



EMERGING TECHNOLOGIES, SPECULATIVE INTERACTION DESIGN AND ETHICS

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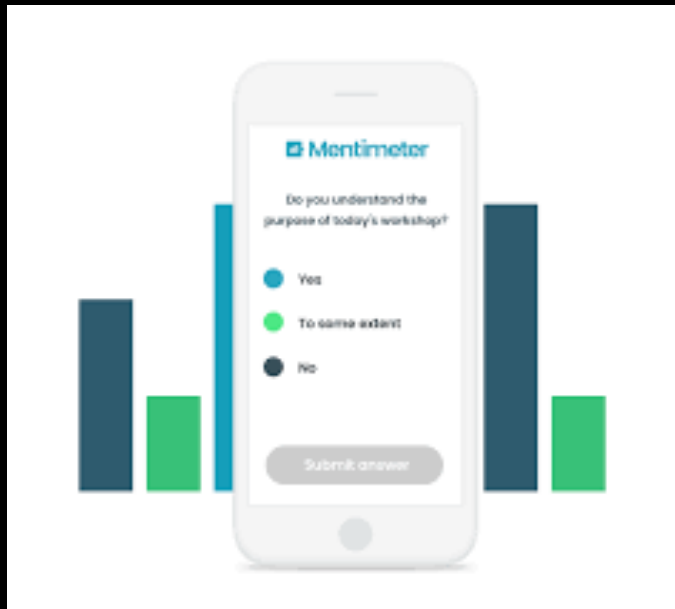
Gothenburg 2020 11 09

<http://gordana.se/>



EXAMPLES OF IMPORTANT ETHICAL ASPECTS OF EMERGENT TECHNOLOGIES

Before we start
discussing Ethics...



Question:

What are the most important ethical
questions of emerging technologies?

<https://www.mentimeter.com/>

Code: **22 61 96 0**

Ethics and System Design in a New Era of Human-Computer Interaction

<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8924731>

An underlying principle of HCI is the requirement the design and development of technology **be for the benefit of individuals (users) and society at large**, through the employment of distinct **user-oriented approaches and methodologies**. (...)

As technology pervades all aspects of our existence, and Artificial Intelligence (AI) and machine learning systems become commonplace, **a new era of HCI is emerging** that will involve directing our focus beyond traditional approaches, to span other intricate interactions with computer-based systems (...) some of which claim to be "intelligent" and **are visible, while others operate covertly and remain largely undetected**.

ETHICS BY DESIGN

<https://www.slideshare.net/EnjoyDigitAll/ethics-by-design-english-version> an illustration of the trend towards “ethics by design”

How much ethics can be built-in into artifacts?

Ethics is always in the end the results of use of those artifacts so humans must be involved in the loop – socio-technological or techno-social system!

Wicked Problems in Design Thinking

Richard Buchanan (1992) Wicked Problems in Design Thinking. Design Issues, Vol. 8, No. 2, pp. 5-21. The MIT Press

