

UNIVERSITY OF TWENTE.

MOD6/HCI: VALUE-SENSITIVE DESIGN

PART I: WHAT ARE VALUES?

M. BIRNA VAN RIEMSDIJK



VALUE-SENSITIVE DESIGN (VSD)

DEFINITION

Value-sensitive design
“provides theory, method, and practice to **account for human values** in a principled and systematic manner throughout the technical design process.”
[Friedman, Hendry, 2019]

PROF. BATYA FRIEDMAN



WHAT ARE VALUES?

VALUE DEFINITIONS

- “the importance or **worth** of something to someone”
(Cambridge Dictionary)
- “what a person or group of people consider **important in life**”
[Friedman et al.]
- “deeply rooted, **abstract motivations** that guide, justify or explain attitudes, norms, opinions and actions” [Schwartz, ESS]

Some examples: self-direction, friendship, comfort, achievement, privacy, freedom from bias, sustainability, ...

VALUES TRANSCEND SITUATIONS AND ACTIONS

- Concrete preference: I like photographing architecture.
- Abstract values: a world of beauty, delight

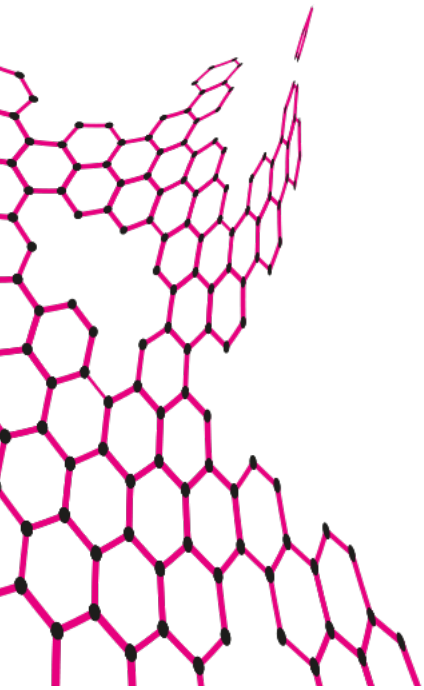
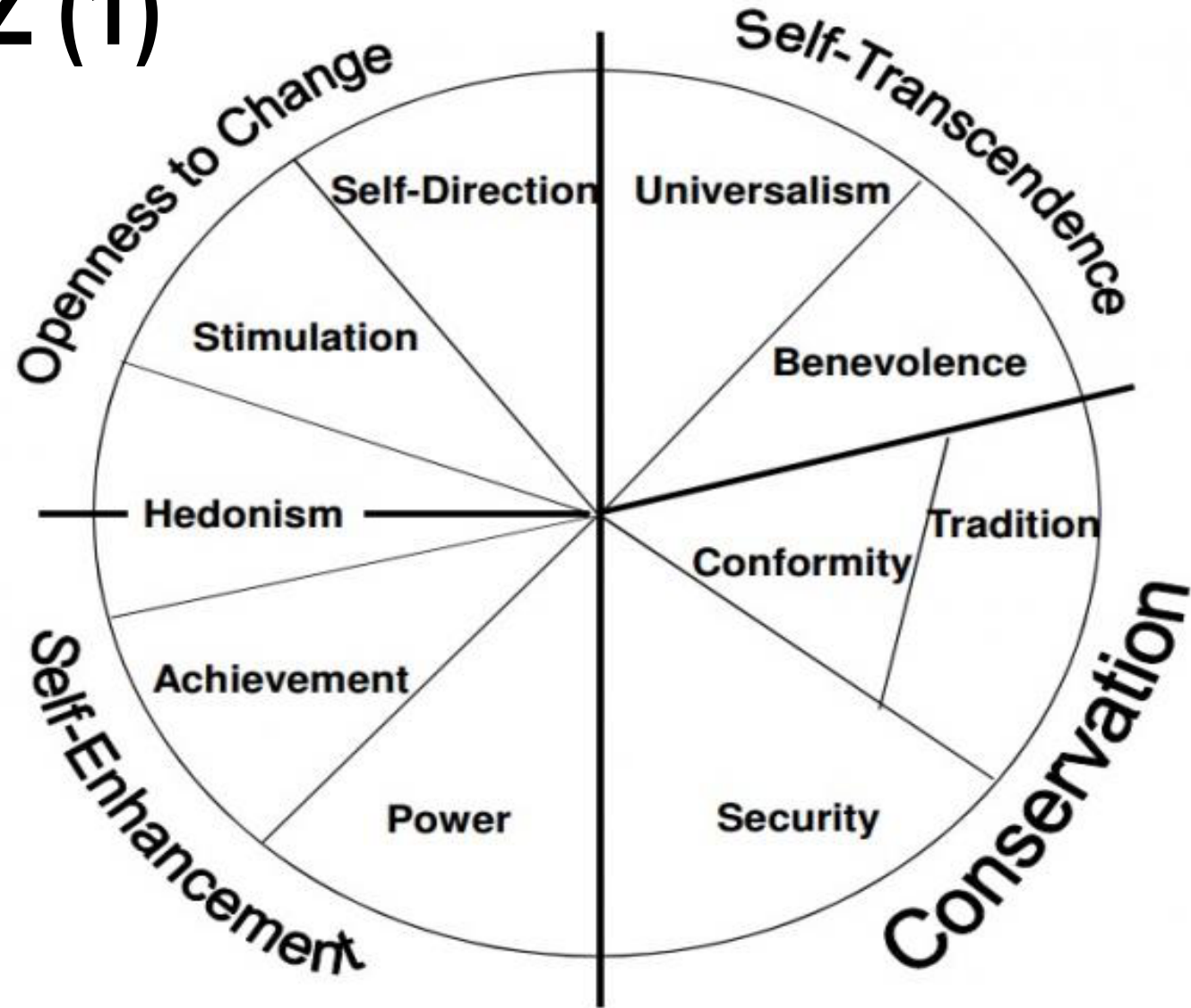


