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**VIRT-EU**
**Values and ethics in Innovation for Responsible Technology in Europe**
Horizon 2020
ICT-35-2016
Enabling responsible ICT-related research and innovation
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# D7.4
# Curriculum Development

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**Project Consortium**

| Beneficiary no. | Beneficiary name | Short name |
|---|---|---|
| **1 (Coordinator)** | IT University of Copenhagen | ITU |
| **2** | London School of Economics | LSE |
| **3** | Uppsala Universitet | UU |
| **4** | Politecnico Di Torino | POLITO |
| **5** | Copenhagen Institute of Interaction Design | CIID |
| **6** | Open Rights Group | ORG |

**Dissemination Level**

| | | |
|---|---|---|
| **PU** | Public | **X** |
| **CO** | Confidential, only for members of the consortium (including the Commission Services) | |
| **EU-RES** | Classified Information: RESTREINT UE (Commission Decision 2005/444/EC) | |
| **EU-CON** | Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC) | |
| **EU-SEC** | Classified Information: SECRET UE (Commission Decision 2005/444/EC) | |

**Dissemination Type**

| | | |
|---|---|---|
| **R** | Document, report | |
| **DEM** | Demonstrator, pilot, prototype | X |
| **DEC** | Websites, patent filling, videos, etc. | |
| **O** | Other | |
| **ETHICS** | Ethics requirement | |

# Table of Contents

## Executive summary

Concerns about the impact of IoT technology, AI and big data on contemporary societies have motivated calls for educators to respond. As some have argued: “If you work in tech and you are not thinking about ethics you are bad at your job”[1]. As a result educators across Europe and North America have been working to develop course materials and bibliographies that would integrate considerations of ethics into a range of different educational efforts. The VIRT-EU consortium was aware of this burgeoning need from the very beginning and has organized some of the dissemination activities towards addressing it.

Deliverable 7.4 ‘’Curriculum Development’’ is part of activities in Work Package 7 ‘’Communication, Dissemination and Exploitation’’. This deliverable provides examples of multi-disciplinary syllabi and educational activities applied in classroom to help advance study and teaching in support of ethics in design, collective data protection, privacy by design and innovation. It contains examples for teaching best practices in SSH-ICT collaboration and best practices in RRI at different levels of education – from bachelor to PhD – developed by VIRT-EU researchers.

Going beyond regular teaching activities, partners have also leveraged available institutional arrangements such as LSE’s Media Policy Project and ITU’s Experimental Techno-Humanities and Organizational Services (ETHOS) lab to conduct information sessions with local communities while CIID has developed a series of educational workshop and co-design sessions for engaging working developers as well as technical and design students.

The courses are interdisciplinary inviting for innovative theoretical and practical engagements with ethics and data. They have been tested in classrooms, and ready for further usage.

VIRT-EU consortium partners will continue to develop teaching materials and resources until project end. The multi-disciplinary syllabi along with an extended bibliography will be made available on the project website throughout the course of the final year of the project.

[1] https://howwegettonext.com/what-our-tech-ethics-crisis-says-about-the-state-of-computer-science-education-a6a5544e1da6

## Data governance, Ethics and Design, with cases on AI and Smart Cities. MSc level.

***- Alison Powell, LSE, 2018***

**Issues in Data Governance**

This lecture looks at modes of organisation of data and the consequences of employing different models of data organisation and access. Examining the promise of data commons alongside other proposals to organise data in 'collaboratories' or cooperatives, this lecture examines how politics and power appear in discussions about the organisation and use of data, particularly conflicting ideas of data sovereignty.

Required reading:

- British Columbia First Nations Data Governance Initiative. http://www.bcfndgi.com/
  History and Future
  Concept Paper
- Frischmann, B. M., Madison, M. J., & Strandburg, K. J. (Eds.). (2014). *Governing knowledge commons*. Oxford University Press. Introduction.
- Verlhurst, S, Young, A. and P. Srinivasen. (2016) An Introduction to Data Collaboratives. Creating Public Value By Exchanging Data.