<http://www.jstor.org/stable/1511637>



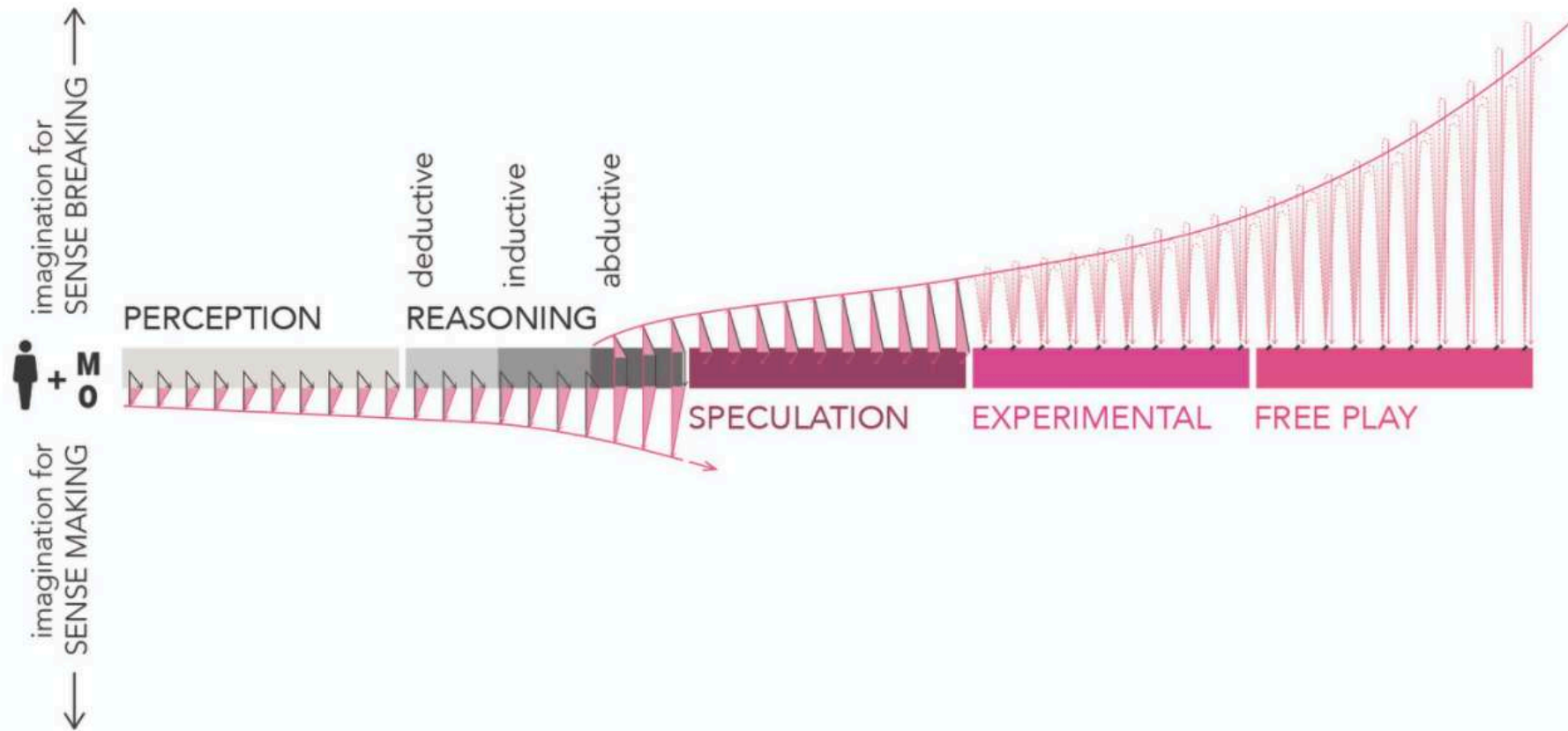
Design Unbound. Designing for Emergence in a White Water World

Ann Pendleton-Jullian and John Seely Brown, two volume set, MIT Press 2018

<https://mitpress.mit.edu/books/design-unbound-designing-emergence-white-water-world-volume-1>

Pragmatic Imagination Principles

The imagination serves diverse cognitive processes as an entire spectrum of activity.



<http://www.pragmaticimagination.com/pragmatic-imagination-principles>

Topics with Ethical Relevance

Emerging Technologies Focus

Data-related

- *Data provenance (attribution, background)*
- Data confidentiality
- Data privacy
- Public understanding of technology and protection of private data
- Data quality, property and equality
- Data-driven approaches
- Reproducibility of real time datasets
- Data is never "neutral"
- Data collection influences behavior
- Data-streching used in political purpose
- security and reliability of the IoT devices
- "Surplus data" from screening of patients that can reveal much more
- Transparency vs. quality

Sustainability-related

- Fuel economy, lower emissions, reduced take-off and landing noise
- Environmental contributions of battery production, use and disposal
- Environmental impact of massive electronic production
- Increasing demand of rare elements
- **Lack of life cycle assessment**
- **Rebound effect**
- Digital sustainability?