NO EXHAUSTIVE LIST OF VALUES

SEVERAL EXISTING FRAMEWORKS AND LISTS

- **Rokeach** (1973): list of 18 terminal and 18 instrumental values
- **Schwartz** (1992): 10 basic universal motivational values
- **Friedman** et al. (2006): 13 values connected specifically with information technologies

SCHWARTZ (1)



- Schwartz, S. H. (2012). An Overview of the Schwartz Theory of Basic Values. Online Readings in Psychology and Culture, 2(1).



SCHWARTZ (2)

- Validated **survey** with 21 questions that map to the 10 basic values, e.g.,:
 - UNIVERSALISM: “S/he thinks it is important that every person in the world should be treated equally. S/he believes everyone should have equal opportunities in life.”
 - ACHIEVEMENT: “Being very successful is important to him/her. S/he hopes people will recognise his/her achievements.”
- Values **recognized across cultures** with similar priorities (benevolence, universalism, self-direction most important), but their **priorities** differ per individual

ROKEACH

TERMINAL VALUES

- True Friendship
- Mature Love
- Self-Respect
- Happiness
- Inner Harmony
- Equality
- Freedom
- Pleasure
- Social Recognition
- ...

INSTRUMENTAL VALUES

- Cheerfulness
- Ambition
- Love
- Cleanliness
- Self-Control
- Capability
- Courage
- Politeness
- Honesty
- ...

Survey: rank values by importance

ROKEACH VS. SCHWARTZ

- Rokeach's value survey was developed before Schwartz
- **Some overlap** between Rokeach and Schwarz, e.g.,:
 - self-control, freedom self-direction
 - an exciting life stimulation
 - a sense of accomplishment achievement
 - family/national security security
- Rokeach' list also has many **instrumental** ("less basic") **values** describing behaviour, e.g., cheerfulness, cleanliness, honesty
- Schwartz values presented on a **continuum** with opposing values on opposite sides

