Conference Ethics by Design:
responsible development of technology in the ESG ecosystem

Book of Abstracts

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SPIS TREŚCI

Responsible design, implementation and use of smart technologies lies at the heart of the European approach to digital innovation. It is aptly illustrated by the EC Ethics Guidelines for Trustworthy AI as well as the Regulatory framework proposal on artificial intelligence (AI Act). Nonetheless the values, principles and requirements included in these documents are only the first step to operationalize technology's governance. For ethical and legal requirements to be effectively put to work, further practical steps are necessary.

Ethics by Design (EbD) is a complex approach that allows systemic translation of high-level principles and requirements into concrete actions aligned with every module of the design process. As such, it is an indispensable component of both tech ethicists' and tech designers' toolboxes.

However, the term itself can also be used as a synecdoche and describe more generally technology ethics in its applied form. This broader understanding is the one we refer to in the conference title indicating that technology ethics to be operationable needs to be perceived in its applied context, i.e. as Ethics by Design.

The need to responsibly navigate technology's development and use in the ever more complex governance landscape can be a serious challenge for organisations but also a chance to become more innovative and have higher valuation while meeting rigorous ethical standards. To this aim however, tech ethics must not be perceived in isolation.

One of the most promising ways to foster the broader adoption of Ethics by Design is framing it in the context of sustainable investing and ESG (Environmental, Social, Governance) reporting. Both trends are becoming increasingly popular and the technological factor is to play an ever more important role in the ESG mix. This will only become more apparent once the EU AI regulation comes into force.

ESG as a concept dates back to the beginning of the 21st century. Since then, it has given rise to a number of interconnected terms such as the circular economy, Corporate Social Responsibility (CSR) or Regenerative Value Creation (RVC). Nonetheless, regardless of the used nomenclature and the differences between the various concepts – ESG is the idea that companies should not only be concerned about economic interest, but also consider their impact on the environment, local communities and ethical issues.

This call for papers is directed to established researchers connected with research and development fields, ethics, bioethics, philosophy, economics and Horizon Europe programme. We also invite students and junior researchers that just start their work within selected fields and wish to present their findings and ideas. The Organizing Committee has selected a few topics that might be viewed by participants as interesting or stimulating to drafting their own presentation.

TOPIC AREAS OF CONFERENCE

ENVIRONMENTAL
- CleanTech – ethical approach to create sustainable water and energy solutions,
- The ethics of green and digital twin transitions.

SOCIAL
- Addressing the importance of "S" component in ESG,
- Design and implementation of ethics in solutions based on AI – "ethics by design" approach across various industries e.g. medical, financial, insurance, HR. Human centric design in relation to sustainability.

GOVERNANCE
- Ethics management and leadership in times of uncertainty – considering "ethics by design" approach in areas such as supply chain management, governance structure and engagement or policies design,
- ESG analyses as tools for ethics-based AI auditing,
- The contribution of AI in the ESG.

Together with the conference partners, we would like to emphasise that we are open to cooperation with national and international scientists and organisations also in our research projects.

Acting in accordance with the Responsible Research and Innovation (RRI) concept, we wish to participate in the transformation of the European research and innovation system, targeted at the grand challenges of our time (science for society) where deliberation and reflection are followed by action (science with society). Łukasiewicz – ITECH, as an analytical unit of Łukasiewicz Research Network, specialises in socio-economic research conducted in the field of STI (Science, Technology, Innovation). We are open to cooperation in a broad context with researchers and organisations sharing similar principles.

THE CONCEPT OF TECHNOLOGICAL NEUTRALITY IN LAW

PROF. KAROL DOBRZENIECKI, ŁUKASIEWICZ RESEARCH NETWORK — ITECH INSTITUTE OF INNOVATION AND TECHNOLOGY

This conference presentation delves into the intricate and evolving concept of technological neutrality within the legal framework, aiming to dissect its implications and explore the nuanced juridical dimensions it encompasses. As technological advancements continue to reshape the legal landscape, understanding the application and implications of technological neutrality becomes paramount.