Topics with Ethical Relevance

Methodology Aspects

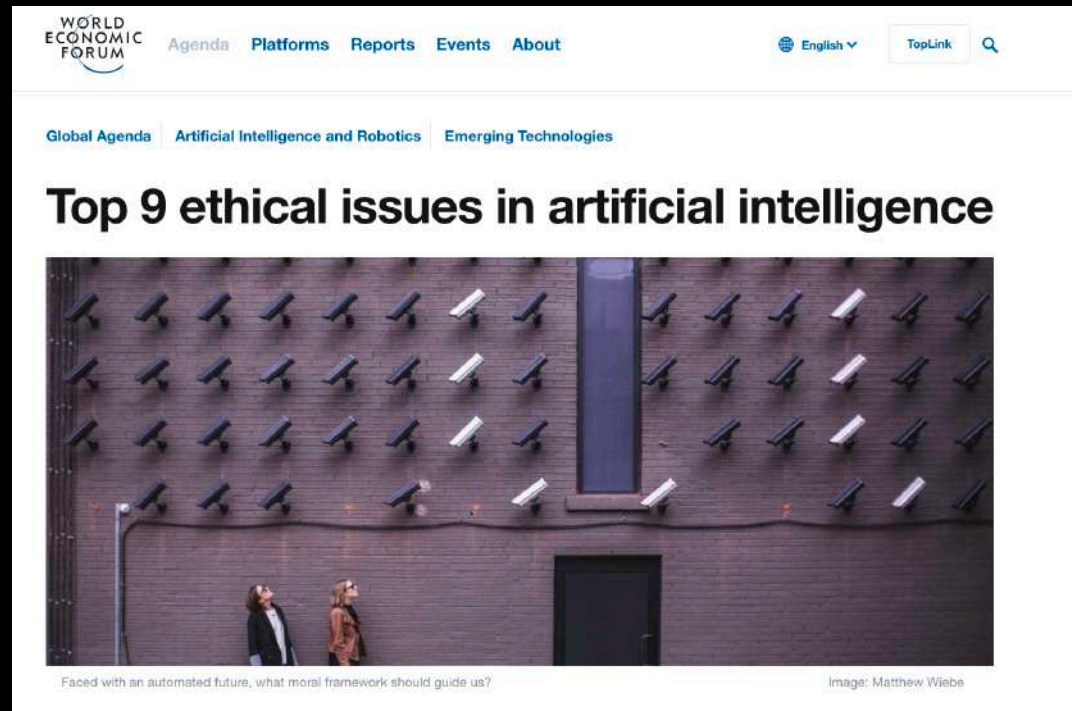
- Values
- The method
- Epistemic problems related work - acknowledging its limitations
- Reducing reality into a model, with loss of depth and variety of perspectives?
- Marginalizing the designer in the design process?
- Level of transparency is acceptable for an automated tool?
- Should we rely on automated tools if we consider the intrinsic limits of the learning process?
- Data-driven development methodology
- genetic discrimination
- genetic modification/engineering
- Tradeoff between safety and innovation
- OPEN SCIENCE
- Simulation compared to real experiments
- Making connection between qualitative and quantitative information
- Application of the complex system in Landscape studies
- Reproducibility
- System's performance almost always evaluated in isolation [QUESTION OF INTERPRETATION OF RESEARCH RESULTS]
- Authors do not verify their results thoroughly enough, or they hide complications
- THE REVIEW PROCESS IS NOT DOUBLE-BLIND
- Presentation of results (overemphasizing of their importance)
- Value of an intervention compared to other applications

Topics with Ethics Relevance

Social Aspects

- Cultural diversity
- Professional conduct
- Gender equality
- Quality of life
- Impact of technology on society at large
- Is the purpose of the analysis relevant enough to expose the users to privacy loss?
- Designing technology that could reduce the need for human employees?
- Entrusting the machine to define culturally relevant spaces for our cities?
- Legal issues related to copyright infringement
- Involving stakeholders/users
- Trust between stakeholders?
- Professional societies/organisations and Codes of Ethics
- Popular presentation of research and public opinion about research
- Informing the politics about possibilities and challenges of research

Ethics of AI



1. Unemployment
2. Inequality (Distribution of the wealth created by machines)
3. Humanity. (How do machines affect us)(E.g. societies of total control)
4. Artificial stupidity
5. AI bias
6. Security
7. Unintended consequences
8. Robot rights (Not an urgent problem until robots gain consciousness)