Recommended reading:

- Balestrini, M., Rogers, Y., Hassan, C., Creus, J., King, M., & Marshall, P. (2017, May). A city in common: a framework to orchestrate large-scale citizen engagement around urban issues. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 2282-2294). ACM.
- Drake, W. Cerf, V. and W. Kleinwächter. (2016) Internet Fragmentation: An Overview. Future of the Internet Initiative White Paper: World Economic Forum.
- Graham, Mark, and Laura Mann. "Imagining a silicon savannah? Technological and conceptual connectivity in Kenya's BPO and software development sectors." *The Electronic Journal of Information Systems in Developing Countries* 56.1 (2013): 1-19.
- Taylor, L and R. Schroeder – Is Bigger Better? The Emergence of Big Data as a Tool for International Development Policy. GeoJournalAugust 2015, Volume 80, Issue 4, pp. 503–518.
- Polatin-Reuben, D., & Wright, J. (2014, July). An Internet with BRICS Characteristics: Data Sovereignty and the Balkanisation of the Internet. In *FOCI*.
- Kukutai, T. and J. Taylor (2017). Indigenous Data Sovereignty: Towards an Agenda. Associated website: https://www.temanararaunga.maori.nz/
- Sandra Wachter, Brent Mittelstadt, Luciano Floridi; Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation, *International Data Privacy Law*, Volume 7, Issue 2, 1 May 2017, Pages 76–99, https://doi.org/10.1093/idpl/ipx005

**Data System Design, within and beyond Ethics?**

We will explore questions of design in relation to data systems that collect, curate and calculate data, and investigate their social and cultural implications. It includes discussion of two research projects, the Understanding Automated Decisions project and the Virt-EU project exploring ethics, values and the Internet of Things. Where should considerations of ethical and social impact be placed with design or governance processes? How should these issues be addressed within workplace contexts? What are the possibilities for changing design practices based on an understanding of datafication?

Required reading:

- Metcalf, J., & Crawford, K. (2016). Where are human subjects in big data research? The emerging ethics divide. *Big Data & Society*, *3*(1), 1-14.
- Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. *Big Data & Society*, 3(2), 1-21.
- Pink, Ruckstein and Willim (2018) Broken Data: Conceptualizing Data in an Emerging World. Big Data and Society January 2018.

Recommended reading:

- Aradau, C., & Blanke, T. (2016). Politics of prediction Security and the time/space of governmentality in the age of big data. *European Journal of Social Theory*, 1368431016667623.
- Dijck, J. van (2014). Datafication, Dataism and Dataveillance: Big Data between Scientific Paradigm and Ideology. *Surveillance & Society*, 12(2), pp. 197–208.
- Esposti, S. (2014). When Big Data Meets Dataveillance: The Hidden Side of Analytics. *Surveillance & Society*, 12(2), pp. 209-225.
- Building digital trust: The role of data ethics in the digital age (Accenture Labs) https://www.accenture.com/t00010101T000000Z w /gb-en/ acnmedia/PDF-22/Accenture-Data-Ethics-POV-WEB.pdf#zoom=50
- Mantelero, Alessandro (2018) AI and Big Data: A blueprint for a human rights, ethical and social impact assessment. *Computer Law and Security Review.*
  *DOI: https://doi.org/10.1016/j.clsr.2018.05.017*

**Also look at:**

- **MIT's Moral Maze** https://www.media.mit.edu/projects/moral-machine/overview/

**Cultures of AI**

We will examine the socio-cultural features associated with the development of AI technologies over the past four decades, and also ask questions about the extent to which we should pay attention to the materiality of our technical systems. What happens when outcomes are outside of the features that we can control? When sensed data takes on a life of its own? Our reading focuses on the ways that certain patterns of scientific investigation produce particular assumptions about technology design.