The study embarks on a comprehensive analysis of the historical development and contemporary manifestations of technological neutrality in legal contexts. By examining case studies, legislative frameworks, and judicial decisions, we aim to elucidate how the principle of technological neutrality operates across diverse legal domains, from intellectual property and privacy to telecommunications and beyond.

Furthermore, the presentation scrutinizes the challenges and opportunities associated with maintaining technological neutrality in an era of rapid technological evolution. It addresses questions related to regulatory adaptability, the protection of fundamental rights, and the potential impact on legal precedents. Insights derived from this analysis aim to inform legal practitioners, policymakers, and scholars about the evolving dynamics of technological neutrality and its implications for the rule of law.

This presentation ultimately contributes to the ongoing discourse surrounding the role of law in navigating the complex intersection of technology and society. By unraveling the concept of technological neutrality, we aim to provide a deeper understanding of its implications, offering insights that can shape more informed legal responses to the challenges posed by rapid technological innovation.

PROF. PAWEŁ ŁUKÓW, FACULTY OF PHILOSOPHY UNIVERSITY OF WARSAW

Ethics review of research proposals is often perceived as an obstacle to scientific progress or development of technology. The presentation offers a view of the process of project design as promoting awareness of research ethics standards, identification of the project's ethics aspects at the stage of scientific question framing, awareness of specific ethics questions related to the methodology of the project, and adjustment of a project's methods to the ethics standards by a reflexive and reflective modification of the project. This is acheved by placing the project development process in the context of research review, in which the role of research ethcis experts is viewed as that of facilitarttors of interpretation and understanding of research ethics standards, sources of research ethics advice, and providers of continuous feedback regarding the ethics aspects of a particular project. In this way, by setting up responsive systems of research ethics review, the review process can be redefined as enhancing researchers' ethics awareness and perspective.

ASSESSING ETHICAL IMPACTS OF (NOT) SHARING NANOSAFETY DATA

PHD INEKE MALSCH, MALSCH TECHNOVALUATION

In RiskGONE, online tools have been developed to guide users through an ethical impact assessment (EIA), as part of a more encompassing modular risk governance framework. The EIA process is based on the CEN pre-standard on EIA (CEN CWA 17145-2:2017). In this poster, the possible added value of the EIA tools was analysed for addressing ethical impacts in decision making on whether or not, and how to share nanosafety data, based on limited open access information found on the internet, and incorporating responses to comments from ethics and data experts.

NANOMEDICINE: WHAT NEXT

PROF. PIERA DI MARTINO, UNIVERSITÀ "G. D'ANNUNZIO" DI CHIETI E PESCARA DIPARTIMENTO DI FARMACIA VIA DEI VESTINI

Nanotechnology is expected to have rapid and strong future development and it is predicted to significantly contribute to the economic growth and job creation in the EU in the coming decades.

Nowdays, there are many different fields were nanotechnologies are currently applied such as food and textile industry, clean energy, nanofertilizers, optical engineering, and in particular nanodevice and nanomedicine.

According to the researchers, there are four different generations in the nanotechnology advancement, and today we are going through the first two phases. The first one concerns the development of material science with enhancement of properties that are achieved by the incorporating "passive nanostructures". The second generation is referred to "active nanostructures", bioactive to provide a drug at a specific target cell or organ. The third generation refers to "nanosystem for nanorobotics" and the fourth to the molecular nanosystem to control growth of artificial organs. Safely designing nanomaterials involves to consider several aspects such as adverse health, environmental and safety impacts, social and ethical issues, stakeholders and public dialogue, and finally regulatory issues. Specifically concerning the nanomedicine evolution, the first nano-products were developed in 30 years starting from 1964, reaching the clinical triels and marketing from 1995 to 2007. At the present, we are assisting to an expansion and refinement of nanomedicine applications, where novel products are designed to actively and more precisely targeting drugs, with the great goal of reducing their side effects.

WELL-BEING QUANTIFIED: A VIABLE GOAL, UNATTAINABLE IDEAL, OR TECHNOCRATIC MISCONCEPTION?