Ethics in Autonomous Cars



<https://webcasts.weforum.org/widget/1/china2018?p=1&pi=1&th=1&id=a0W0X00000ClawBUAT&auto=1>

Decision making by algorithms

ETHICAL ISSUES MOVE TECHNOLOGY FORWARD REQUIREMENTS ON AI (V. DIGNUM)

Drawing on former, similar frameworks such as **privacy-by-design** to **value-sensitive design**, putting human values and ethical principles into the core of the design of a system really requires a mind-shift of researchers and developers. **Ethical principles should be embedded in the design of the systems by default.**

1. Human agency and oversight
2. Technical robustness and safety
3. Privacy and data governance
4. Transparency
5. Diversity, non-discrimination and fairness
6. Environmental and societal well-being
7. Accountability

PROFESSIONALS TALK ETHICS CACM August 2018

- INFORMATICS EUROPE AND ACM EUROPE COUNCIL Regulating Automated Decision Making
- CERF'S UP Traceability -workshop on **cybersecurity** was how to preserve the freedom and openness of the Internet while protecting against the harmful behaviors
- LETTERS TO THE EDITOR Encourage ACM to Address U.S. Election Integrity
- In the spirit of Moshe Y. Vardi's call for ACM to ". . . **be more active in addressing social responsibility issues raised by computing technology,**" we urge the ACM U.S. Public Policy Council to undertake a study of the technological ... *CACM Staff*
- BLOG@CACM Assessing Responsibility for Program Output
- **We lack an easy way to indicate that algorithms do not make decisions and are not biased;** programmers do, and are. *Robin K. Hill*
- Animals Teach Robots to Find Their Way
- Navigation research demonstrates bio-machine symbiosis. *Chris Edwards*
- Electronics Are Leaving the Plane Stacking chips and connecting them vertically
- Broadening the Path for Women in STEM - Organizations work to address 'a notable absence of women in the field.' *Esther Shein*
- GLOBAL COMPUTING Designing Sustainable Rural Infrastructure Through the Lens of OpenCellular
- EDUCATION Providing Equitable Access to Computing Education
- Seeking the best measures to reach advantaged and less-advantaged students equally. *Mark Guzdial, Amy Bruckman*
- COLUMN: KODE VICIOUS Every Silver Lining Has a Cloud

POINT/COUNTERPOINT: DEMOCRACY AND E-DEMOCRACY

- Point: **Foundations of E-Democracy**

Considering the possibility of achieving an e-democracy based on long-established foundations that strengthen both real-world democracies and virtual Internet communities. Ehud Shapiro

- Counterpoint: **E-Democracy Won't Save Democracy**. Democracy Will Save Democracy

Increased technology is not the solution to the fundamental issue of declining democratic culture. Douglas Schuler

PRACTICE Algorithms Behind Modern Storage Systems

Different uses for read-optimized B-trees and write-optimized LSM-trees. Alex Petrov

Research for Practice: Prediction-Serving Systems

- **What happens when we wish to actually deploy a machine learning model to production?** Dan Crankshaw, Joseph Gonzalez, Peter Bailis

- Consistently Eventual

- For many data items, the work never settles on a value. Pat Helland

CONTRIBUTED ARTICLES How to Teach Computer Ethics through Science Fiction

- **Science fiction in particular offers students a way to cultivate their capacity for moral imagination.** Emanuelle Burton, Judy Goldsmith, Nicholas Mattei

- Queueing theoretic models can guide design trade-offs in systems targeting tail latency, not just average performance. Christina Delimitrou, Christos Kozyrakis
Pages 65-72 SECTION: REVIEW ARTICLES Multiparty Privacy in Social Media
- Online privacy is not just about what you disclose about yourself, it is also about what others disclose about you. Jose M. Such, Natalia Criado
- SECTION: RESEARCH HIGHLIGHTS Technical Perspective: Graphs, Betweenness Centrality, and the GPU
- "Accelerating GPU Betweenness Centrality" by McLaughlin and Bader
- We present a hybrid GPU implementation that provides good performance on graphs of arbitrary structure rather than just scale-free graphs as was done previously. Adam McLaughlin, David A. Bader
- COLUMN: LAST BYTE Deadlock
- Upgraded with new instructions, my AI aims to debug its original programmer, along with his home planet. William Sims Bainbridge

Why I do not talk about ethical dilemmas

Naming decision situations dilemmas underlines the impossibility to find an ideal (perfect, unique and provable) solution.

