Human-Centered Design Course 2020
TDA486 / TIA100

ETHICS IN DESIGN

Towards Sustainable Futures

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BACKGROUND

My Background

My background: theoretical physics, computer science, philosophy of computing, ethics, computational models of cognition,
recent interest: interaction design & interdisciplinary/transdisciplinary study of AI.

My Background: Teaching Ethics

CDT409 - Professional Ethics (earlier version CD5590) MDH

GFOK025 - Research Ethics & Sustainable Development, Chalmers University of Technology, PhD course (2014 – 2017)

CDT403 - Research Methods in Natural Sciences and Engineering (2000 – 2014) MDH

CIU280 - Emerging Trends in Interaction Design – (2018–now) Chalmers

HCD-TDA486 – Human-Centric Design – (2018-now) Chalmers – Lecture on Design Ethics

For the complete list, see: http://www.gordana.se/work/courses.html

My Background: Research in Ethics

Holstein, T.* Dodig-Crnkovic G. and Pelliccione P. Steps Towards Real-world Ethics for Self-driving Cars. Beyond the Trolley Problem, Chapter in the Handbook of Machine Ethics and Morality, forthcoming 2021, IGI Global

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Sapienza*, G., Dodig-Crnkovic, G. and I. Crnkovic. Inclusion of ethical aspects in multi-criteria decision analysis. In 2016 1st International Workshop on Decision Making in Software ARCHitecture (MARCH), pages 1–8, April 2016.

Thekkilakattil* A. and G. Dodig-Crnkovic. Ethics aspects of embedded and cyber-physical systems. In 2015 IEEE 39th Annual Computer Software and Applications Conference, volume 2, pages 39–44, July 2015.

Dodig Crnkovic, G. and B. Curuklu Robots: ethical by design. Ethics and Information Technology, 14(1):61–71, Mar 2012.

Dodig-Crnkovic, G. and D. Persson. Sharing moral responsibility with robots: A pragmatic approach. In Proceedings of the 2008 Conference on Tenth Scandinavian Conference on Artificial Intelligence: SCAI 2008, pages 165–168, Amsterdam, The Netherlands, IOS Press. 2008.

http://www.gordana.se/work/publications.html

My Background: Ethics Lectures

AI From Philosophy to Ethics to Science to Technology to Law and Back. Thoughts from an European perspective
CHAIR ETHICS SEMINAR, CHALMERS 2020 02 25

DESIGN ETHICS: Towards Sustainable Futures at Act! Sustainable conference, Gothenburg 2019 11 07

AI Ethics CHALMERS, Gothenburg 2019 10 21

Ethics in the Design of Intelligent Artifacts, AI for Health and Healthy AI conference
CHALMERS & Gothenburg University, Gothenburg 2019 08 28

Ethics in the Design of Intelligent Artifacts, NTNU Trondheim, Norwey, 2019 06 19
The Big Challenges Science Festival. Code of Ethics.

IDEA League School Engineering Complex Systems with Big data and Information Technology ECS-BIT'18, Chalmers Gothenburg

Seminar on ETHICS, FORA Fog Computing for Robotics and Industrial Automation Summer School 2018, Vienna

Guest lecture for the Supply Chain Management Master Program, Chalmers, 2017

Research Ethics 2017 09 11 Cognition and Communication Master Program, University of Gothenburg

Risk-based Decision-making Fallacies: Why Present Functional Safety Standards Are Not Enough

MARCH2017 International Workshop on decision Making in Software Architecture @ ICSA 2017 Gothenburg, Sweden. 04.04.2017.

http://www.gordana.se/work/presentations.html

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SUSTAINABILITY

Towards Sustainable Futures…

"We have not inherited the Earth from our fathers.
We are borrowing it from our children."

Native American saying

Three Major Environmental Worldviews

PLANETARY MANAGEMENT

- We are apart from the rest of nature and can manage nature to meet our increasing needs and wants
- Because of our ingenuity and technology, we will not run out of resources
- The potential for economic growth is essentially unlimited
- Our success depends on how well we manage the earths life-support system mostly for our benefit.