Required reading:

- Brunton, Finn, and Gabriella Coleman (2014). "Closer to the Metal". In: Gillespie et al., *Media Technologies: Essays on Communication, Materiality, and Society,* 77.
- Ensmenger, Nathan. "Is Chess the Drosophila of Artificial Intelligence? A Social History of an Algorithm." *Social Studies of Science* 42, no. 1 (2012): 5–30.
- Schüll, Natasha Dow. "Mapping the Machine Zone" in *Addiction By Design: Machine Gambling in Las Vegas,* 1–27. Princeton: Princeton University Press, 2012.

Recommended:

- Beer D. (2009) 'Power through the algorithm? Participatory web cultures and the technological unconscious', *New Media & Society*, 11(6), pp. 985–1002.
- Chun, Wendy Hui Kyong. *Control and Freedom: Power and Paranoia in the Age of Fiber Optics.* Cambridge, MA: MIT Press, 2006.
- Cohn, Marisa. "" Lifetime Issues": Temporal Relations of Design and Maintenance." *continent.* 6, no. 1 (2017): 4-12.
- Daipha, Phaedra. *Masters of Uncertainty: Weather Forecasters and the Quest for Ground Truth.* Chicago: University of Chicago Press, 2015.
- Ensmenger, Nathan. "Software as History Embodied." *IEEE Annals of the History of Computing* 31, no. 1 (2009): 86–88.
- Galloway, Alexander R. *Protocol: How Control Exists after Decentralization.* Cambridge, MA: MIT Press, 2004.
- Galloway, Alexander R., and Eugene Thacker. *The Exploit: A Theory of Networks.* Minneapolis: University of Minnesota Press, 2007.
- Gillespie, Tarleton. *Wired Shut: Copyright and the Shape of Digital Culture.* Cambridge, MA: MIT Press, 2007.
- Jain, Sarah S. Lochlann. *Injury: The politics of product design and safety law in the United States*. Princeton, NJ: Princeton University Press, 2006.
- Kennedy, Devin. "The Machine in the Market: Computers and the Infrastructure of Price at the New York Stock Exchange, 1965–1975." *Social studies of science* 47, no. 6 (2017): 888–917.
- Kohler, Robert E. *Lords of the fly: Drosophila genetics and the experimental life*. Chicago: University of Chicago Press, 1994.
- Lessig, Lawrence. *Code: Version 2.0.* New York: Basic Books, 2006.

- Mackenzie, Donald A. *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance.* Cambridge, MA: MIT Press, 1990.
- Mager, Astrid (2012) Alogrithmic Ideology: How capitalist society shapes search engines *Information, Communication and Society* Volume 15, Issue 5, June 2012, pages 769-787.
- Mahoney, Michael S. "Finding a history for software engineering." *IEEE Annals of the History of Computing* 26, no. 1 (2004): 8–19.
- Shell, Hanna Rose. *Hide and Seek: Camouflage, Photography, and the Media of Reconnaissance.* New York: Zone Books, 2012.
- Vertesi, Janet. *Seeing Like a Rover: How Robots, Teams, and Images Craft Knowledge of Mars.* Chicago: University of Chicago Press, 2015.

**Optimizing Space and Civic Participation: Smart Cities**

Can civic life be made more optimal using data, sensors and 'ambient' urban media technologies? We look at the promises and critiques of the idea of optimized social life (including Internet of Things) in the case of the smart city.

Required:

- Gabrys, Jennifer (2016) *Program Earth.* University of Minnesota Press.
- Sadowski, J., Pasquale, F. (2015). The Spectrum of Control: A Social Theory of the Smart City. *First Monday*, 20(7).