However, design and engineering require decision making in the real world where the solution is the best available solution under given circumstances (constraints).

Ethics for Design

ETHICS FOR DESIGN & ETHICS IN DESIGN

12 designers and researchers from 8 European cities discuss the impact of design on our societies and the paths to follow for designers to work for the good of all.

1. What does a designer do?
2. Is there something wrong with design?
3. Ethics and Morality
4. How designers can do better?

Ethics for Design

1. What does a designer do?

- 0:00-4:20 James Auger, M-ITI, Madeira. **Critical Design:** Gravity battery- solar energy lifting mass – storing energy for later use
- 4:20- Alan Findeli, Nimes and Montreal Universities, Project laboratory. "**Inhabitability**"
- 08:27 Peter Bil'ak, Type and graphic designer, Typotheque, The Hague. **Design for all:** magazine by designers for all – affordable, social distribution

Ethics for Design

1. What does a designer do?

- 11:14 **Design for values** – Nicolas Nova, The Near Future Lab Geneva
- 11:43 Geoffrey Dorne, Design & Human, Paris. App for **communication between refugees**
- 13:08 Sarah Gold, IF London – **privacy and security** – The opportunity for design to come in and make a difference

Ethics for Design

2. Is there something wrong with design?

- 15:17
- 17:33-18:51 Sarah Gold:
 - Design not taken seriously
 - Technology moving too quickly
 - Rights we expect to have:
 - The right to be informed
 - The right of access
 - The right to rectification
 - The right to erasure
 - The right to restrict processing
 - The right to data portability
 - The right to object
 - Rights related to automated decisions & profiling

Ethics for Design

3. Ethics and Morality

- 19:24 – 21:09
- 21:09 -21:41 James Williams, doctoral candidate on attention ethics at Oxford University, Time Well Spent. **Ethics as “the world it ought to be”**
- 22:32 – 24:36 Matthieu Cherubi, Design technologist, Shanghai – **machine ethics, car ethics**

Ethics for Design

3. Ethics and Morality

- 27:37 – 28:01 James Williams: Technology helping us achieve our values
- 28:54 – 29:58 Sarah Gold: Beyond technological solipsism – awareness about other people's presence
- 29:58 -31:30 James Williams: Moving towards what we want to move to

Ethics for Design

4. How designers can do better?

- 31:30
- 31:46 -33:00 Matthieu Cherubi, **Designing against your own ethical beliefs and values** – Pizza robot
- 39:23 -40:30 **Window of opportunity**, Sarah Gold
- 41:39 43:44 **Distractions** of design like pollution of environment, James Williams
- 47:27 Juicy salif Lemon squeezer: **vacuous design?**
<https://www.independent.co.uk/property/interiors/the-secret-history-of-philippe-starcks-lemon-squeezer-1972849.html>
- 48:03 – 49:00 **Openness** as a virtue, Sarah Gold
- 49:00 – 49:43 **Care for the user**, James Williams

ETHICS FOR DESIGN(ERS)

Web Resources



<https://usabilitygeek.com/ethics-in-user-experience-design/>



<https://www.ethicsfordesigners.com/articles/>

Ethically Aligned Design & IEEE Standards

Chapters of *Ethically Aligned Design*, First Edition

[Executive Summary](#)

[From Principles to Practice](#)

[General Principles](#)

[Classical Ethics in A/IS](#)

[Well-being](#)

[Affective Computing](#)

[Personal Data and Individual Agency](#)

[Methods to Guide Ethical Research and Design](#)

[A/IS for Sustainable Development](#)