PLANETARY STEWARDSHIP

- We have an ethical responsibility to be caring stewards of the earth
- We will probably not run out of resources but they should not be wasted
- We should encourage environmentally beneficial forms of economic growth and discourage environmentally harmful ones.
- Our success depends on how well we manage the earth's life-support systems for our benefit and for the rest of nature.

ENVIRONMENTAL WISDOM

- We are a part and totally dependent on nature, and nature exists for all species
- Resources are limited and should not be wasted
- We should encourage earth-sustaining forms of economic growth and discourage earth-degrading forms.
- Our success depends on learning how nature sustains itself and integrating such lessons from nature into the ways we think and act.

Fig. 25-2, p. 663

Environmental Worldviews Lie on a Continuum—from Self- to Earth-Centered

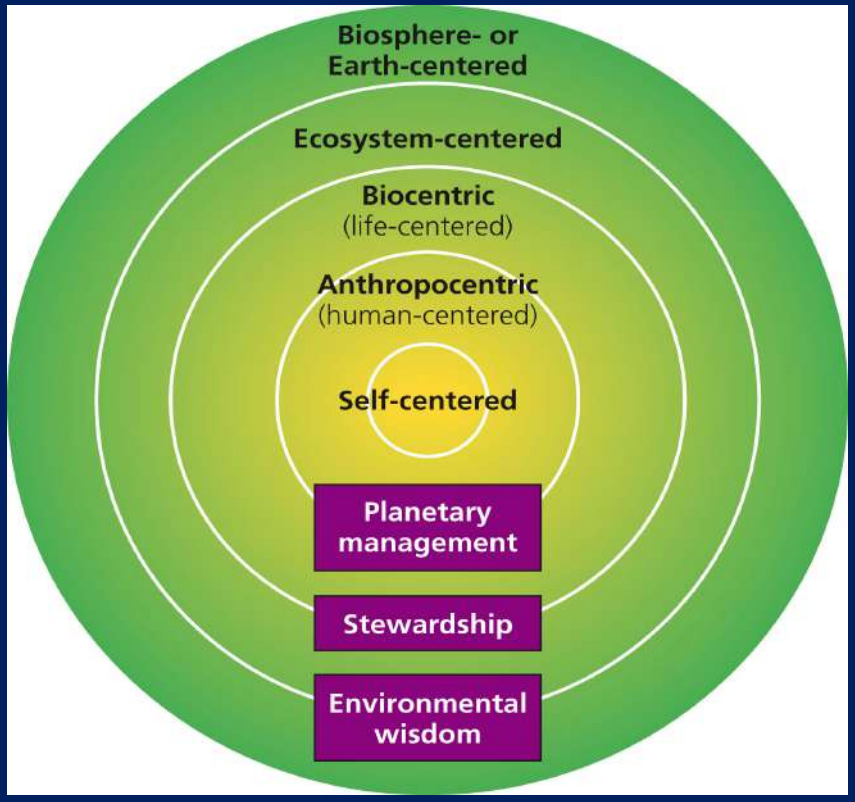


Fig. 25-3, p. 663

Levels of Ethical Concern

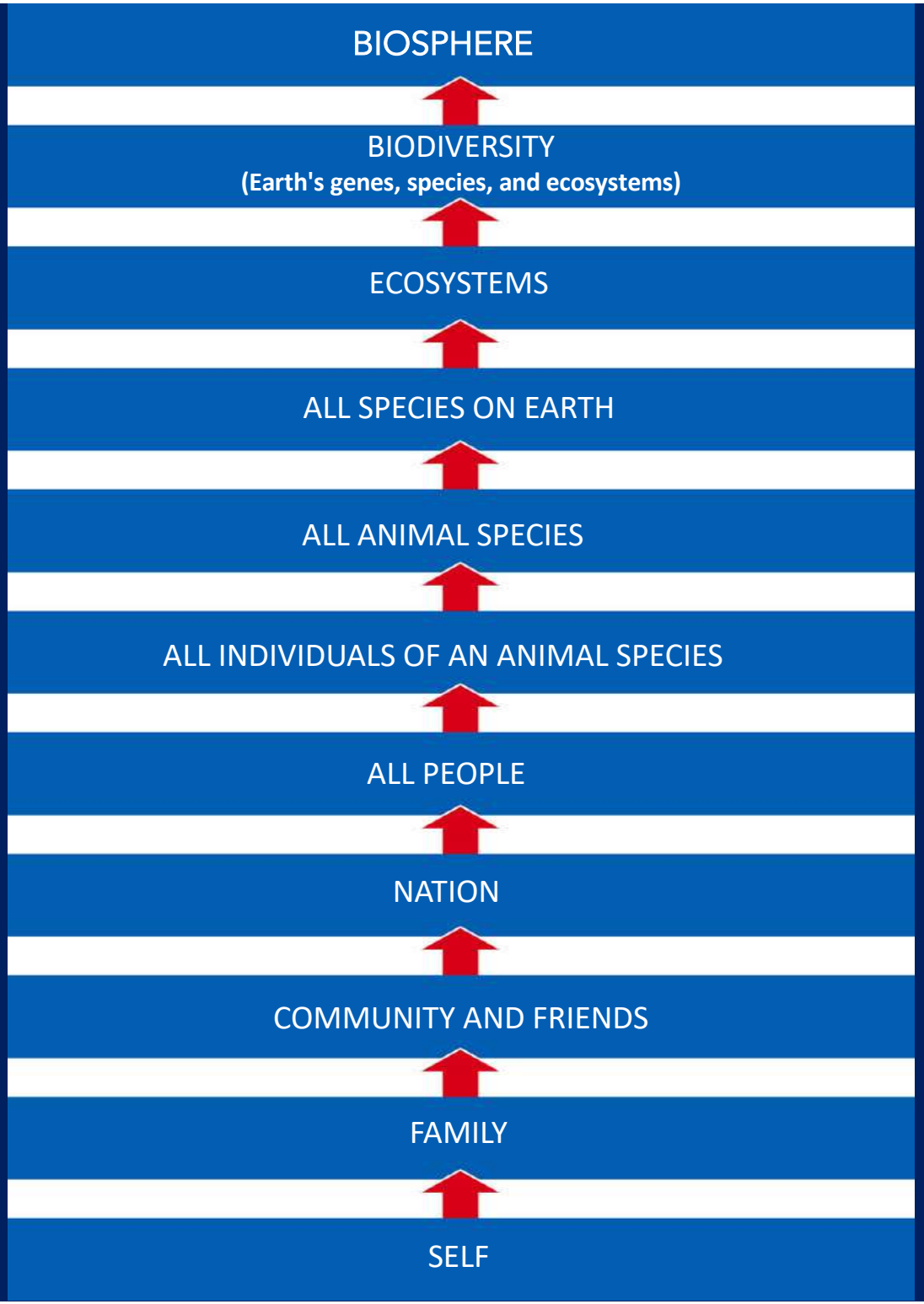
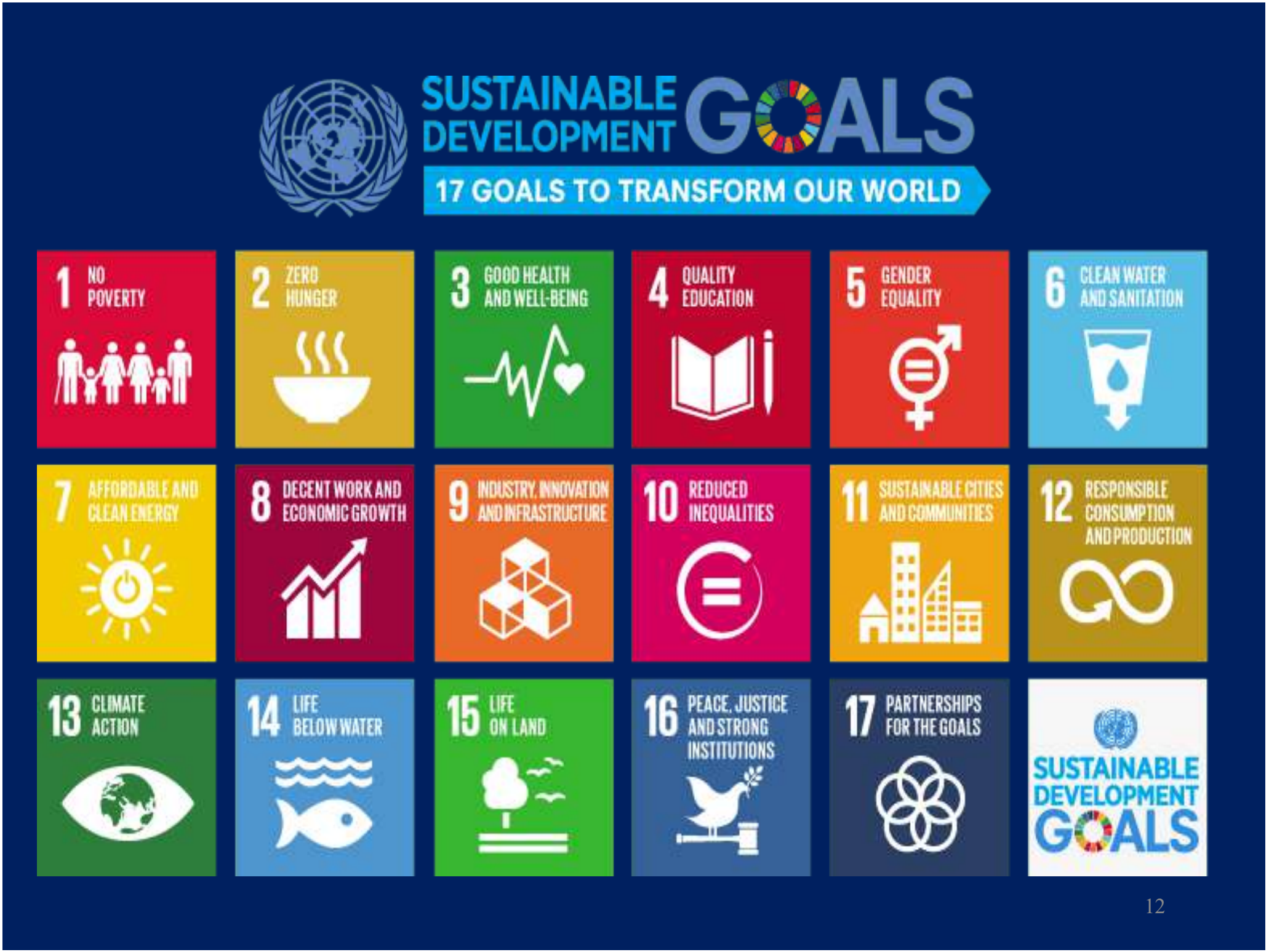
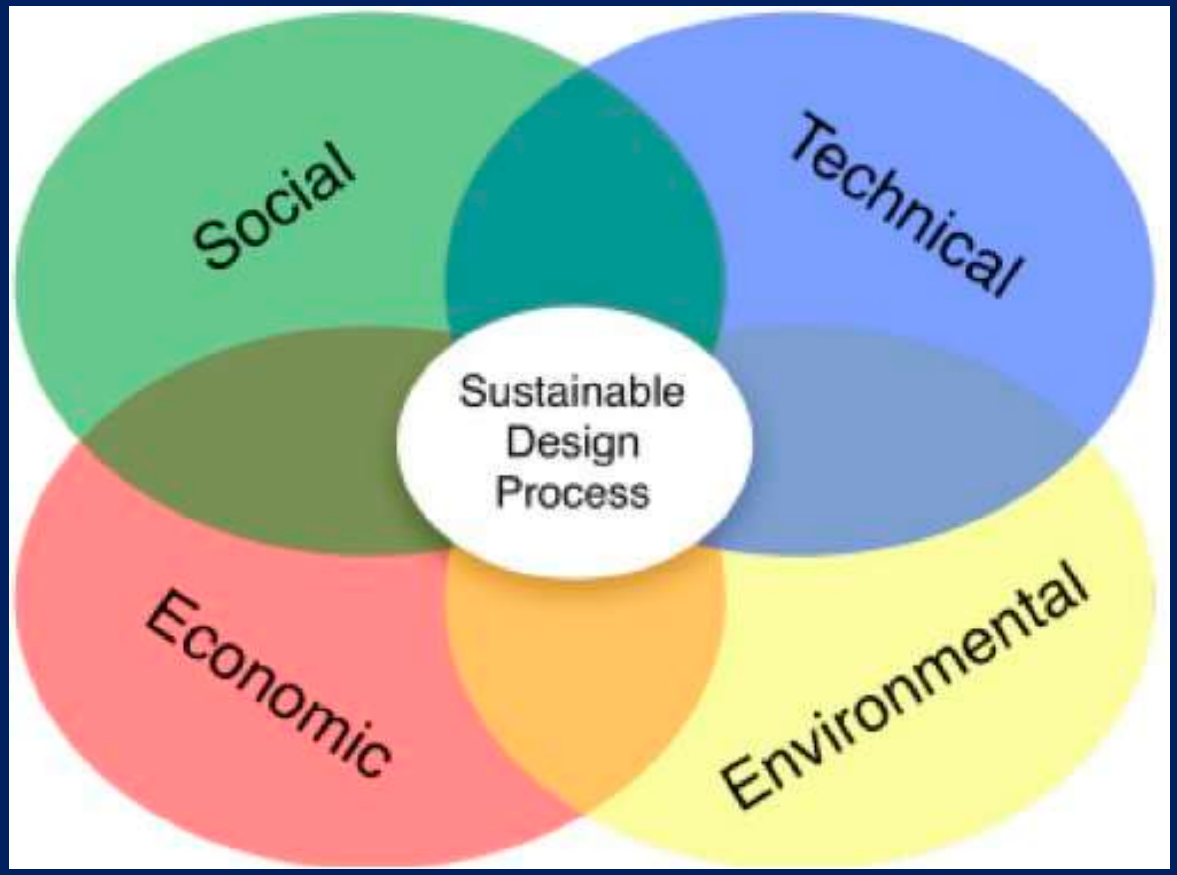


