geeft ons de bevoegdheid om te handelen, wanneer het noodig en tijd is; dit verleent ons de magt om te regelen, waar wij anders minder dan werktuig zouden zijn; en hieruit spruit eindelijk het beleid voort, om de krachten, welke de huishouding der volken bewegen of beroeren, naar die streek te wenden, dat zij, in stede van ons mede te slepen, met de gezamenlijke vorderingen van een welgeordend, naar innerlijke overeenstemming strevend, maatschappelijk bestaan gelijken koers houden.





The Moral Character of Cryptographic Work*

Phillip Rogaway

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December 2015
(minor revisions March 2016)

Abstract. Cryptography rearranges power: it configures who can do what, from what. This makes cryptography an inherently *political* tool, and it confers on the field an intrinsically *moral* dimension. The Snowden revelations motivate a reassessment of the political and moral positioning of cryptography. They lead one to ask if our inability to effectively address mass surveillance constitutes a failure of our field. I believe that it does. I call for a community-wide effort to develop more effective means to resist mass surveillance. I plead for a reinvention of our disciplinary culture to attend not only to puzzles and math, but, also, to the societal implications of our work.

Keywords: cryptography · ethics · mass surveillance · privacy · Snowden · social responsibility



Preamble. Most academic cryptographers seem to think that our field is a fun, deep, and politically neutral game—a set of puzzles involving communicating parties and notional adversaries. This vision of who we are animates a field whose work is intellectually impressive and rapidly produced, but also quite inbred and divorced from real-world concerns. Is this what cryptography *should* be like? Is it how we *should* expend the bulk of our intellectual capital?

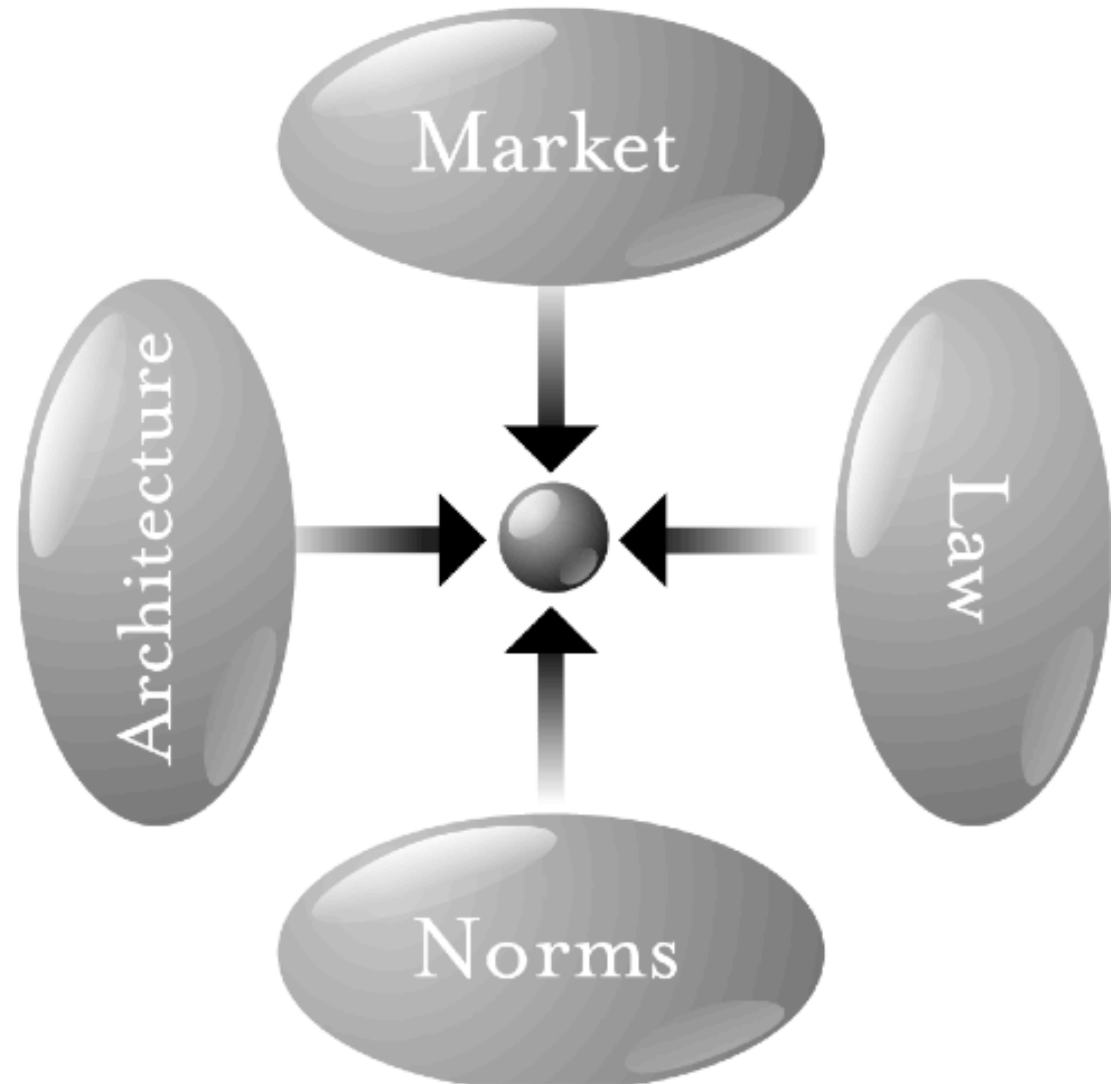
For me, these questions came to a head with the Snowden disclosures of 2013. If cryptography’s most basic aim is to enable secure communications, how could it *not* be a colossal failure of our field when ordinary people lack even a modicum of communication privacy when interacting electronically? Yet I soon realized that most cryptographers didn’t see it this way. Most seemed to feel that the disclosures didn’t even implicate us cryptographers.