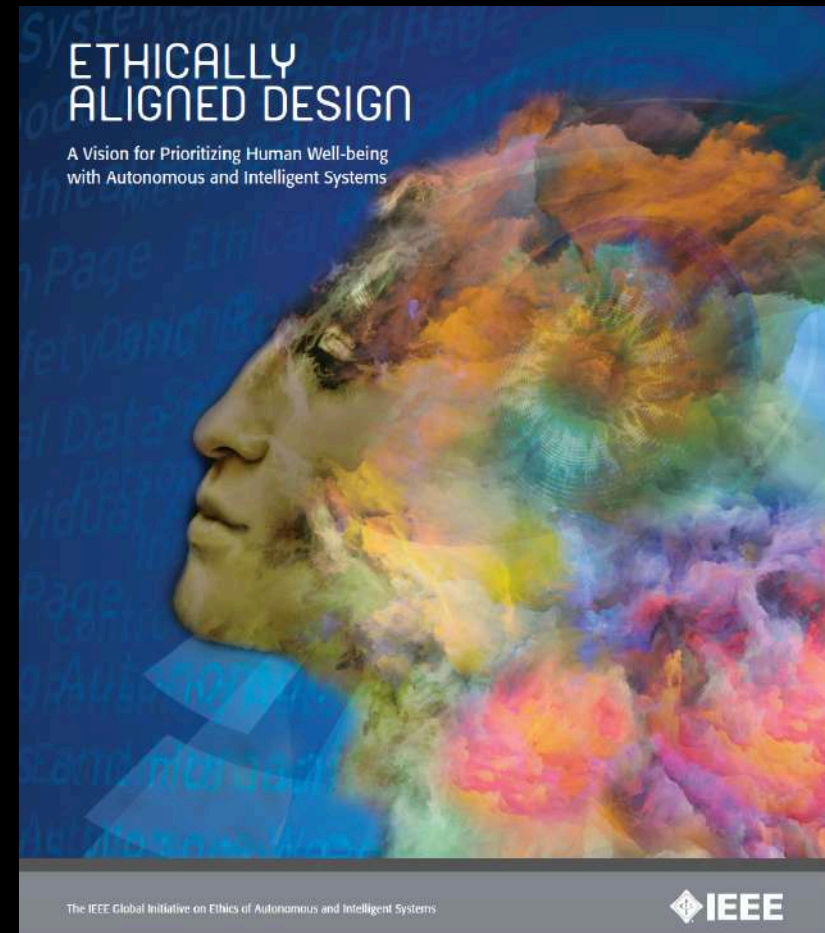
[Embedding Values into Autonomous and Intelligent](#)

[Systems](#)

[Policy](#)

[Law](#)