Fig. 25-5, p. 665


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

Sustainable Design Process



On a Vision to Educating Students in Sustainability and Design—The James Madison University School of Engineering Approach. 2011. Sustainability 4(1):72-91 DOI: 10.3390/su4010072

A New Vision for Sustainability

Environmental/sustainability revolution

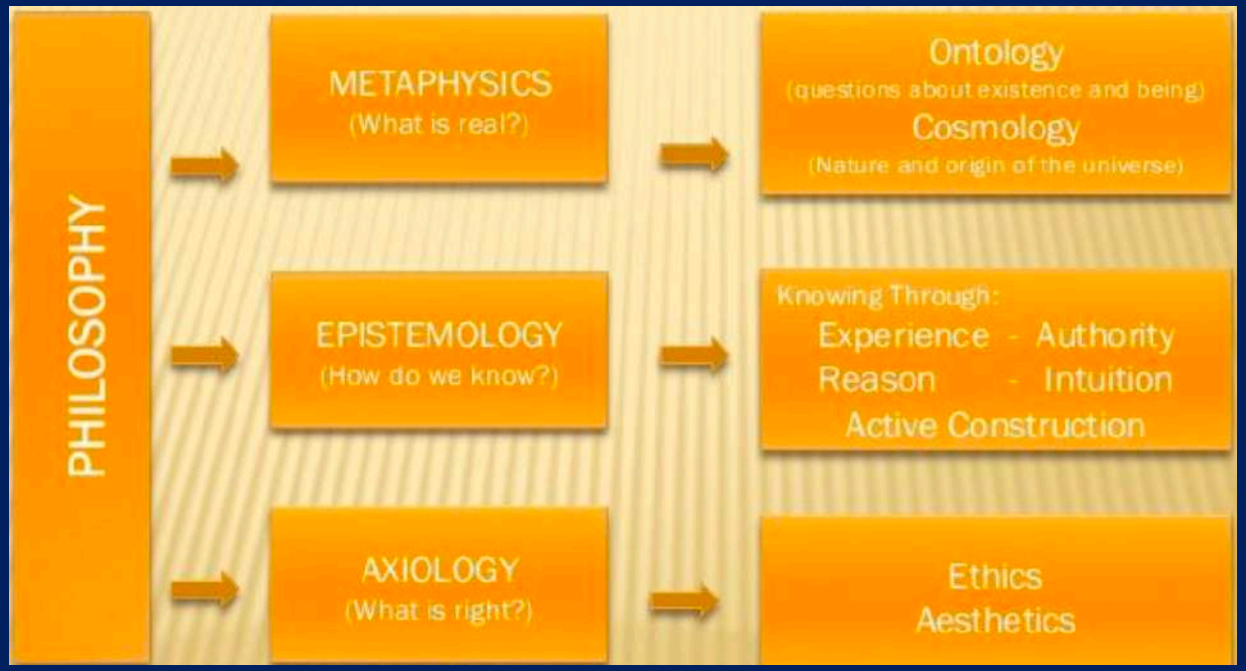
- Major cultural shifts
- Environmental changes
- Social changes
- Technological changes
- Economic changes

We can change faster than we think we can!

DESIGN ETHICS

WHERE DOES ETHICS COME FROM? PHILOSOPHY!

PHILOSOPHY OF "X" (IN OUR CASE, X=DESIGN)



Philosophy → Metaphysics → Ontology
What is X? (X that exists and can exist)

Philosophy → Epistemology
Knowledge of X
(What and how we know about X)

Philosophy → Axiology → Ethics
Good and Bad
Right and Wrong in X

Design Ethics

As the topic of Design Ethics is huge, what this lecture can do is to open the window with a view

Design Constitutes Moral Practices

If ethics is about the question of how to act, and designers help to shape how technologies mediate action, designing should be considered 'ethics by other means. '

Every technological artefact that is used will mediate human actions, and every act of design therefore helps to constitute specific moral practices.

P.P. Verbeek, What Things Do, 2009, p.69

Ethics and Morality - Etymology

Words morality and ethics have the same roots, mores which means manner and customs from the Latin, and etos which means custom and habits from the Greek.

