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Prof. Dr. Judith Simon

IT for Good? Ethics in Computer Science Education & Practice

25.10.22 | ECSS 2022 | Universität Hamburg |



Outline

- Ethical Software – Isn't Software Neutral?
- Ethics in IT: Three Perspectives
- Conclusions



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Ethical Software?

Ethical Software?? Isn't technology neutral?



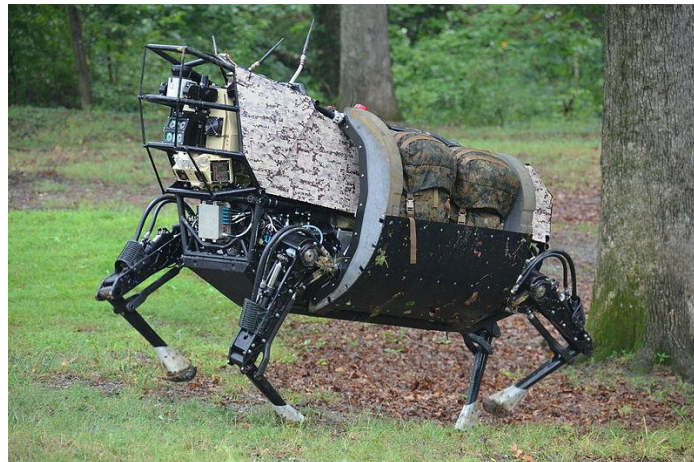
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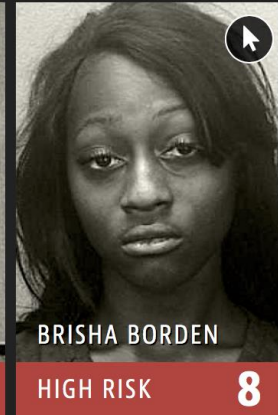
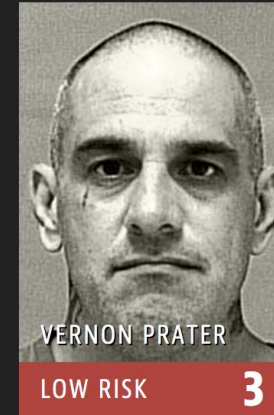
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Isn't technology neutral?



Two Petty Theft Arrests



Borden was rated high risk for future crime after she and a friend took a kid's bike and scooter that were sitting outside. She did not reoffend.



Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

*by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica
May 23, 2016*

Tactical Technology Office, Defense Advanced Research Projects Agency, U.S. Department of Defense
Book Catalog, Flickr, CC BY 2.0

<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>



Isn't technology neutral?

Two Petty Theft Arrests



VERNON PRATER

LOW RISK

3



BRISHA BORDEN

HIGH RISK

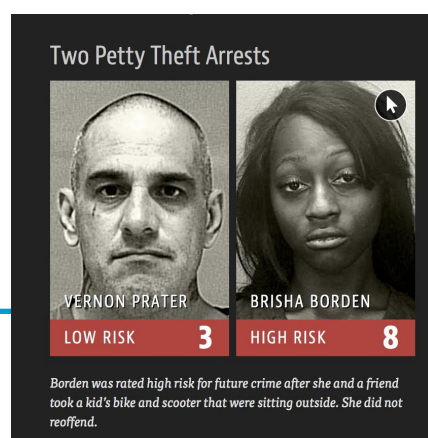
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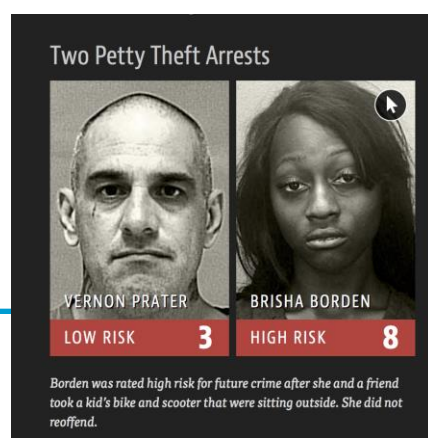
*by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica
May 23, 2016*



Isn't technology neutral?

COMPAS Case: The Justice Problem

- Societal stereotypes and prejudices, but also existing inequalities and injustices are frequently inscribed into technologies.
- Intention possible, but mostly unintentionally through training data or methodological choices
- Especially data-based ADM systems run the risk of cementing the status quo if historical data are used to predict the future
- The issues often cannot be assessed and addressed due to a dual transparency problem



Isn't technology neutral?