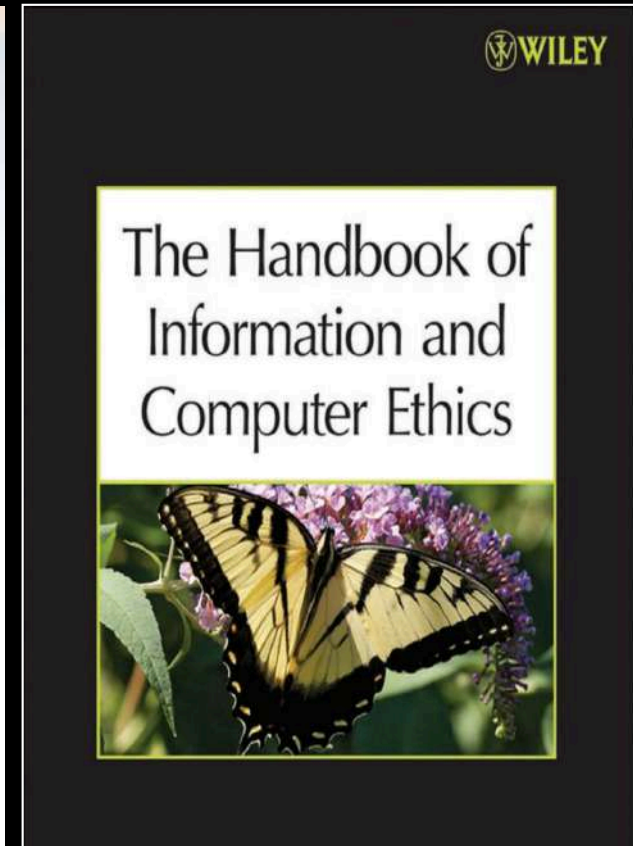
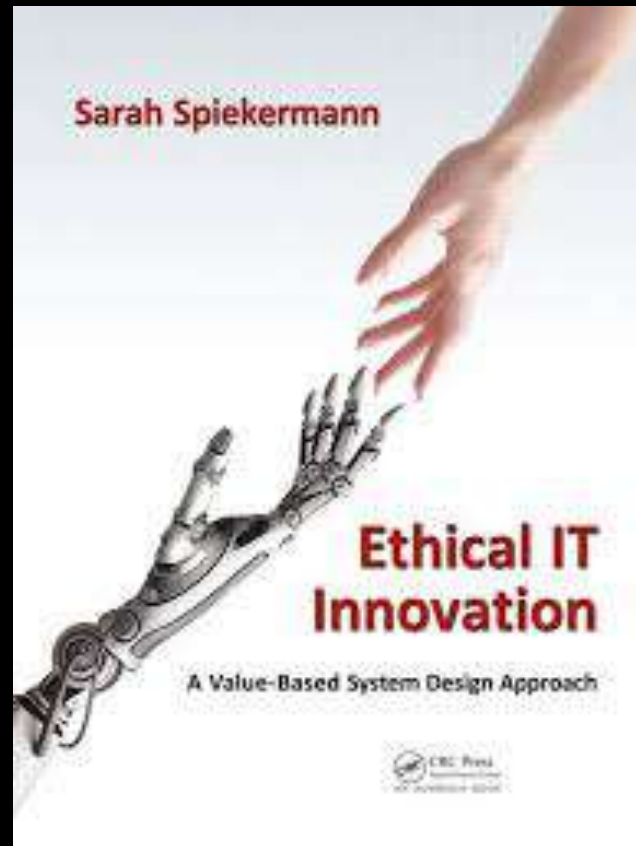
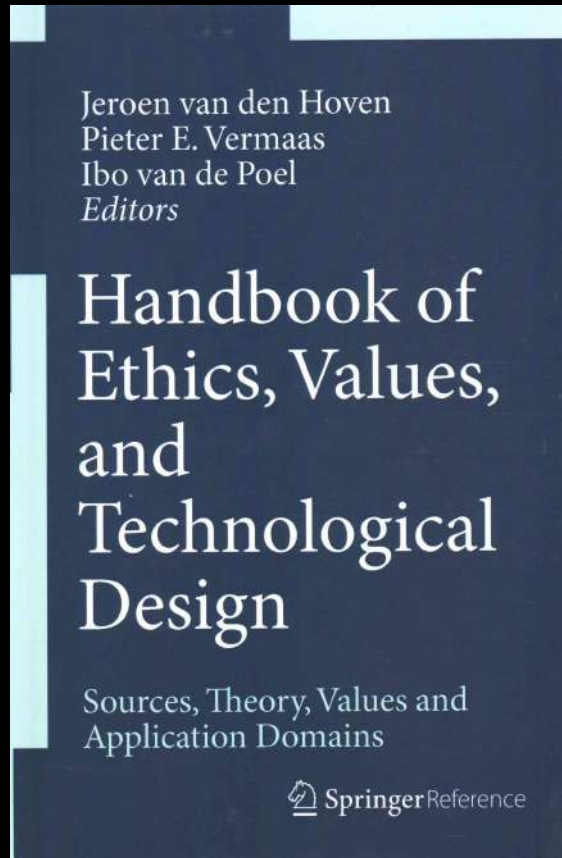
[Extended Reality in A/IS](#)