Recommended:

- Gordon, E. and de Souza e Silva, A. (2011). Chapter 2: Mobile annotation. In: *Net Locality Why Location Matters in a Networked World*. Wiley-Blackwell, pp. 40-58.
- Graham, Stephen, and Simon Marvin. *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition.* London; New York: Routledge, 2001.
- Kitchin, R. (2013). The Real-Time City? Big Data and Smart Urbanism. *SSRN Scholarly Paper*. Rochester, NY: Social Science.
- Mattern, Shannon (2017) *"A City Is Not a Computer," Places Journal, February 2017. Accessed 23 Nov 2018. https://doi.org/10.22269/170207*
- O'Brien, Daniel (2018) The Urban Commons: How data and technology can rebuild our communities.
- Powell, Alison (2014) *'Datafication', transparency, and good governance of the data city.* In: O'Hara, Kieron and Nguyen, Carolyn and Haynes, Peter, (eds.) Digital Enlightenment Yearbook 2014: Social Networks and Social Machines, Surveillance and Empowerment. ISO Press Ebooks, pp. 215-224.
- Ratti, Carl and Matthew Claudel. *The City of Tomorrow: Sensors, Networks, Hackers, and the Future of Urban Life*. New Haven: Yale University Press.

## Writing Innovation Studio – based on VIRT-EU materials. MSc level.

***- Rachel Douglas-Jones et.al., ITU, 2016 & 2017***

**Project Box Contents:**

1. Academic paper 1 – Baldini, G., Botterman M, Neisse R and Tallacchini M. (2016) Ethical Design in the Internet of Things. *Sci Eng Ethics* online first
2. Academic paper 2 – Peppet, S. (2014) Regulating the Internet of Things: First Steps Toward Managing Discrimination, Privacy, Security and consent. *Texas Law Review* 93:85.
3. Academic paper 3 – Shin,D. (2014) A socio-technical framework for Internet-of-Things design: A human-centered design for the Internet of Things. *Telematics and -informatics* 31:519-531.
4. Project Proposal – Values and Ethics in Innovation for Responsible Technology in Europe (VIRT-EU)
5. European Commission, Data Protection Working Party WP223. Opinion 7/2014 on the Recent Developments on the Internet of Things
6. URL Links

**6. URL Links:**

IoT council, a think tank for the internet of things: http://www.ethicsinside.eu/

Video from the launch of the VIRT-EU project: https://itu.dk/tip/virt-eu-launch-video-live/

Peter McOwan 2014 When Fridges Attack, edited presidential lecture of the Mathematical Sciences section of the British Science Association https://www.theguardian.com/science/alexs-adventures-in-numberland/2014/sep/08/when- fridges-attack-the-new-ethics-of-the-internet-of-things

Ethical Programming:http://www.computerweekly.com/news/2240242453/IoT-and-smartdevices-need-ethical- programmers-says-Gartner

Berkeley School of Information. The Ethics, Privacy and Legal Issues around the Internet of Things: https://www.ischool.berkeley.edu/projects/2015/ethics-privacy-and-legal-issues-around-internet-things (including links to paper and presention on 'Guiding the Future')

Check Your Settings: Alexa: http://www.theverge.com/2017/1/7/14200210/amazon-alexa-tech-news-anchor-order-dollhouse http://fortune.com/2017/01/09/amazon-echo-alexa-dollhouse/

Blogpost on hacking lightswitches: http://mjg59.dreamwidth.org/40505.html

Forbes: On the Ethical use of Data vs. the Internet of Things: http://www.forbes.com/sites/ciocentral/2016/12/21/on-the-ethical-use-of-data-vs-the-internet-of- things/#1093c7407853

The Internet of Things: 7 Challenges: http://www.datamation.com/data-center/the-internet-of-things-7-challenges.html. A broader look at the implications

**Overview**

Writing is an essential craft. Yet few, except professional writers, take the time to develop this skill. Writing clear, concise, and compelling arguments–knowing how to construct and tell a persuasive story–is crucial across industry and the digital world. Well-designed narratives can change the fortunes of a product, community, or company.

This is a practice-based course that will provide students with a set of word crafting tools and an online studio space to explore how to write for the public, industry colleagues, executive management, and academic specialists. Students will gain experience in creative writing techniques and storytelling, along with tools for working with diverse empirical data. They will learn how to transform given research material and ideas into compelling texts in a variety of formats, from press releases and executive summaries, to podcasts and editorial blog posts.