COMPAS Case: The Transparency Problem

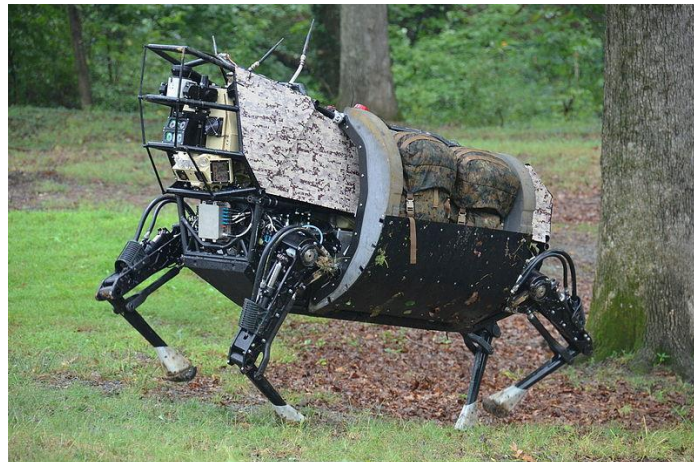
1. Functional opacity: lack of access to proprietary algorithmic systems
2. Epistemic opacity: limited understanding of complex systems



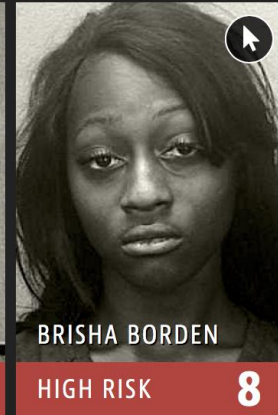
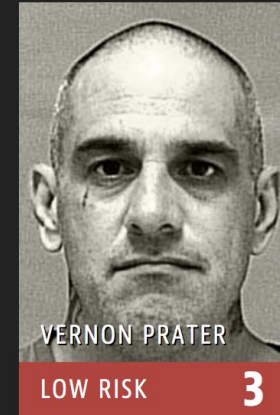
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Isn't technology neutral? No!



Two Petty Theft Arrests



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<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>

- Designing Technology <> Designing Society



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- Agency <> Power <> Responsibility <> Ethics



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Ethics & IT: Three Perspectives



- Ethics
 - What is good/bad? What is right/wrong?
 - What can/should/must we (not) do and for what reasons?



- Ethics
 - What is good/bad? What is right/wrong?
 - What can/should/must we (not) do and for what reasons?
- Ethics and software?
 - What is good/bad software?
 - What can/should/must we (not) do with software and for what reasons?



- Ethics
 - What is good/bad? What is right/wrong?
 - What can/should/must we (not) do and for what reasons?
- Ethics and software?
 - What is good/bad software?
 - What can/should/must we (not) do with software and for what reasons?
- Good software
 - Scientifically and technologically good software is necessary but not sufficient for ethically good software
 - We must also assess objectives - and may sometimes be obliged not to use technologically good software for ethical reasons



Triple Role of Ethics for IT

Ethics of
Profession

Ethics of
Use

Ethics of
Design



Ethics of
Profession



Designer &
Developer



Draper
Laboratory



IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members, and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

I. To uphold the highest standards of integrity, responsible behavior, and ethical conduct in professional activities.

1. to hold paramount, the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, to protect the privacy of others, and to disclose promptly factors that might endanger the public or the environment;
2. to improve the understanding by individuals and society of the capabilities and societal implications of conventional and emerging technologies, including intelligent systems;

II. To treat all persons fairly and with respect, to avoid harassment or discrimination, and to avoid injuring others.

7. to treat all persons fairly and with respect, and to not engage in discrimination based on characteristics such as race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
8. to not engage in harassment of any kind, including sexual harassment or bullying behavior:



Ethics of Profession



Designer & Developer

ETHICAL GUIDELINES OF THE GERMAN INFORMATICS SOCIETY

Bonn, June 25, 2018

5. PREAMBLE

The German Informatics Society (GI) is a registered non-profit organization. With these guidelines, the GI seeks to establish that matters of professional ethics or moral conflicts become the subject of collaborative reflection and action. The guidelines are designed to offer a point of orientation not only to members of the GI association, but to all persons involved in the design, manufacture, operation or use of IT systems.

SECTION 1: PROFESSIONAL COMPETENCE
GI members stay abreast of the current state of science and technology in their respective areas of specialization, they take new developments into account and provide constructive criticism. GI members are constantly working to improve their professional competencies.