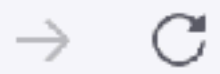
I think that they do. So I want to talk about the moral obligations of cryptographers, and my community as a whole. This is not a topic cryptographers routinely discuss. In this post-Snowden era, I think it needs to be.

* This is an essay written to accompany an invited talk (the 2015 IACR Distinguished Lecture) given at Asiacrypt 2015 on December 2, 2015, in Auckland, New Zealand. The essay and talk are addressed to the cryptographic community—my community—and the words “we” and “our” should be so interpreted. I apologize in advance if I offend anyone with any of my comments; nothing of the sort is my intent.

The computer science professional (incl. research) has particular knowledge and awareness, and thereby particular agency, and thereby responsibilities towards the role of the computational in people's lives and in the organisation of society.

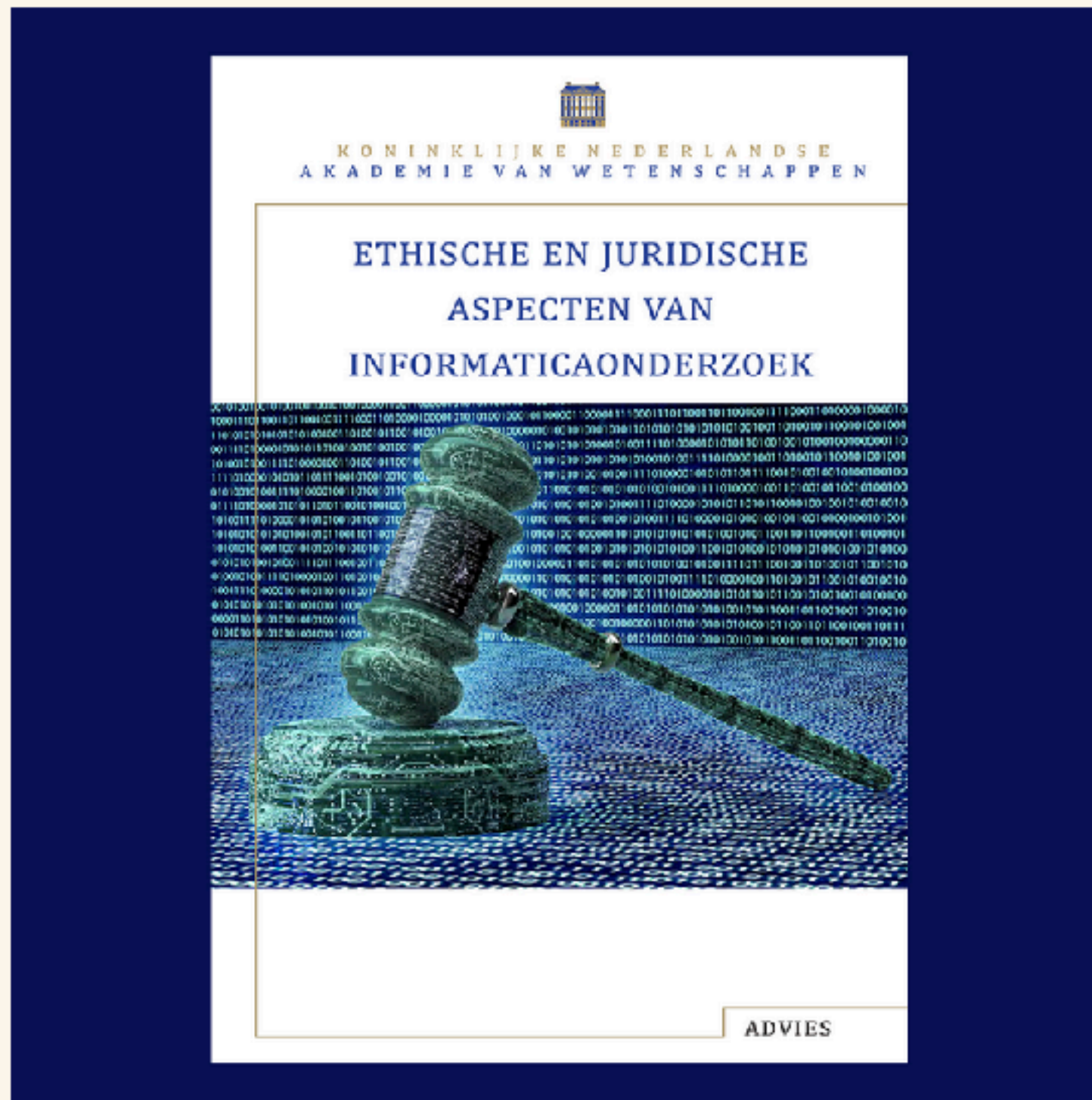
Researchers have a professional responsibility to contribute to understanding these impacts, and to engage with deliberations about them.





Voor dit advies heeft het bestuur van de KNAW de Commissie Ethische, Juridische en Veiligheidsaspecten van big data en Informaticaonderzoek ingesteld. Deze commissie bestond uit de volgende personen:

- Prof. dr. Jan Willem Klop (voorzitter), Vrije Universiteit Amsterdam en Centrum Wiskunde & Informatica
 - Prof. dr. Jan Bergstra, Universiteit van Amsterdam