Emphasis is on written communication, but spoken and visual communication skills will also be included. Students will learn how to present and write for both conventional text, and a range of multimedia and digital platforms.

This course is open to all Masters students. The course is taught in English and writing will be in English, but this is not a language course, nor are there language requirements. The only requirement is a willingness to experiment with writing, and a commitment to write regularly as part of the course.

**Course Structure**

The course is structured in 6 sections, each lasting 2 weeks. Each section will focus on a different writing format, and different writing skills.

- Summarising: How to read and condense an extended argument into a short abstract or summary.
- Refining: How to write succinct and clear arguments for a high-level, executive audience, and develop good drafting practice.
- Persuading: The art of persuasion and how to write with brevity and visual clarity on the page.
- Data Working: What counts as good data, and how to use it in constructing text for the press and news.
- Storytelling: Using techniques from creative writers and authors to construct more compelling arguments for a public audience.
- Vocalising: Using oral and spoken voice techniques to improve your writing, and to produce a script.

**Writing Focus**

There is no empirical research required for this course. Instead, students will focus on an existing research project at the ITU. This project will provide the empirical data and latest news that the student will reflect on in their writing. Students can choose which research project they wish to write about.

Several research projects will be offered, such as the Alien Energy research project on renewable energy; or a Big Data research project involving industry partners such as the VIRT-EU prpject.

**Syllabus**

**Toolkit: Being Stylish**

These texts give some basic guidelines to good writing. We will be using and referring to them throughout the studio course.

Week 1 (3 Feb)

- Strunk WJ and White EB (1979) An Approach to Style. The Elements of Style.
- London, Boston, Toronto: Allan and Bacon.
- Camp, Lindsay (2007) Understanding your reader. Can I Change Your Mind?: The Craft and Art of Persuasive Writing. AC Black, London.

**Toolkit: Peer Critique**

This toolkit will develop your skills in critical reading and writing. How to read and analyse different kinds of writing, from online news to journal articles; how to give clear and constructive criticism; what are the politics performed by different writing choices.

Week 2 (10 Feb)

- Bunn, Mike (2011) How to Read Like a Writer. Writing spaces: readings on writing. Volume 1 (Eds) Charles Lowe and Pavel Zemliansky. Open source textbook http://writingspaces.org/essays
- Dumit, Joseph (2012) How I Read: Notes on reading modes sent to a grad class. Available from: http://dumit.net/how-i-read
- Orwell, George (2000) Politics and the English Language, in Essays. New Ed edition. London: Penguin Classics. (First published in 1946).

Week 3 (17 Feb)

- Studio (No Reading)

**Toolkit: Visual Communication**

Persuasive and clear writing is not just about the words you use, but also the visual language. This toolkit will combine your skills in critical writing with visual media, to produce a document that is the essence of brevity and precision in communication.

Week 4 (24 Feb)

- Calvillo N, Jiménez AC, Dias H, et al. (2010) infra(proto)types In The Air & what gets prototyped. PROTOTYPING PROTOTYPING. Anthropological
- Research on the Contemporary (ARC). Available from: http://core.kmi.open.ac.uk/download/pdf/1446360.pdf
- Ulmer JB and Koro-Ljungberg M (2015) Writing Visually Through (Methodological) Events and Cartography. Qualitative Inquiry 21(2): 138–152.
- Williams, H. R. and Harkusm, D. (2003) Editing Visual Media in Beer DF (ed.) Writing and Speaking in the Technology Professions: A Practical Guide. New York: Wiley-IEEE Press.

Week 5 (3 Mar)

- Studio (No Reading)

**Toolkit: Making Facts**

What counts as good data, and how to use it in constructing accounts for the press and news. What is the difference between Fact/Fiction and how are they entangled in practice; how facts are made; what counts as empirical 'good' data; what is truth in terms of scientific fact making; how to reference and cite, and why we reference and cite.