SECTION 5: CONDITIONS OF EMPLOYMENT
GI members are active proponents of socially equitable contractual agreements concerning terms of employment, inclusive of opportunities for professional development and shared governance.

SECTION 9: COURAGE OF CONVICTIONS
GI members staunchly advocate for the protection and safeguarding of human dignity, even when this is not explicitly mandated by laws, contracts or other norms, or when these stand in direct opposition to the protection and safeguarding of human dignity. This applies even in situations in which GI members' obligations to clients conflict with their responsibility to third-party stakeholders.

6. The ethical guidelines outlined herein express the intent of GI members to conduct themselves in accordance with the values that form the basis of Basic Law for the Federal Republic of Germany and the Charter of Fundamental Rights of the European Union.

The GI and its members are committed to adhering to these guidelines. They also seek to insure that these guidelines find acknowledgement in public discourse outside the GI. GI members are especially committed to respecting and protecting human dignity, wherever norms of the state, society or the private

SECTION 3: EXPERTISE AND COMMUNICATIVE COMPETENCE
GI members are constantly improving their levels of expertise and communicative competencies in order to meet the demands related to their duties in the design, manufacture, operation and use of IT systems and to understand the surrounding professional and technical contexts. In order to assess the consequences of IT systems in the application environment and to propose suitable solutions, there must be a willingness

SECTION 6: ORGANIZATIONAL STRUCTURES
GI members advocate for organizational structures which foster and facilitate socially equitable contractual agreements concerning terms of employment.

SECTION 10: SOCIAL ACCOUNTABILITY
In the design, manufacture, operation and use of IT systems, GI members should contribute to the betterment of local and global living conditions. GI members are responsible for the social and societal consequences of their work. Their influence on positioning, marketing and further development of IT systems should contribute to the socially acceptable and sustainable application of these technologies.

ACM Code of Ethics and Professional Conduct

ACM Code of Ethics and Professional Conduct

Preamble

Computing professionals' actions change the world. To act responsibly, they should reflect upon the wider impacts of their work, consistently supporting the public good. The ACM Code of Ethics and Professional Conduct ("the Code") expresses the conscience of the profession.

The Code is designed to inspire and guide the ethical conduct of all computing professionals, including current and aspiring practitioners, instructors, students, influencers, and anyone who uses computing technology in an impactful way. Additionally, the Code serves as a basis for remediation when violations occur. The Code includes principles formulated as statements of responsibility, based on the understanding that the public good is always the primary consideration. Each principle is supplemented by guidelines, which provide explanations to assist computing professionals in understanding and applying the principle.

Section 1 outlines fundamental ethical principles that form the basis for the remainder of the Code. Section 2 addresses additional, more specific considerations of professional responsibility. Section 3 guides individuals who have a leadership role, whether in the workplace or in a volunteer professional capacity. Commitment to ethical conduct is required of every ACM member, ACM SIG member, ACM award recipient, and ACM SIG award recipient. Principles involving compliance with the Code are given in Section 4.

The Code as a whole is concerned with how fundamental ethical principles apply to a computing professional's conduct. The Code is not an algorithm for solving ethical problems; rather it serves as a basis for ethical decision-making. When thinking through a particular issue, a computing professional may find that multiple principles should be taken into account, and that different principles will have different relevance to the issue. Questions related to these kinds of issues can best be answered by thoughtful consideration of the fundamental ethical principles, understanding that the public good is the paramount

On This Page

Preamble

1. GENERAL ETHICAL PRINCIPLES.

- 1.1 Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing.
- 1.2 Avoid harm.
- 1.3 Be honest and trustworthy.
- 1.4 Be fair and take action not to discriminate.
- 1.5 Respect the work required to produce new ideas, inventions, creative works, and computing artifacts.
- 1.6 Respect privacy.
- 1.7 Honor confidentiality.

2. PROFESSIONAL RESPONSIBILITIES.

- 2.1 Strive to achieve high quality in both the processes and products of professional work.
- 2.2 Maintain high standards of professional competence, conduct, and ethical practice.



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https://gi.de/fileadmin/GI/user_upload/GI_Poster_Ethical_Guidelines.pdf

<https://www.ieee.org/content/dam/ieee-org/ieee/web/org/about/corporate/ieee-code-of-ethics.pdf>

<https://www.acm.org/binaries/content/assets/about/acm-code-of-ethics-booklet.pdf>

Ethics of
Use



Users &
Usage



Should individuals be allowed to post racist comments online? What should I do?

Ethics of Use



Users & Usage



SplitShire, pixabay, CC0

For what purposes should a company use customer data?