MACIEJ CHOJNOWSKI, CENTER FOR ETHICS OF TECHNOLOGY AT HUMANITES INSTITUTE

Well-being is one of the central concepts in discourse on sustainable development, trustworthiness of AI, and ESG reporting. Although oftentimes presented as an attractive alternative to the popular measure of GDP, as a concept it is by no means anything new. The most obvious philosophical tradition that it can be traced back to is utilitarianism and Jeremy Bentham's felicific calculus. This algorithmic account is the main source of contemporary attempts to quantify well-being, which can be conceptualized on different levels (e.g. individual, local, national, global) and measured using subjective (e.g. life satisfaction) or objective indicators (e.g. income, health).

Although the idea of well-being measurement made up a huge part of the philosophical, political and economic discussions in the past decades, it was often criticized (especially the utilitarian account) with arguments concerning its methods of measurement (e.g. how should individual number-feeling associations add up and be compared across different people in the experience-sampling approach?) as well as non-objectivity of the science of well-being as a value-laden, normative discipline.

It therefore seems reasonable that today's endorsement of well-being as a credible metric be aware of earlier debates about its viability. It is especially important with regard to the threats of algorithmization, which is a technocratic ideal of governance in the era of AI. In her book „Atlas of AI", Kate Crawford warns against today's AI classificatory infrastructures reducing the world's complexity to simply make it more computable, and questions the quantifying approach itself. It is the approach visible not only in today's algorithmization of reality in the AI domain but also the one that can form the basis of the moral algebra aimed at measuring, comparing, and managing well-being in the world.

These objections are of the same nature as the earlier ones formulated against the simplistic accounts of well-being quantification. The paradox is that in order to reduce the negative impacts of AI, which itself is based on simplification of reality, we refer to ethics of AI, which in turn points at the well-being requirement, which in practice may well lead to simplification of different dimensions of human experience, which is the very result we would like to avoid.

Should we then give up attempts aimed at well-being quantification with regard to AI? No, but this requirement cannot be dealt with mechanically. Well-being measures, approaches and metrics have to be adapted according to a specific context. The demand for ethical competencies here is very high. Thorough understanding of AI ethics will be crucial for sensible operationalization of trustworthy AI requirements (incl. societal and environmental well-being) as only those with a sufficient background will be able to contextualize specific cases.

It is also very important that the actions taken to fulfil the requirements included in the trustworthy AI guidelines and the AI Act be not seen in separation from the standards

being developed in the ESG domain. It is only through this sort of integration these requirements can really become impactful.

Well-being can then be a technocratic misconception when we think that with technology we can capture the essence of human well-being by reducing the whole richness of our experience to a bunch of psychometric and behavioral data gathered on us. On the other hand, it will also remain an unattainable ideal when we believe that well-being can be perfectly observed, measured, and then compared and effectively governed. However, it can be a viable goal if we realize that when quantified well-being is always just a proxy, and we need to be careful when making decision on its basis.

ETHICS AS THE ESG BACKBONE: WHERE ARE ETHICAL ASPECTS LOCATED IN THE ESG LANDSCAPE

DOMINIKA BAGIŃSKA-CHYŁEK, ŁUKASIEWICZ RESEARCH NETWORK — ITECH INSTITUTE OF INNOVATION AND TECHNOLOGY

This conference presentation delves into the intricate relationship between ethics and Environmental, Social, and Governance (ESG), aiming to elucidate the positioning of ethical aspects as the foundational backbone of the ESG framework. As sustainability becomes an increasingly crucial issue of corporate decision-making and stakeholder engagement, understanding the nuanced intersection of ethics within the broader ESG landscape is imperative.

The study employs a comprehensive literature review and empirical analysis to identify and assess the various ethical dimensions embedded within ESG criteria. Through an exploration of corporate practices, regulations, and emerging trends, I aim to highlight the key areas where ethical considerations play a pivotal role in shaping sustainable business practices. This investigation spans diverse industries and geographies, providing a holistic view of the ethical underpinnings that contribute to ESG performance and impact.

Furthermore, the presentation explores the challenges and opportunities associated aligning ethical principles with ESG metrics. ESG incorporated into development strategy means paradigm shift of business models. It addresses the question of whether ethical considerations are adequately represented in current ESG frameworks and suggests potential enhancements for a more robust integration. Insights derived from this analysis aim to inform corporate leaders, investors, and policymakers on how to navigate the evolving landscape of responsible business practices in the context of ESG.