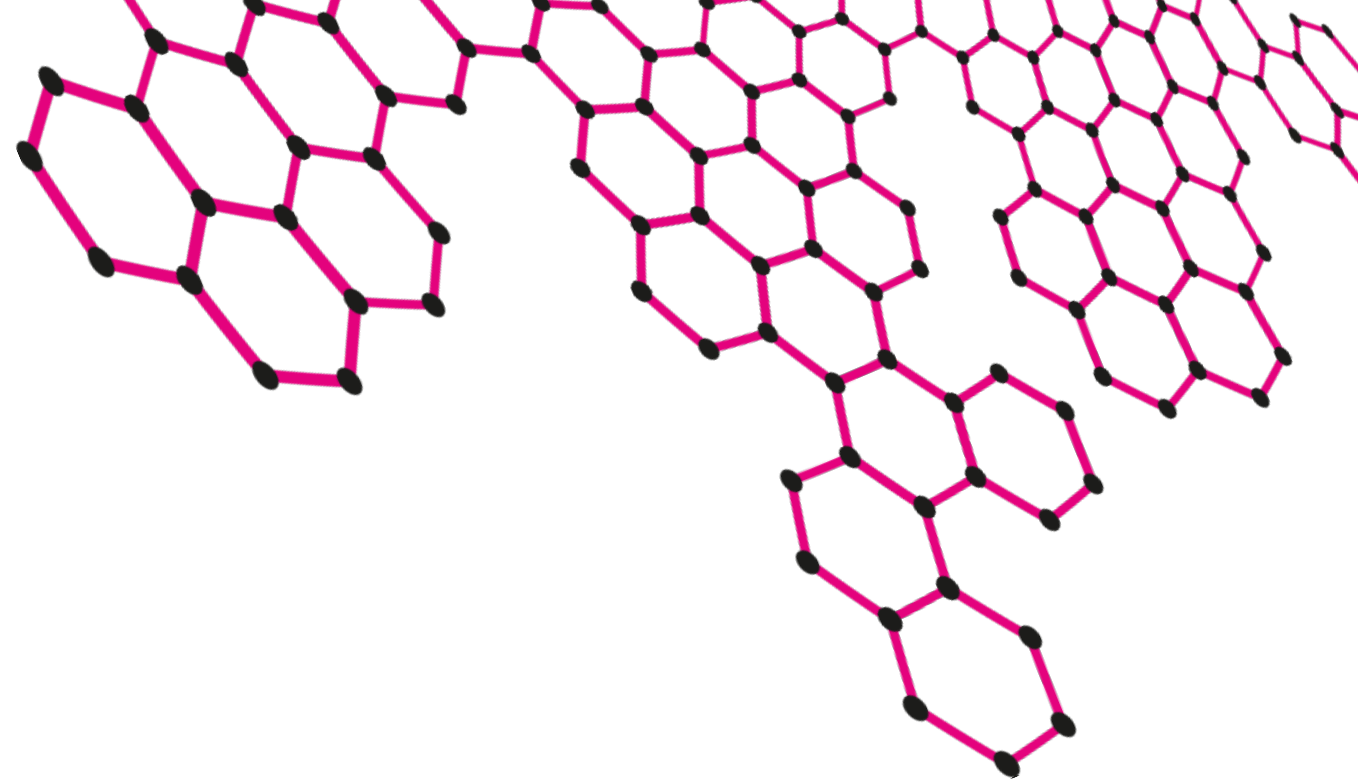
FRIEDMAN ET AL. (1)

- Values (with ethical import) often implicated in information technologies design, from many studies since the 90s:
 - human welfare
 - ownership & property
 - privacy
 - freedom from bias
 - universal usability
 - trust
 - autonomy
 - informed consent
 - accountability
 - courtesy
 - identity
 - calmness
 - environmental sustainability

Friedman B., Kahn P.H., Borning A., Huldtgren A. (2013) Value Sensitive Design and Information Systems. In: Doorn N., Schuurbiens D., van de Poel I., Gorman M. (eds) Early engagement and new technologies: Opening up the laboratory. Philosophy of Engineering and Technology, vol 16. Springer, Dordrecht.

FRIEDMAN ET AL. (2)

- Freedom from bias
 - Refers to **systematic unfairness** perpetrated on individuals or groups, including pre-existing social bias, technical bias, and emergent social bias
- Autonomy
 - Refers to people's ability to decide, plan, and act in ways that they believe will **help them to achieve their goal**
- Accountability
 - Refers to the properties that ensures that the actions of a person, people, or institution may be **traced** uniquely to the person, people, or institution



MOD6/HCI: Value-sensitive Design

PART II: WHY VALUE-SENSITIVE DESIGN?

M. BIRNA VAN RIEMSDIJK

12 NOVEMBER 2020

Greater **impact** of information technologies on our lives:
with greater impact comes greater responsibility

AUTOMATED PREDICTION OF TEST SCORES

<https://www.newstatesman.com/politics/education/2020/08/top-level-grades-soar-private-schools-sixth-form-colleges-lose-out>



Deb Raji
@rajiinio

This is actually unbelievable. In the UK, students couldn't take A-level exams due to the pandemic, so scores were automatically determined by an algorithm.