 - Prof. dr. Frank van Harmelen, Vrije Universiteit Amsterdam
 - Prof. dr. Jeroen van den Hoven, Technische Universiteit Delft
 - Prof. dr. Bart Jacobs, Radboud Universiteit Nijmegen
 - Prof. mr. Corien Prins, Universiteit van Tilburg
 - Drs. Melle de Vries, KNAW
- Ir. Arie Korbijn (senior beleidsmedewerker KNAW) was secretaris van de commissie.



2016 • 96 pagina's

Ethische en juridische aspecten van informaticaonderzoek

Natuur- en Technische Wetenschappen

De KNAW adviseert om beoordelingscommissies in te stellen voor ethische en juridische dilemma's in informaticaonderzoek. De KNAW pleit ervoor dat dergelijke beoordelingscommissies in gezamenlijkheid eenduidige kaders ontwikkelen.

De KNAW adviseert om voor informaticaonderzoek ethische beoordelingscommissies in te stellen, met gebruik van ervaring uit de medische disciplines. Als deze commissies samenwerken, van elkaar leren en elkaars kennis delen, ontstaat een gezamenlijk, transparant en herkenbaar beoordelingskader.

Ondanks een ethische beoordelingscommissie zijn volgens het advies individuele wetenschappers altijd zelf verantwoordelijk voor de omgang met mogelijk ethische en juridische dilemma's in hun onderzoek. Het adviesrapport doet een aantal aanbevelingen om onderzoekers daar zich meer bewust van te maken, zoals het opstellen van een gedragscode, de aanstelling van een ethisch adviseur en ethiek en integriteit tot een verplicht onderdeel te maken van de opleiding tot onderzoeker.