Ultimately, this presentation seeks to contribute to the ongoing discourse surrounding the evolution of ESG standards and their ethical underpinnings, emphasizing the pivotal role that ethics plays in shaping a sustainable and socially responsible global business environment.

CHALLENGES FACED BY THE PRODUCT DESIGNER IN THE CONTEXT OF ESG

ANNA HAMERA, UNIVERSITY OF BIELSKO-BIALA

The presentation titled 'Challenges faced by the Product Designer in the context of ESG' explores the role of the Product Designer in ESG-conscious organizations, the necessary competencies required of them, building awareness among design professionals, and the impact of sustainable design on business.

As organizations increasingly embrace ESG principles (Environmental, Social, and Governance), Product Designers play a crucial role in driving sustainable innovation and responsible practices. They face unique challenges in aligning design processes with ESG goals while maintaining product functionality, aesthetics, and User Experience.

This presentation sheds light on the specific challenges encountered by Product Designers in the context of ESG. It addresses the need for designers to possess a comprehensive understanding of ESG guidelines, including environmental impact assessment, social responsibility, and ethical considerations. Furthermore, it explores the importance of incorporating sustainability into every stage of the design process, from ideation to manufacturing and end-of-life considerations.

An essential aspect of the presentation is focused on building awareness among design professionals regarding ESG principles and sustainable design practices. It emphasizes the need for ongoing education and collaboration with stakeholders to foster a sustainability-driven design culture within organizations.

Additionally, the presentation highlights the business impact of sustainable design. It explores how integrating ESG principles into product design can enhance brand reputation, customer loyalty, and market competitiveness. Moreover, it examines the potential cost savings and resource efficiencies achieved through sustainable design strategies.

By addressing the challenges faced by Product Designers in the ESG context and emphasizing the importance of sustainability in design, this presentation aims to inspire designers to embrace their role as change agents and catalysts for positive environmental and social impact within organizations.

POSSIBLE NECESSITY OF THE USAGE OF AI AS A CONSEQUENCE OF NEW EU REGULATIONS CONCERNING IMPLEMENTATION OF ESG PRINCIPLES IN BUSINESS

WITOLD PODRAZA, UNIVERSITY OF WROCŁAW

Recent enacted provisions of the EU-law, especially those of the so-called CSRD Directive, imposed on companies – by now only on the largest ones – obligations concerning ESG auditing. Utilising of AI tools may be helpful already during the stage of the audit, however, more importantly, the need of disclosing ESG information will encourage companies to optimise and improve their achievements in this area, especially as already now efforts made by companies in the ESG area are believed to have positive influence on the image and the value of companies. AI can be successfully used in logistics and – consequently – to reduce carbon footprint. Also in the matters of HR there is a place for some "automatization" provided by AI, even though humans, and not the algorithms, shall have central position there.

However, EU law, which may practically may the scope of application of AI. According to the European Commission, AI is only a tool, which has to be human-centric. It can be assumed that – in spite of some inclination – AI should not replace humans in decision-making.

In spite of the strong incentive to introduce AI to optimising in companies according to ESG, its usage will have to stay limited by the need of providing humans the space for their "last word" in deciding about the fate of companies policy. Full implementation of ESG principles in a given company without the usage of AI tools may become de facto impossible, and new obligations imposed by EU law may popularise AI.

FINTECH SECTOR AND ESG REGULATIONS - MAIN CHALLENGES AND OPPORTUNITIES

ZUZANNA MACHNIAK, JAGIELLONIAN UNIVERSITY

Main thesis: European and Polish FinTech companies would be obliged to implement selected ESG regulations, such as Corporate Sustainability Reporting Directive, Sustainable Finance Disclosure Regulation, Corporate Sustainability Due Diligence Directive and regulations covering greenwashing issue. On the one hand, implementation of those regulations might be a great challenge due to lack of regulatory clarity and lack of data, but on the other hand it might benefit FinTech companies in particular in business and investor relations.