As a result, most of the As this year - way more than usual - were given to students at private/independent schools. 🙄



GENDER SHADES (2018)

Intersectional Accuracy Disparities in Commercial Gender Classification

JOY BUOLAMWINI (MIT)





















TIMNIT GEBRU (MICROSOFT RES.)



GENDER CLASSIFICATION BASED ON IMAGES

CLASSIFIERS PERFORM WORSE ON DARK/FEMALES

| Gender Classifier | Darker Male | Darker Female | Lighter Male | Lighter Female | Largest Gap |
|---|--|---|--|--|--|
|  Microsoft | 94.0%  | 79.2%  | 100%  | 98.3%  | 20.8%  |
|  FACE++ | 99.3%  | 65.5%  | 99.2%  | 94.0%  | 33.8%  |
|  IBM | 88.0%  | 65.3%  | 99.7%  | 92.9%  | 34.4%  |

BIASES IN FACIAL RECOGNITION

<https://venturebeat.com/2020/09/29/examsofts-remote-bar-exam-sparks-privacy-and-facial-recognition-concerns/>



Dare Obasanjo
@Carnage4Life

Black law student has to shine light in her face for the entirety of bar exam because cheat monitoring software, ExamSoft's, facial recognition algorithm can't recognize Black faces.

CoronaMelder is being tested in the field

Coronavirus is still around and we need to stay alert, especially right now. The CoronaMelder app can help us all to do this. It is currently being trialled in several regions.



Accounting for values can broaden our perspective



Indirect Stakeholders

From: Envisioning Cards
by Batya Friedman, Lisa Nathan, Shaun Kane, and John Lin

PERSONALIZED RECOMMENDATION

BUSINESS GOALS VERSUS USER VALUES?

- VV (Video View): average video viewed by each user
- TS (**Time Spent**): average time that each user spends on the platform
- ID (Impression Depth) average impression through one session
- CTR (**Click-Through-Rate**) the percentage of user clicking on the recommended video

| | VV | TS | ID | CTR | Unexpectedness | Coverage |
|-------------|---------|---------|---------|---------|----------------|----------|
| Improvement | +3.74%* | +4.63%* | +4.13%* | +0.80%* | +9.74%* | +1.23%* |

Table 4: Unexpected recommendation performance in online A/B test: performance increase compared to the current model. “*” represents statistical significance at the 0.95 level.

Li, Pan and Que, Maofei and Jiang, Zhichao and HU, YAO and Tuzhilin, Alexander (2020)
PURS: Personalized Unexpected Recommender System for Improving User Satisfaction.
In: Fourteenth ACM Conference on Recommender Systems. ACM.

Accounting for interconnections between technology – user – society

TECHNOLOGY IS JUST A TOOL?

<https://www.rijksoverheid.nl/documenten/rapporten/2020/07/14/ethische-analyse-van-de-covid-19-notificatie-app-ter-aanvulling-op-bron-en-contactonderzoek-ggd>

The **embodied** position

“Designers inscribe their own intentions and values into the technology.” [Friedman and Kahn, 2003]

Ethical analysis of COVID-19 notification app by expert panel

- Privacy
- Inclusion
- Effectiveness
- ...

Societal values taken into account by designers!

TECHNOLOGY IS JUST A TOOL?

The **interactional** position

“The technology’s actual use depends on the goals of the people interacting with it.” [Friedman and Kahn, 2003]

Technology is neither good nor bad; nor is it neutral. [Kranzberg, 1986]



TECHNOLOGY IS JUST A TOOL?

<https://www.rijksoverheid.nl/documenten/rapporten/2020/07/14/ethische-analyse-van-de-covid-19-notificatie-app-ter-aanvulling-op-bron-en-contactonderzoek-ggd>

The **exogeneous** position

“Societal forces significantly shape how a technology will be used.”
[Friedman and Kahn, 2003]