Week 6 (10 Mar)

- Mellor F (2003) Between Fact and Fiction: Demarcating Science from Non- Science in Popular Physics Books. Social Studies of Science 33(4): 509–538.
- Orr, J., (2006) 'Falling Objects' [an account of Orson Wells' radio broadcast of The War of the Worlds] in Panic Diaries: A Genealogy of Panic Disorder. Duke University Press Books, Durham N.C.
- Guin, U.K.L., (2004) Fact and/or/plus Fiction, The Wave in the Mind: Talks and Essays on the Writer, the Reader, and the Imagination. Shambhala Publications Inc.

Week 7 (17 Mar)

- Studio (No Reading)

**Toolkit: Executive Clarity**

Many people you will write for will have little time to read. We focus on the role of texts in workplaces, and examine ways of analysing them. What constitutes a succinct and clear argument, for an intelligent audience who may know nothing about what you are trying to convey? We focus on writing for high-level, executive management audiences, and the skill of writing effectively at speed or in collaboration.

Week 8 (24 Mar)

- Law, John (2007) Pinboards and books: Juxtaposing, learning, and materiality, in: Education and Technology: Critical Perspectives, Possible Futures. Lexington Books, pp. 125–149.
- Bloomfield, Brian and Theo Vurdubakis (1994) Re-presenting Technology: IT Consultancy Reports as Textual Reality Constructions. Sociology 28(2): 455- 477.
- Strathern M (2006) Bulletproofing: A Tale from the United Kingdom. In: Riles A, Biagioli M, Brenneis D, et al. (eds), Documents: Artifacts of Modern Knowledge, Ann Arbor: University of Michigan Press.

Week (31 Mar)

- Studio (No Reading)

**Toolkit: Storytelling**

What makes a both compelling argument, and a compelling story? Using techniques from creative writers and authors to construct more compelling arguments for a public audience, this toolkit will provide a framework for writing both good empirical arguments and good stories.

Week 10 (7 Apr)

- Sagan, C., Druyan, A. (1997) The Baloney Detection Kit, The Demon-Haunted World: Science as a Candle in the Dark. Ballantine Books, London.
- Hart, Jack. (2012) Story Narratives. Storycraft: The Complete Guide to Writing Narrative Nonfiction. University of Chicago Press, Chicago; London.
- Tsing, A., Ebron, P. (2015) Writing and rhythm: call and response with Anna Tsing and Paulla Ebron. Journal of Royal Anthropology Institute 21, 683–687.

EASTER

Week 11 (21 Apr)

- Studio (No Reading)

**Toolkit: Publication Ready- Form & Function**

Develop your editorial skills to refine and sharpen your writing so that it is ready for publication and to 'go live'. How to make choices about writing formats and functions that can alter its effects in the world; philosophy of scientific writing and identifying its effects on all empirical writing practices in academia and industry.

Week 12 (28 Apr)

- Watts, L (2014) Liminal Futures: A Poem for Islands at the Edge, in: Subversion, Conversion, Development: Cross-Cultural Knowledge Exchange and the Politics of Design. MIT Press, Cambridge MA.
- Marshall J (2000) Finding Form in Writing for Action Research In: Reason P and Bradbury-Huang H (eds), Handbook of Action Research: Participative Inquiry and Practice, London ; Thousand Oaks, Calif: SAGE Publications Ltd.
- King S (2000) On Writing: A Memoir of the Craft. London: Hodder and Stoughton.

Week 13 (5 May)

**Publication Ready- Form**

- Shapin, Steven. (1984) 'Pump and Circumstance: Robert Boyle's Literary Technology', Social Studies of Science 14: 481-520.
- Balsamo A (1999) Reading cyborgs, writing feminism. In: Wolmark J (ed.), Cybersexualities: A Reader in Feminist Theory, Cyborgs and Cyberspace, Edinburgh: Edinburgh University Press.
- Le Guin, Ursula K. (2004) Unquestioned Assumptions. The Wave in the Mind: Talks and Essays on the Writer, the Reader, and the Imagination. Shambhala Publications, Boston MA.