Should public administration use algorithmic decision support systems? What is the adequate level of quality?



Ethics of
Design



Tech/IT-
Artefacts



Task 1: Ethical analysis of existing technologies

Task 2: Ethical design of new technologies

Ethics of Design



Tech/IT-Artefacts





Task 1: Ethical analysis of existing technologies

„Computer ethics should not just study ethical issues in the use of computer technology, but also in the technology itself.“

(Brey 2010:42)

Task 1: Ethical analysis of existing technologies

„Computer ethics should not just study ethical issues in the use of computer technology, but also in the technology itself.“

(...) computer systems and software are not morally neutral and (...) it is possible to identify tendencies in them to promote or demote particular moral values and norms.“

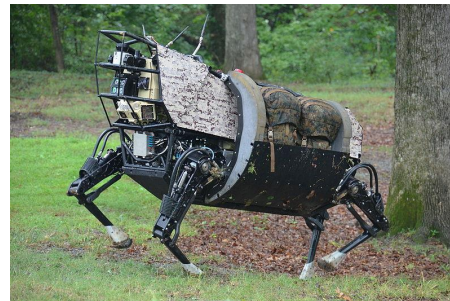
(Brey 2010:42)



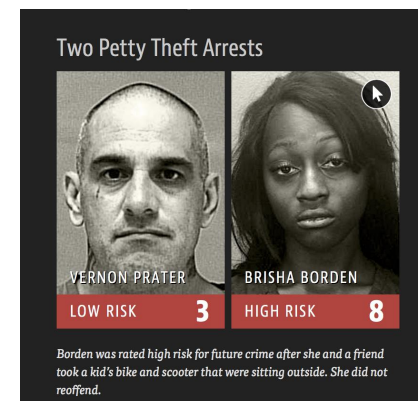
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Task 2: Ethical design of new technologies

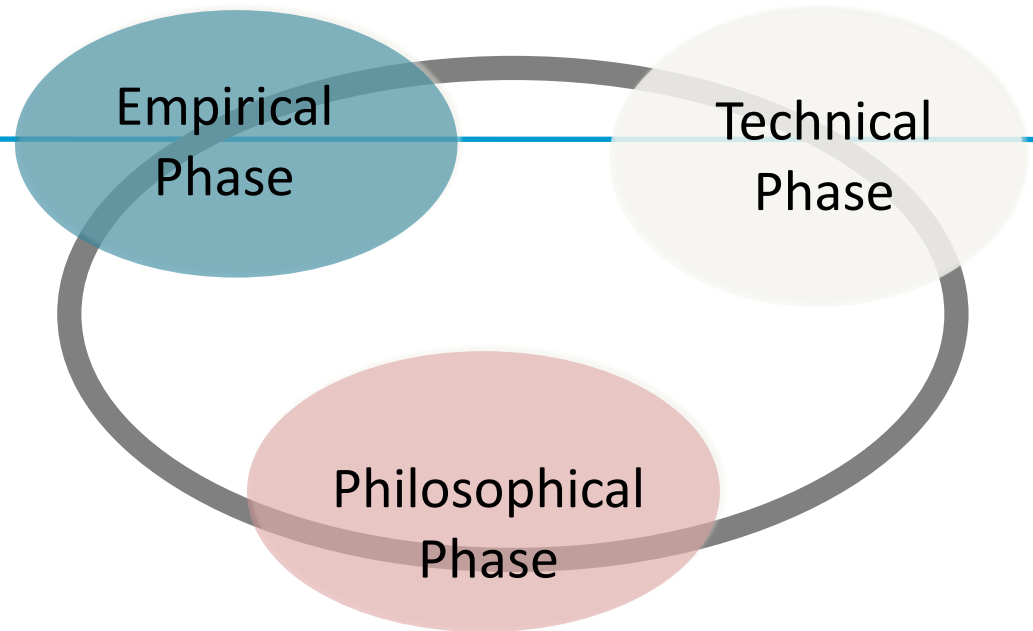
→ Values in Design: Accounting for values in design & development



Task 2: Ethical design of new technologies

→ Values in Design: Accounting for values in design & development

„If an ideal world is one in which technologies promote not only instrumental values such as functional efficiency, safety, reliability and ease of use, but also substantive social, moral and political values to which societies and their people subscribe, then those who design systems have a responsibility to take this latter values as well as the former into consideration as they work.“ (Flanagan et al. 2008:322)



Task 2: Ethical design of new technologies

→ **Values in Design/Value-Sensitive Design:** Accounting for values, such as **privacy, transparency or fairness** in design & development

Fairness, Accountability and Transparency?