Numerous ESG regulations are being developed by the European Union, many of them already in force. The scope of ESG regulation covers various types of companies operating in the EU, FinTech companies included.

Given that FinTech companies are often small and medium-sized enterprises that do not meet qualification criteria for ESG regulations, they might be covered by ESG regulation directly or indirectly. Indirect application of ESG regulations refers specifically to investor relations and supply chain management. Namely, if a small FinTech company has established business relationship with a company covered by Corporate Sustainability Due Diligence Directive (CSDDD), that company might require FinTech company to implement environmental or human rights standards. If the company does not apply ESG standards, there is a risk of severing business relationships and further exclusion from tenders. Moreover, FinTech company might be obliged to disclose given ESG data as an investee company, if its investor is covered by Sustainable Finance Disclosure Regulation (SFDR). SFDR requires some financial companies to disclose so-called PAI (principal adverse impact) indicators referring to companies they invest in. Thus, some FinTech companies might be obliged to prepare for ESG obligations even if they are not covered by ESG regulations directly.

Moving to direct applications of ESG regulations, some FinTech companies might be obliged to disclose ESG data based on the Corporate Sustainability Reporting Directive (CSRD). CSRD requires companies to prepare so-called ESG reports (non-financial reports) covering environmental, social and governance aspects from the sustainability point of view. Considering that many FinTech companies have not reported ESG data before, preparing a report may prove to be a big challenge. One of the crucial issues regarding reporting is ensuring that disclosed information does not impose a risk of greenwashing (or various types of ESG-washing, such as social-, pink- and blue-washing).

Among FinTech companies there are numerous financial institutions, whose operations are strongly regulated by law, ESG regulations included. Those FinTech companies are already obliged to implement ESG aspects and ESG risks in their investment decision-making process based on SFDR and incorporate ESG aspects into MiFID II policies and procedures (such as suitability assessment and target market assessment of investment products). Main challenge in this regard is the lack of data to assess financial products and investee companies from an environmental, social and governance point of view.

In the process of implementation of ESG regulations, FinTech companies might face similar challenges to companies operating in other sectors. Firstly, ESG regulations are deemed to be complicated and unclear, so implementation of those might require legal support. Secondly, since the pace of entry into force of ESG requirements is quite fast and companies cannot keep up with adapting to the new requirement, ESG implementation might be a challenge from the compliance point of view. Thirdly, since ESG data has not been disclosed by many companies before, there's a crucial issue of lack of reliable ESG data.

Moving to advantages, FinTech companies might benefit from implementation of ESG regulation. Companies that have implemented environmental and human rights standards are more likely to establish business relationships with large companies, many of which require their suppliers to sign ESG codes of conduct. Moreover, since institutional investors are obliged to assess investee companies from ESG point of view, it is more likely to obtain financing if a company is ESG-compliant. In the long term, taking into account ESG risks may provide the company with greater resilience to a changing environment or society. What's more, ESG opens up business opportunities for many FinTech companies, regarding for example carbon footprint assessment and Taxonomy qualification.

EXPLORING THE INTERSECTION OF GREEN AND DIGITAL TWIN TRANSITIONS WITHIN THE SHARING ECONOMY

ANNA MOSKAL, MONASH UNIVERSITY

The sharing economy is based on the concept of providing financial or free temporary access to underutilised physical or human resources, usually through the intermediation of online platforms. In today's digitalized world, these new business models based on on demand platforms, which facilitate connections between peers interested in sharing resources, are rapidly growing in popularity. Uber and Airbnb, which are considered two flagships of the sharing economy, have revolutionised and dominated the transportation and accommodation market respectively.

This research study examines the sharing economy as a sector in which the green and the digital transitions can mutually reinforce each other, creating a mutually beneficial relationship. It analyses how current and future digital technologies could become key enablers for the green transition by taking as case studies the two most dominant sectors of the sharing economy – transportation and accommodation. It assesses how economic, political and social factors might impact the twin transitions, as well as examines challenges and tension points between them.