## Ethics Workshops designed for VIRT-EU. Mixed level.

***- Annelie Berner, CIID, 2017-2018***

The following are several proposals for teaching at CIID's summer schools. The CIID summer school programs occur around the world and are accessible for anyone (they are not restricted to designers only). We propose to teach the following possible modules in Copenhagen, DK.

**WORKSHOP 1**

Designing The Ethical Journey: create tools to bring ethical reflection into the design process

The connected devices around us are created with good intentions, but often generate vastly problematic, unforeseen consequences. In this workshop, we will work on tools for the creators of new connected products, focusing on the moments where decisions around data come in conflict with ethical values. How might we support designers and developers to take ethics into account throughout their product design process?

Participants will learn about 1) core ethical theories such as “care” ethics and 2) key design attributes such as “speculation” that we have identified in relation to these theories. Participants will work in groups to put these two elements together and design toolkits that support ethical thinking for designers and developers.

<u>Outcomes of the workshop will include:</u>

- learning about consequences of decision-making around data management: what data is throughout your product, how it flows, when it is exposed
- understanding foundational ethical theories
- toolkit for ethical thinking about data and design
- designing for difficult decision-making and speculative world-building

Keywords:
data, IOT, ethics, service design

**WORKSHOP 2**

Designing with Data: how can we integrate ethical thinking into how we design when we design with data?

At this moment, new ideas and products are being generated with a speed and agility that is as exciting as it is terrifying. While the excitement comes from the seemingly unlimited potential we have as designers and developers to work with technology, connected data and imaginative interfaces, the terrifying nature of these new products is often simply unforeseen, under thought and out of our sphere of knowledge until the moment when a clash occurs between the product we have created and the high values towards which we strive.

In this workshop, we will strive to create ethical connected products that make the invisible data flows and algorithmic processing visible. Participants will prototype connected products and use tools for ethical reflection about their products as they work, especially focusing on the use of data and the visibility of algorithms in product design.
Therefore, they will learn about challenges related to data protection and privacy, consider how the product can make more visible the algorithms and data flows that are often tidily packaged into a black box.

Throughout the workshop, we will share our ethical tools that we have designed as part of a larger European project on ethics, data and IOT. By using the tools and engaging in the workshop, participants will learn about 1) core ethical theories and 2) key design principles that we have identified in relation to these theories.

Outcomes of the workshop will include:
- prototyping connected products
- making the invisible visible
- understanding foundational ethical theories
- learning about consequences of decision-making around data and algorithms

Keywords:
data, algorithms, ethics, IOT

**WORKSHOP 3**
More and more data flows into and around our daily life, and new products are by default expected to be “smart” because of how they capture and capitalise upon the data they collect. How might we provide feedback for users and designers so that they can better understand the seemingly abstract data processing that is happening behind the scenes?

In this course, we will work with several products that are described as “smart” because of how they create and use data. We will examine: what does this “smartness” actually mean and how can we communicate the capturing and processing that goes into it?

Learn how to communicate ideas through video prototyping
Design system visualisations, bring mathematical concepts to life
Test + iterate
Analyse

At this moment, new ideas and products are being generated with a speed and agility that is as exciting as it is terrifying. While the excitement comes from the seemingly unlimited potential we have as designers and developers to work with technology, connected data and imaginative interfaces, the terrifying nature of these new products is often simply unforeseen, under thought and out of our sphere of knowledge until the moment when a clash occurs between the product we have created and the high values towards which we strive.

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Outcomes of the workshop will include:
- prototyping connected products
- making the invisible visible
- understanding foundational ethical theories
- learning about consequences of decision-making around data and algorithms

Keywords:
data, algorithms, ethics, IOT