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Delft University of Technology
Ethics and Technology

ETHICS OF BLOCKCHAIN
1. HOW TO DO ETHICS OF BLOCKCHAIN?
<table>
<thead>
<tr>
<th>New Technology...Ethics</th>
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<tbody>
<tr>
<td>AI</td>
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<tr>
<td>Deep Learning</td>
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<tr>
<td>Robotics</td>
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<td>Big Data</td>
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<tr>
<td>Quantum Computing</td>
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<tr>
<td>Cloud Computing</td>
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<td><strong>Block chain</strong></td>
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<tr>
<td>Internet of Things</td>
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<td>Social media and On-line platforms</td>
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<td>3D Printing</td>
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<td>5G</td>
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<tr>
<td>Privacy</td>
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<tr>
<td>Accountability</td>
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<tr>
<td>Democracy</td>
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<tr>
<td>Property</td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Safety</td>
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<tr>
<td>Security</td>
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<tr>
<td>Sustainability</td>
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<tr>
<td>Human dignity</td>
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<tr>
<td>Identity</td>
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<td>Social cohesion</td>
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</tbody>
</table>
Confusion

- Cyber
- Net
- E-
- Artificial
- Virtual
- Internet
- Digital
- Online
- Blockchain

- Community
- Friendship
- Person
- Intelligence
- Property
- Crime
- Democracy
- Education
- Organization
Vacuum

- “Cyber community”: a sort of community
- “Digital Democracy”: a sort of democracy
- “Blockchain organisation”: a sort of organisation

- Conceptual Vacuum
- Policy Vacuum
- Design Vacuum
“Interpretative Flexibility”

- New Technologies (e.g. AR, VR, Blockchain) have different meaning, significance and purpose to different groups of people

Bicycle Technology
Interpretative Flexibility

- Rival conceptions of what is a Bicycle is (for) X,Y,Z
Macho, excercise
Convenience, inclusion
Alan Curtis Kay (1940) American computer scientist best known for his pioneering work on object-oriented programming and windowing graphical user interface design.

The best way to predict the future is to invent it.

(Alan Kay)
..to responsibly design it....

Cambridge UP, 2017
“WE SHAPE OUR BUILDINGS; THEREAFTER THEY SHAPE US.”

WINSTON CHURCHILL

© Lifehack Quotes
We shape our institutions and thereafter they shape us: we become like the things we make.
Values Built into (information) Systems

- Interfaces
- Infrastructures
- Algorithms
- Ontologies
- Code
- Protocols
- Integrity constraints
- Architectures
- Governance arrangements
- Identity Management Systems
- Authorization Matrix
- Procedures
- Regulations
- Incentive structures
- Auction mechanisms
- Voting mechanism
- Monitoring and inspection
Design for Addiction
Filter Bubbles

Likes
Recommender Systems
Customization
Daily Me
Design for X

- Design for privacy
- Design for security
- Design for inclusion
- Design for sustainability
- Design for democracy
- Design for safety
- Design for transparency
- Design for accountability
- Design for responsibility
Key Problem
21st Century: Value Sensitive Design
Values hierarchy

- Values
- Norms
- Policies
- Mechanisms
- Protocols
- Design requirements

High Level supra-functional requirements
Example of values hierarchy

Values

Norms

Design requirements

Privacy

Risk mitigation

Accountability

Data quality

Security

Coarse graining

Data clustering

Pseudonymization
2. WHICH MORAL CONCERNS?
Moral issues

- Key crunching markets
- DDOS markets
- Assassination markets
- Weapons trade
- Child porn
- ........
Ethical concerns

- Unethical behaviour supported and enhanced
- Reliability
- Safety
- Security
- Accountability
- Sustainability
- Privacy
- Dual use issues
Application opportunities

- Blockchain for good
  - Land titles
  - Supply chains
  - Electronic patient records
  - Humanitarian aid
  - Identity documents
  - Emission rights
  - Circular economy
  - Book keeping on externalities
Because Blockchain can provide

- Anonymity
- Transparency
- Persistence
- Unalterability
- Decentralization
- Strong encryption
- Affordability
- Accountability
- Reliability
First question

- It all sounds very nice, but are we going to solve our problems in these domains by means of Blockchain technology?

- And are we confident that we are not creating formidable new problems and/or exacerbating old ones?

- How can we know?
Trying to design to have the moral advantages without the moral disadvantages

INNOVATE RESPONSIBLY WITH BLOCKCHAIN
Ethical Fairphone

'Ethical' Fairphone 2 smartphone launched to combat electronic waste

The Fairphone 2 aims to challenge the "throwaway" nature of consumer electronics and ever-shorter product cycles.
RESPONSIBLE INNOVATION WITH BLOCKCHAIN:

DESIGN OF NEW FUNCTIONALITY THAT ALLOWS US TO EXPAND THE SET OF MORAL OBLIGATIONS THAT WE CAN SATISFY
INNOVATION WITH BLOCKCHAIN
IS RESPONSIBLE INNOVATION;
OR IT IS NOTHING
AUGUR

- Ethereum based prediction market
- Draws upon Wisdom of the crowds and crowd sourced epistemics
- Gambling or useful social mechanism?
- Are these mechanism and institutions worthwhile wanting?
- And if so how designed?
3. THE BIGGER ETHICAL PICTURE: NEW STEP IN EVOLUTION
A cooperative species

A Cooperative Species
HUMAN RECIPROCITY AND ITS EVOLUTION

SAMUEL BOWLES & HERBERT GINTIS
Public Goods game
TRUST
Trust is not Confidence

Trust is a moral phenomenon, not an epistemic one
Reputation, gossip and the social brain

We shouldn't gossip!

... Well then, you can leave.
SUPER COOPERATORS
Altruism, Evolution, and Why We Need Each Other to Succeed
Martin A. Nowak
with Roger Highfield
5 Evolutionary Rules of Cooperation for Natural Selection*

<table>
<thead>
<tr>
<th>Rule</th>
<th>Description</th>
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<tbody>
<tr>
<td>Kin Selection</td>
<td>People are most motivated to help those in closest genetic relationship</td>
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<tr>
<td>Direct Reciprocity</td>
<td>People will cooperate with others in expectation of direct reciprocity in future</td>
</tr>
<tr>
<td>Indirect Reciprocity</td>
<td>In a community, people will help others because they know reputation value affects future engagement with unknown people living in the same community</td>
</tr>
<tr>
<td>Spatial Selection</td>
<td>People are motivated to cooperate with those who live or work in closest physical proximity. [Eg: neighborhood associations]</td>
</tr>
<tr>
<td>Group Selection</td>
<td>People who are members of one or more smaller, interconnected groups will cooperate more than people who are members of a small number of large,</td>
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</table>
Block chain as a new moral technology

- A technology that supports human beings in a high tech and hyper-connected digital world as moral and pro-social persons without recourse to the mechanisms we have developed in the course of the evolution of homo sapiens in order to give and gauge reliable signals of trustworthiness.