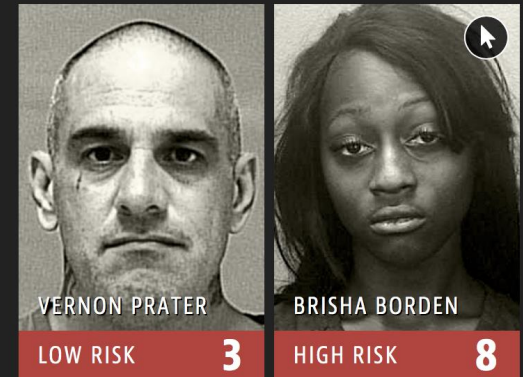
ACM FAcCT is the new acronym for the ACM Conference on Fairness, Accountability, and Transparency!

ACM FAcCT will be held online March 3-10, 2021. More information on this year's conference is posted on the [2021 ACM FAcCT webpage](#).

Algorithmic systems are being adopted in a growing number of contexts, fueled by big data. These systems filter, sort, score, recommend, personalize, and otherwise shape human experience, increasingly making or informing decisions with major impact on access to, e.g., credit, insurance, healthcare, parole, social security, and immigration. Although these systems may bring myriad benefits, they also contain inherent risks, such as codifying and entrenching biases; reducing accountability, and hindering due process; they also increase the information asymmetry between individuals whose data feed into these systems and big players capable of inferring potentially relevant information.

ACM FAcCT is an interdisciplinary conference dedicated to bringing together a diverse community of scholars from computer science, law, social sciences, and humanities to investigate and tackle issues in this emerging area. Research challenges are not limited to technological solutions regarding potential bias, but include the question of whether decisions should be outsourced to data- and code-driven computing systems. We particularly seek to evaluate technical solutions with respect to existing problems, reflecting upon their benefits and risks; to address pivotal questions about economic incentive structures, perverse implications, distribution of power, and redistribution of welfare; and to ground research on fairness, accountability, and transparency in existing legal requirements.

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Conclusions

Triple Role of Ethics for IT

Ethics of
Profession



Designer &
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Draper
Laboratory

Ethics of
Use



Users &
Usage



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Ethics of
Design



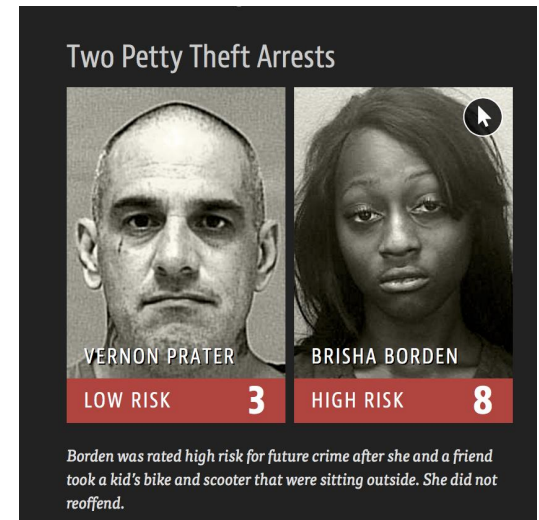
Tech/IT-
Artefacts



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Triple Role of Ethics for IT





Ethical reflection, tech development and participation

- There are different methods to detect/measure and to prevent/minimize discrimination – and they cannot be all satisfied at once!

Ethical reflection, tech development and participation

- There are different methods to detect/measure and to prevent/minimize discrimination – and they cannot be all satisfied at once!
- There are also different accounts and measures of fairness requiring choice and justification
 - Which measures of fairness are most appropriate in a given context?
 - Which variables are legitimate grounds for differential treatment, and why?
 - Should fairness consist of ensuring everyone has an equal probability of obtaining some benefit, or should we aim instead to minimise the harms to the least advantaged?

Ethical reflection, tech development and participation

- Focus on methods within computer science (re. data preparation, model-learning und post-processing etc.) necessary, but not sufficient for ethical software
- Ethics can provide sources for reflections on fairness and justice and may guide appropriate, context-dependent methodological choices > need for ethics in IT
- But: As such choices aren't merely technical, they should not be placed on the shoulders of developers alone
- Rather: they require both technological and ethical expertise – and depending on the impact also broader public debate and participation



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Thank you for your kind attention!

Prof. Dr. Judith Simon

Professor for Ethics in Information Technologies

Universität Hamburg

<http://uhh.de/inf-eit>