Ethical analysis of COVID-19 notification app by expert panel

- **Voluntariness**

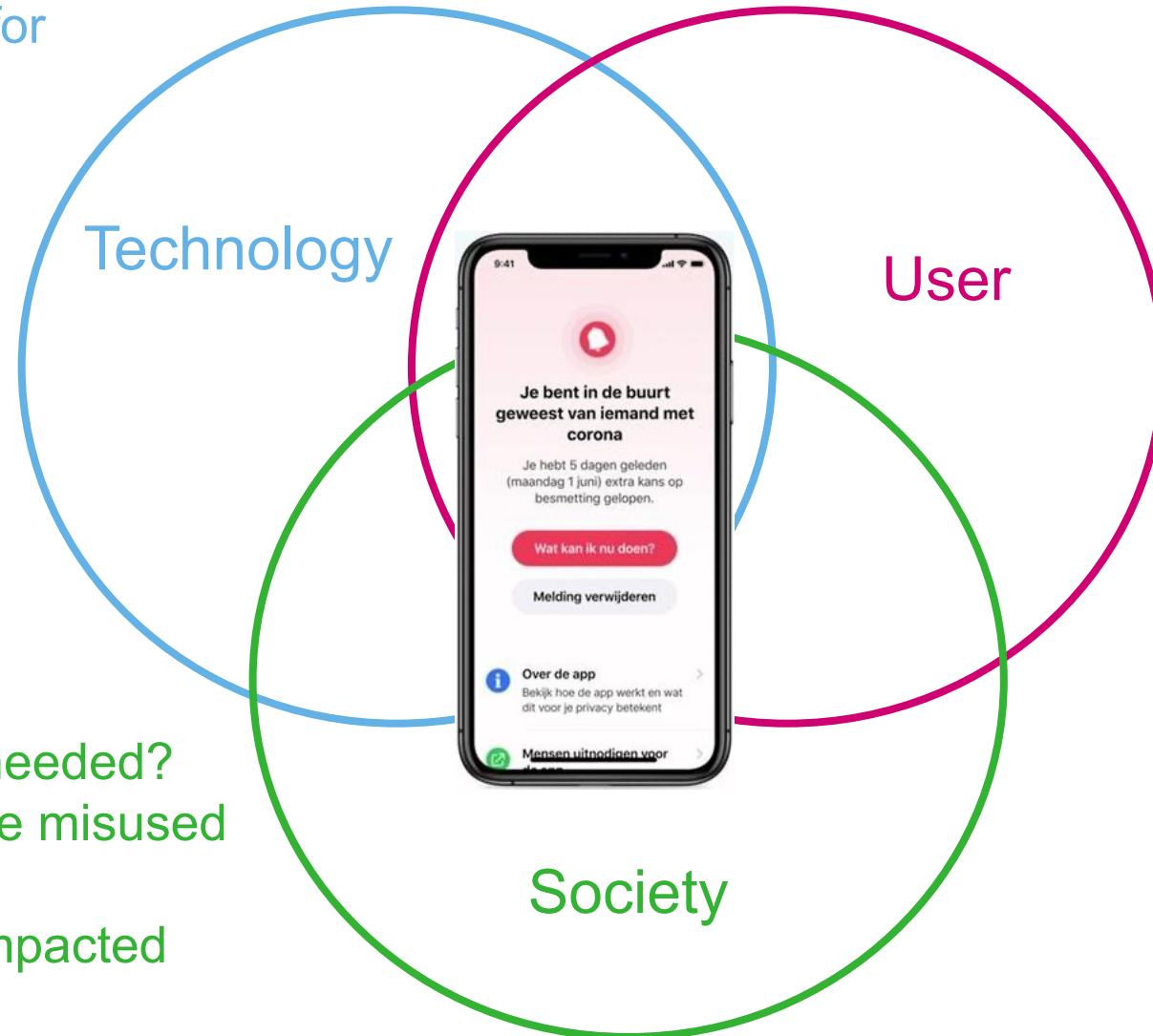
App allows users to **remove notifications** of potential infection: prevents e.g., employer from using this information.

- **Ensure citizen freedom**

Laws and regulation should specify that the app can **only be used for COVID-19** notification in order to prevent spread of the virus.