De KNAW verwacht dat het opstellen van ethische beoordelingskaders ook voor andere disciplines een inspiratiebron is.

Download het adviesrapport

 [Ethische en juridische aspecten van informaticaonderzoek](#)

 [English summary](#)

Ethics Working Group

The aim of the IPN Ethics Working Group is to provide a platform to share information and knowledge about the various Ethics Committees that already exist or are being formed within the various Informatics departments in the Netherlands. A special initiative is the IPN working group on Ethics in Computer Science.

In recent decades, the global research community has become increasingly aware of the responsibility that researchers bear in conducting research on humans. This ethical awareness encompasses a variety of disciplines, including Computer Science. Computer ethics is a branch of practical philosophy that deals with how computing professionals should make decisions regarding professional and social conduct. It encompasses the procedures, values, and practices that govern the use of computing technology without violating moral values and beliefs. Computer ethics primarily focuses on the ethical use of computing resources, including methods to avoid infringing copyrights, trademarks, and unauthorized distribution of digital content. It also addresses issues related to internet privacy, publication of copyrighted content, and user interaction with websites, software, and related services.

Contact



TRAI RAPPORT

Verantwoorde AI in AI-opleidingen in Nederland: Uitdagingen en kansen

Over de auteurs

In 2022 is de werkgroep "Teaching Responsible AI" (TRAI) geïnitieerd door de volgende personen:

- Francien Dechesne (Universiteit Leiden)
- Maaike Harbers (Hogeschool Rotterdam)
- Marieke Peeters (Hogeschool Utrecht / Mooncake AI)
- Birna van Riemsdijk, voorzitter (Universiteit Twente)
- Pascal Wiggers (Hogeschool van Amsterdam)

TRAI is ontstaan binnen de werkgroep Participative and Constructive Ethics (PACE) van de Human Centric AI-bouwsteen¹ van de AIC4NL² (destijds nog bekend als NLAIC). Het thema met betrekking tot onderwijs valt onder het werkgebied Talent, Kennis en Vaardigheden³, en met het toepassingsgebied Onderwijs⁴. Eerder kwam uit de PACE werkgroep onder meer het rapport "Ethiek en AI – zeven methoden in theorie en praktijk" (PACE, 2022) uit.

TRAI beoogt het volgende:

- Het delen van kennis en inzichten over het integreren van Verantwoorde AI (VAI)-methoden, -technieken, en -kennis in technische AI-opleidingen in Nederland.
- Het opbouwen van een community die onderwijsinstellingen ondersteunt bij het onderwijzen van VAI, door toegang te bieden tot kennis en middelen en zo de instap te vergemakkelijken.
- Het agenderen van VAI binnen onderwijs en bedrijfsleven, door praktijkervaringen en behoeften uit het werkveld terug te koppelen naar het onderwijs, en actuele wetenschappelijke inzichten te delen met organisaties.

¹ <https://aic4nl.nl/community/werkgebieden/>

² <https://aic4nl.nl>

³ <https://aic4nl.nl/onze-ondersteuning/verantwoord-omgaan-met-ai/>

⁴ <https://nlaic.com/toepassingsgebied/onderwijs/>

Ethics as a deliberative, collective, interpersonal, interdisciplinary activity: Creating platforms for exchange



16:15 - 17:00 Panel: **Ethics in Computing: How can we design algorithms that are more fair, transparent and explainable?**
Speakers: [Francien Dechesne](#) (Leiden University), Christine Utz (Radboud University), Hugo Jonker (Open University)