<https://ethicsinaction.ieee.org/>

A/IS = autonomous and intelligent systems

BOOKS

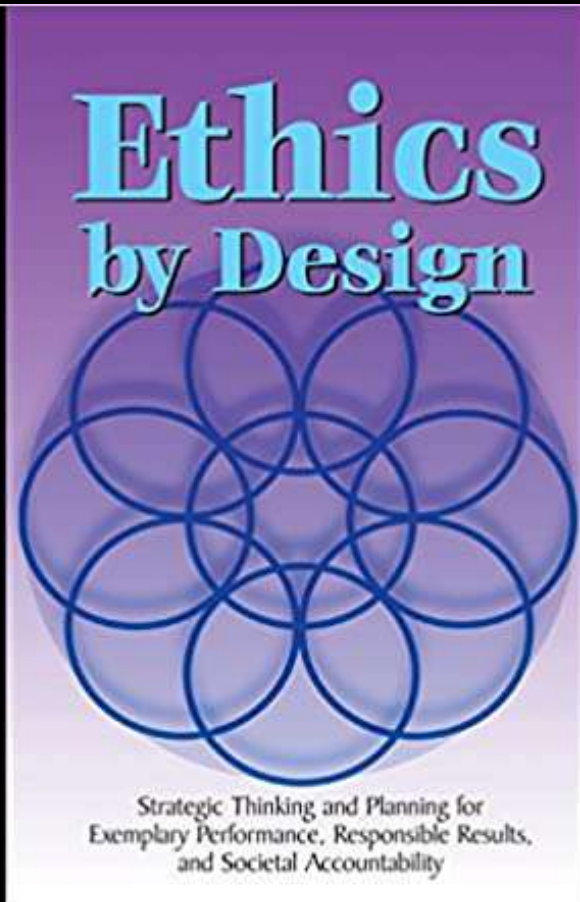


<http://www.springer.com/la/book/9789400769694>

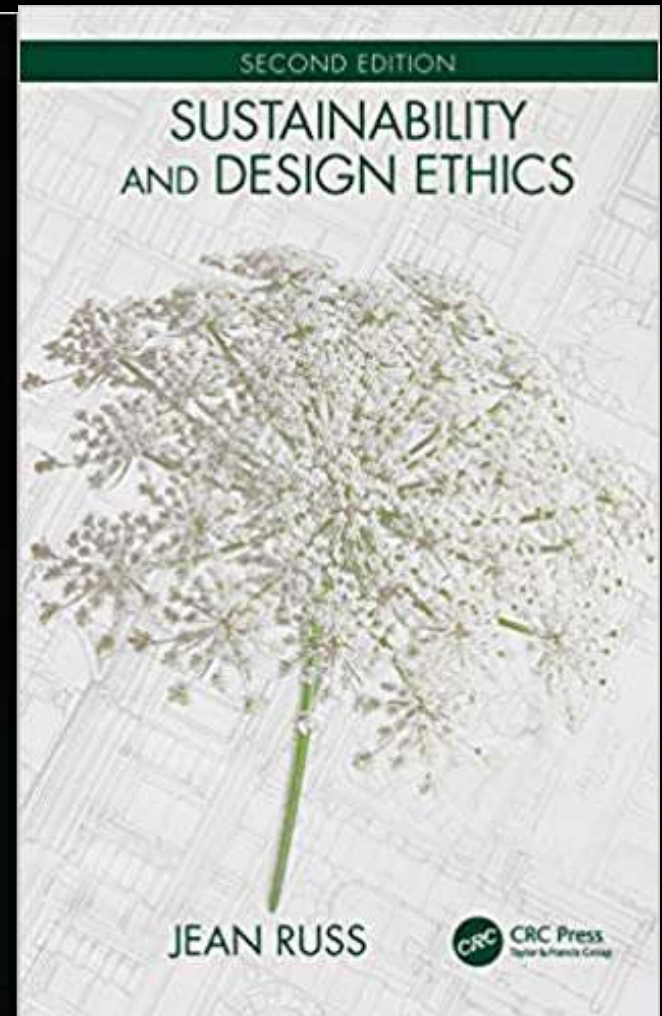
<http://opac.vimaru.edu.vn/edata/EBook/SACH%20TV%20SO%20HOA/English/SDHLT%2003015%20-%20Ethical%20IT%20innovation%20%20a%20value-based%20system%20design%20approach.pdf>

http://www.cems.uwe.ac.uk/~pchatter/2011/pepi/The_Handbook_of_Information_and_Computer_Ethics.pdf

DESIGN ETHICS



Stephanie L. Moore, Ph.D.



Before we end discussing Ethics

Question:

What are the most important ethical questions of emerging technologies?

<https://www.mentimeter.com/>

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