On this basis, the study derives key requirements for the successful management of the twin transitions in the sharing economy. By leveraging digital technologies and collaborative consumption, we can optimize resource utilization, reduce waste, and promote sustainable practices across various sectors. However, realizing this potential requires concerted efforts from lawmakers, industry stakeholders, and society at large. By embracing the synergies between the green and digital twin transitions within the sharing economy sector, we can pave the way towards a more sustainable and prosperous future.

The article touches on a very important issue - safety in civil aviation through the application of ethical artificial intelligence using the example of aircraft engine manufacturer Rolls-Royce. The dynamic development of artificial intelligence and the related categories of safety, adaptability, metaversum and code control through checklists creates a completely new perspective on the development of the aviation industry.

HUMAN-CENTRIC AI: BRIDGING SOCIOLOGICAL INSIGHTS AND PHILOSOPHICAL ETHICS IN MEDICAL AND FINANCIAL INDUSTRIES

PHD DOTA SZYMBORSKA, COLLEGIUM HUMANUM, WSB MERITO

In the rapidly evolving landscape of AI technology, there is a pressing need to develop and implement ethical frameworks that not only prioritize human-centricity but also sustainability. Drawing from my dual academic backgrounds in philosophy and sociology, this presentation seeks to explore the symbiotic relationship between human values and AI systems, particularly within the medical and financial sectors.

The main focal points of the presentation are:

- The Sociological Dimension: Unveiling sociological patterns and how they influence users' trust and expectations towards AI solutions. In the medical field, this could translate to patient trust in AI diagnostics. In the financial realm, it pertains to user reliance on AI for investment advice or fraud detection.

- The Philosophical Perspective: Delving deep into the moral imperatives behind designing AI systems. It's essential to recognize that AI decisions, especially in sensitive sectors like health and finance, bear profound ethical implications. By weaving philosophical principles into AI, we can ensure decisions made by these systems are not just efficient, but also ethically sound.

- Human-Centric Design in Practice: Practical case studies from both medical and financial industries showcasing successful (and unsuccessful) integration of 'ethics by design' approach. By evaluating real-world implementations, we aim to derive best practices and potential pitfalls.

- Sustainability in AI: Emphasizing the importance of sustainable AI solutions, not just from an environmental standpoint, but also in terms of longevity and adaptability. Sustainable AI is about creating systems that are resilient to changes and can evolve with the ever-shifting ethical norms of society.

- In conclusion, the presentation aims to provide a holistic viewpoint on integrating 'ethics by design' in AI systems across industries, ensuring they are aligned with human values, sociological insights, and sustainable development goals.

DEVELOPMENT OF A METHOD TO DESIGN, FIT, AND MANUFACTURE MEDICAL ORTHOSES TO SUIT THE ANATOMICAL SITUATION DURING THE RECOVERY PERIOD

ANDRZEJ ZAKRĘCKI, AGH UNIVERSITY OF TECHNOLOGY AND SCIENCE, FACULTY OF MECHANICAL ENGINEERING AND ROBOTICS, DEPARTMENT OF MANUFACTURING SYSTEMS

The process of designing a forearm orthosis requires the designer to have knowledge of forearm injuries, CAD design techniques and manufacturing technologies, among others, 3D printing. In the work presented here, a method for designing forearm orthoses using HP MultiJet Fusion (HP MJF) and Selective Laser Sintering (SLS) technologies was developed. This paper presents the use of 3D scanning technology based on the 3D Structure Sensor Pro scanner to prepare a virtual model of the forearm for designing an orthosis on it. A comprehensive analysis of the polyamide PA12 material from which the orthosis was designed was carried out. Tensile test, bending test, measurement of roughness, hardness were performed. Data related to the design process of the orthosis based on the anatomy of the forearm injury and the position of the forearm hand along with the adjustment system were prepared. An orthosis design scheme based on the development of size groups was developed. Strength analysis of the orthoses was carried out. Orthoses were fabricated using HP MJF and SLS technology along with their finishing by DyeMansion finishing methods. The final solution is a forearm orthosis with an adjustment system. In this paper, the design process of the forearm orthosis by 3D printing was carried out from conceptual work to the fabrication of the finished product.