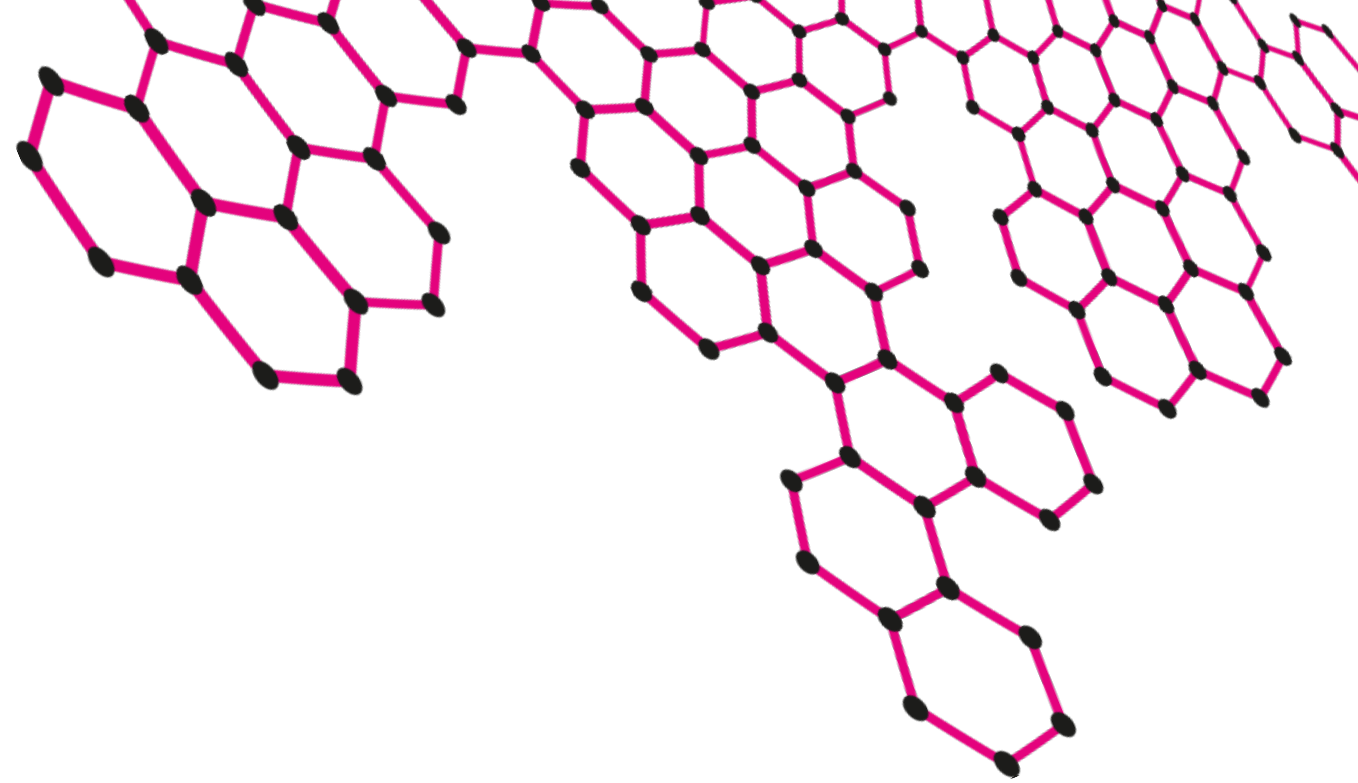
Impact of technology depends on interplay

- Does Bluetooth work for detecting proximity?
- How to ensure data security & privacy?
- How to make the app accessible?



- How many people will install the app?
- Will people take a test and quarantine?
- How to explain the workings of the app?

- Which regulation is needed?
- How could the app be misused by organisations?
- Are certain groups impacted negatively?