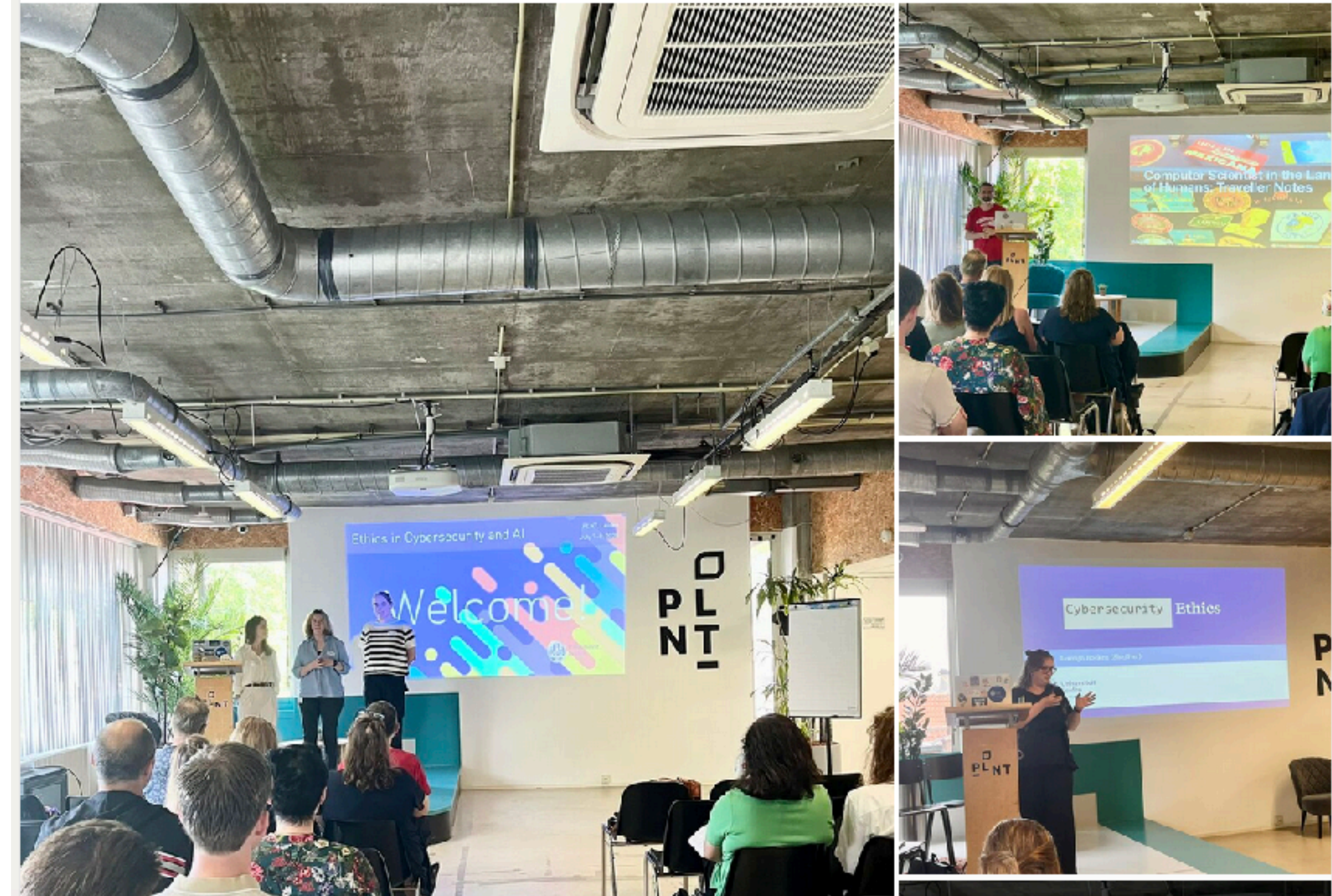
Olga Gadyatskaya · 1st

Associate Professor of Cyber Security at LIACS, Leiden University

8mo · 🌐

This week has started by a super-interesting event on Ethics in Cybersecurity and AI that we co-organized with [Cristina Del Real](#), [Francien Dechesne](#) and [Shuang Sun](#). Two days packed with moral dilemmas, difficult choices for study programs and university courses, and cross-disciplinary insights on what ethical thinking brings to our research. Thank you to all the speakers and to [Leiden University](#) for making this happen! And hopefully more events like this will come.

[Alexander Serebrenik](#) [Luca Consoli](#) [Jeroen van der Ham-de Vos](#) [Ella Akin](#) [Julian van der Kraats](#) [Jasmijn Boeken](#) [Dennis Reidsma](#) [Doina Bucur](#) [Philip Nickel](#) [Sifra M. Marco](#) [Romagna Els De Busser](#) [Lena Riecke](#) [Tess E. Marleen Weulen](#) [Kranenbarg Thijs van Ede](#) [Kate Labunets](#)



Ethics in Computer Science Research

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On Formal Methods in Academia