We will present the Ethics by Design for Artificial Intelligence approach we developed in the SIENNA project and which was adopted by the European Union in 2022. All EU research funding applications for AI (€1.5 billion per year) must now demonstrate conformity to this approach. It is also the EU's recommended strategy for development of AI systems which hope to comply with the Artificial Intelligence Act which will be enacted in 2024. Indeed, many of the clauses in the Act require a system be capable of delivering the functionality which AI Ethics by Design promotes. Our approach can be described in a five-layer model. This model is similar to many others in computer science in that higher levels are more abstract, with increasing levels of specificity going down the levels.

Ethics by design values – These are the primary ethical values by which we want to guide the ethical status of an AI or robotics system. Where a system violates these values, it may be considered unethical. Values are to be upheld and enhanced. Our six core values are: Human Agency; Privacy and Data Governance; Fairness; Well-being; Accountability and Oversight; Transparency. These values incorporate a number of more detailed ethical values, such as autonomy, freedom, and justice, into a set of six according to the manner in which they combine to create requirements specific to AI.

Ethics requirements – Requirements are the conditions that a solution or application must meet in order to achieve its goals. In Ethics by Design, requirements are instantiations of values within AI and robotics systems. Values may be instantiated in many ways; through functionality, in data structures, in the process by which the system is constructed, and so forth. For example, one way the value of fairness can be instantiated as an ethical requirement is to require that a system does not exhibit racial bias. The six Ethics by Design values are translated into twenty-eight ethics requirements which an AI system must meet in order to be considered ethically sound.

Ethics by design guidelines - Whereas ethics requirements were concerned with the system, guidelines are concerned with the steps by which the system is created. They are presented in the form of concrete tasks which must be undertaken if the system is to meet its ethical requirements. Recognizing that there are multiple development methodologies, Ethics by Design uses a reference model for the generic development process. Individual tasks are then mapped to specific phases in this model. Individual methodologies can incorporate these tasks into their own methodology by mapping their processes to the reference model. The six elements of the generic model are:

- Specification of objectives. This is the determination of what the system is for, and therefore what it should be capable of doing.

- Specification of requirements. This is development of the technical and non-technical requirements and constraints by which to build the system. This includes initial determination of required resources, together with an initial risk assessment and cost-benefit analysis, resulting in a design plan.

- High-level design. This is the development of a high-level architecture and is sometimes preceded by the development of a conceptual model.

- Data collection and preparation. For systems that involve data processing, data must be collected, verified, cleaned, formatted and integrated.

- Detailed design and development. This involves the actual construction of a full working system. For software development, this will involve programming and coding. Robotic systems will also include a manufacturing component.

- Testing and evaluation. This is the process of testing of the system and evaluation against the original objectives and requirements. We proceed to map the ethics requirements from Layer 2 (ethical requirements) onto these phases. This yields specific guidelines, formulated as tasks, at each phase which ensure that the final system instantiates the ethics requirements and therefore does not violate any of them. For example, the guidelines state that during the data gathering stage, data should be screened for fairness and any discriminatory bias corrected.

AI Methodologies – There are a variety of methodologies used in AI and robotics projects. They are, at least partially, distinguished by the manner in which they organise the development process. Each methodology offers its own steps and sequence. Here Ethics by Design maps its principles onto the components of each individual methodology. We explain how phases or practices in different design methodologies for AI can be mapped onto our generic model. By mapping the steps in the generic development process to their own methodology, research can relate our ethics guidelines to the appropriate steps in their methodology.

Tools & Methods – The Tools and Methods layer accommodates specific programmatic artefacts and processes deployed within the development process to undertake Ethics by Design. This element of the model accommodates independent development of tools and methodologies which support Ethics by Design, such as Model Cards (Mitchell et al. 2019) and Explainability Fact Sheets (Sokol and Flach 2020).

In our paper, we will explain these five layers the process by which developers can utilize in Ethics by Design. This involves three steps. First, developers map our generic design model onto their favored design methodology. Second, they apply the ethics guidelines at each relevant stage or practice in the design process. The ethics guidelines are task-specific and are meant to provide prima facie instructions that can be carried out by designers in the development process. Ideally, however, designers are trained in Ethics by Design at a previous point in time. We argue that our Ethics by Design approach enables developers to engage with ethical considerations in a proactive way, instead of the reactive approach offered by research ethics and ethics assessment. It is moreover an approach that builds on the emerging consensus regarding the ethical guidelines for AI, such as those of the IEEE, OECD, UNESCO and EU.