MOD6/HCI: Value-sensitive Design

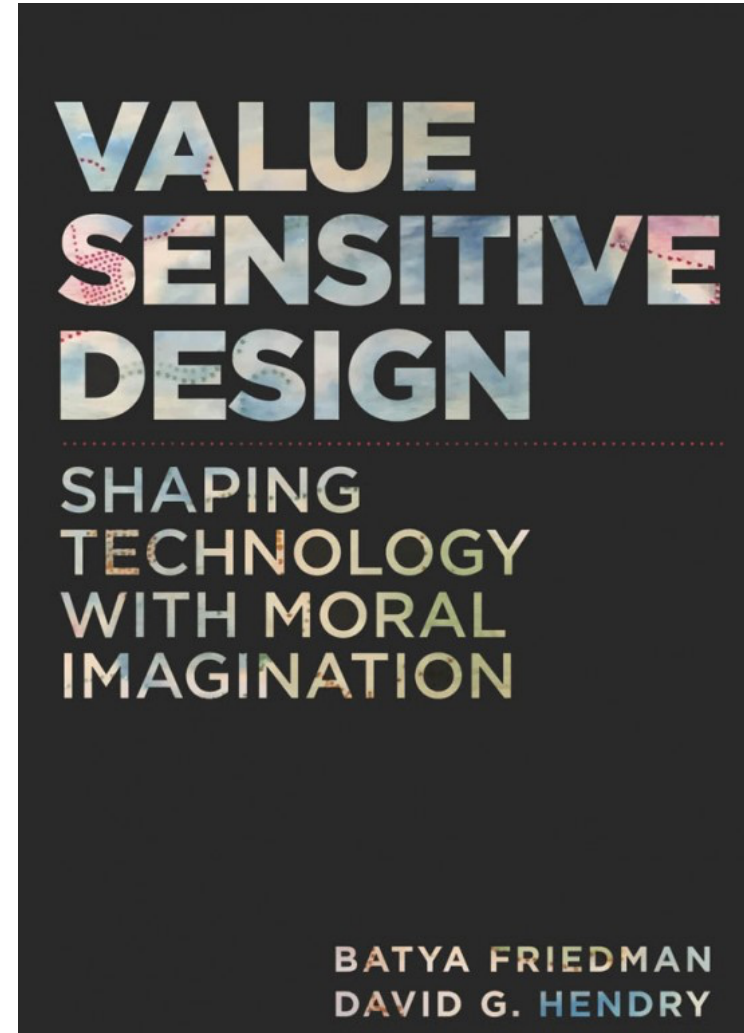
PART III: WHAT IS VALUE-SENSITIVE DESIGN?

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VALUE-SENSITIVE DESIGN (VSD)

Value-sensitive design “provides theory, method, and practice to **account for human values in a principled and systematic manner** throughout the technical design process.” [Friedman, Hendry, 2019]

Under development **since 90s** by prof. Batya Friedman et al., building on work in computer ethics, computer supported cooperative work, social informatics, participatory design.



SOME CHARACTERISTICS OF VSD

- VSD is used **in concert with** other (HCI) design approaches, not instead of
- VSD is not a single methodology but comprises a theoretical framework with **a collection of methods** that can be selected depending on the design context and needs
 - this course: use of a small number of these methods
- VSD is principally concerned with values that deal with human welfare and justice: **moral values**
 - however with recognition of social and personal values: “human values”
- **Whose** values?
 - designer, stakeholders, society



TRIPARTITE METHODOLOGY

- **Conceptual** investigations

- direct and indirect stakeholders
- value definition
- value tensions

- **Empirical** investigations

- investigation of human context using qualitative/quantitative methods from social science/HCI
- evaluate success of design

- **Technical** investigations

- existing tech supporting or hindering values
- system design to ensure support of values

METHODOLOGICAL STRATEGIES

1. Start With a Value, Technology, or Context of Use
2. Identify Direct and Indirect Stakeholders: whose values?
3. Identify Benefits and Harms for Each Stakeholder Group
4. Map Benefits and Harms onto Corresponding Values
5. Develop Working Definitions of Key Values
6. Identify Potential Value Tensions
7. Evaluate User Experience of Values

VALUE TENSIONS

- Values from the same or different stakeholders can be in opposition, e.g., privacy vs. safety
- Addressing (potential) value tensions:
 - bring value tensions to **light**
 - **prioritize** values and focus on most important ones
 - find design solutions that find a **trade-off**
 - find design resolutions that **creatively mitigate** the tension, accounting as much as possible for many important values
 - pause
 - decide not to build the technology

ENVISIONING CARDS (1)

[HTTP://WWW.ENVISIONINGCARDS.COM](http://www.envisioningcards.com)



Changing Hands

Stakeholders · Time · Values · Pervasiveness

Changing Hands

A single product can change hands once, twice, or more times during its lifecycle. It may be passed among family members (e.g., coming of age gift) or across town (e.g., consignment). How might use of the system change as the technology changes hands?

Design a scenario of your product changing hands. Imagine a specific challenge an individual might face when wanting to shift ownership. What features might make this process smoother?

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Design

ENVISIONING CARDS (2)

- 32 cards
- Evocative image & design activity
- Four envisioning criteria: **stakeholders, time, values, pervasiveness**
- This course:
 - Stakeholders: Direct & Indirect
 - Pervasiveness: Widespread use
 - Values: Consider key values at state, Choose desired values, Value tensions, Evaluate user experience of values