LED BY EXAMPLE: INTRODUCTION TO TECHNO-SOCIAL CHALLENGES IN SUSTAINABLE PUBLIC ARCHITECTURE

DOMINIK ZIELIŃSKI, ŁUKASIEWICZ RESEARCH NETWORK — ITECH INSTITUTE OF INNOVATION AND TECHNOLOGY

Currently, urban areas are facing multiplying challenges in development. Particularly burdensome is climate change, which is countered by the megatrend of sustainable architecture. In practice, this translates into building standards that incorporate environmentally friendly construction methods (such as closed-loop systems) and a reduction in energy consumption throughout the building's lifecycle. However, the challenge of sustainable construction is a techno-social challenge.

First and foremost, research shows that current standards may prove insufficient to stop climate change. On the other hand, more effective reduction of GHG may be associated with a noticeable reduction in comfort, which, according to some researchers, is inevitable. This poses a danger that sustainable architecture may not be marketable, hindering its development.

A series of challenges related to sustainable architecture prompt reflection on systemic change. According to concepts of narration and reception, public institutions can shape a sustainable and resilient urban space. The Polish state allocates approximately 283 mil PLN annually for public procurement. Such a scale of expenditure can have a significant impact on the urban fabric.

Cities are a field of constant change in the social and technological dimension, and the influence of public institutions on their sustainability is invaluable. This paper serves as a theoretical introduction to the planned research.

RRI, SDG, AND RESEARCH INTEGRITY

VEIKKO IKONEN, VTT TECHNICAL RESEARCH CENTRE OF FINLAND LTD

VTT Technical Research Centre of Finland Ltd is one of the largest research institutes in Europe. This presentation will describe the updated and current measures at VTT on how to combine together ethics, responsible research and innovation, sustainability and research integrity.

Recently, VTT has started a couple of actions, in order to strengthen our capabilities to always act ethically and sustainably. First action in 2022 was to start to organise Ethics and safety research team workshops. Between 2022 June and 2023 June, we organised around 40 team workshops, which include short introductions to 4 themes (sustainability, ethics, safety and Diversity, Equity and Inclusion). This presentation will share experiences of those workshops and how we plan to continue with workshops in two other business areas. In December 2022 we launched an online course on research ethics, which was compulsory to the most of the VTT personnel. Course was based on TENK guidelines but did had some more specific guidance for publishing and general view to ethics in research as such. Next version of the course will be launched either 2024 or 2025. We have collected feedback about workshops and also from the online course, which will be used to find out potential needs from participants regarding the course and future workshops.

EDUCATION FOR RESPONSIBLE DEVELOPMENT OF TECHNOLOGY

GOSIA PŁOTKA, UNIVERSITY OF NORTHAMPTON

It is 2023, after years of keeping a blind eye on the matter for the last 3-4 years, we have been debating the ethical use of technology (Chui et al., 2022). Although the term computer ethics has been known for decades (Maner, 1999). What if instead of thinking about another regulation, we start by designing education for the future? There is already a requirement that computing-related courses include content to raise awareness among future generations of professionals.

Some of them are very reasonable (Stavrakakis, Gordon & O'Sullivan, 2021) Others cover just the basics. Why is it so difficult (Patrignan & Kavathatzopoulosi, 2017)? Why could not we treat computer ethics as any other subject (Hedayati-Mehdiabadi, 2022)? As explained by Costa and Pawlak (2018), it is important (and difficult at the same time) to make ethics-related modules interesting and relevant to the actual practice of people working in the field. As one of my students said a while ago, "Ethical use of tanks, is not an engineer's concern" (Boughton & Plotka, 2011).

During this presentation, I would like to discuss with you where there is a place for education in a bigger Responsible Development of Technology master plan. I plan also to share what I learnt over the years working with future technology developers. And how it informed my blueprint for education that not only helps us feel protected but, also importantly, ensures we get prepared to prevent people from consequences of ill-designed solutions.

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