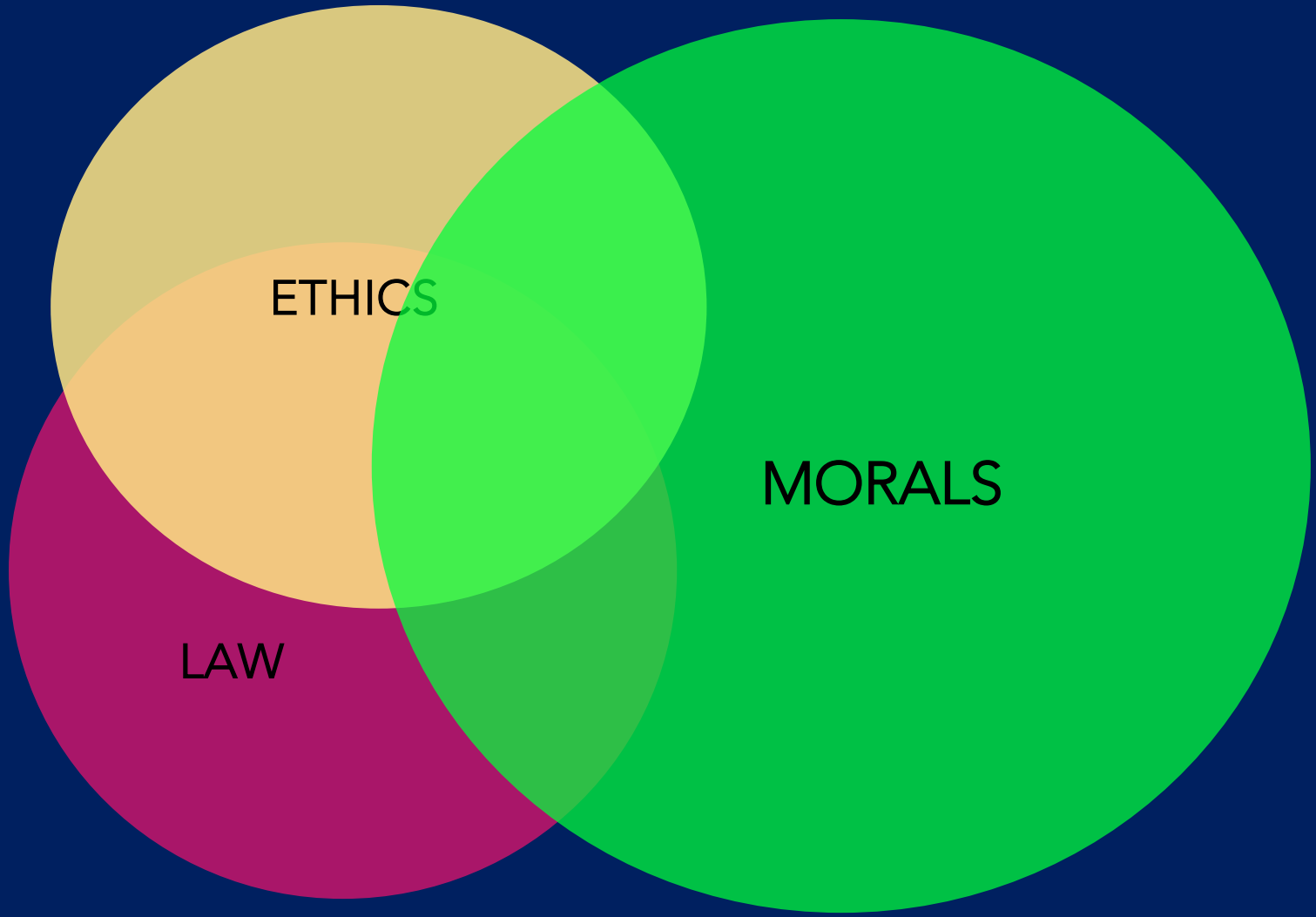
Robert Louden, Morality and Moral Theory

Ethics and Morality

Morality: first-order set of beliefs and practices about how to live a good life.

Ethics: a second-order, conscious reflection on the adequacy of our moral beliefs.

Society, Values and Norms



Classical Approaches to Ethics

The Virtue Ethics

Focuses on attitudes, dispositions, or character traits that enable us to act in ways that develop our human potentials. Examples: honesty, courage, faithfulness, trustworthiness, integrity, etc.

The principle is: What is ethical is what develops moral virtues in ourselves and our communities.

Classical Approaches to Ethics

The Utilitarian Ethics

Focuses on the consequences that actions or policies have on the well-being ("utility") of all persons directly or indirectly affected by the action or policy.

The principle is: Of any two actions, the most ethical one will produce the greatest balance of benefits over harms.

Classical Approaches to Ethics

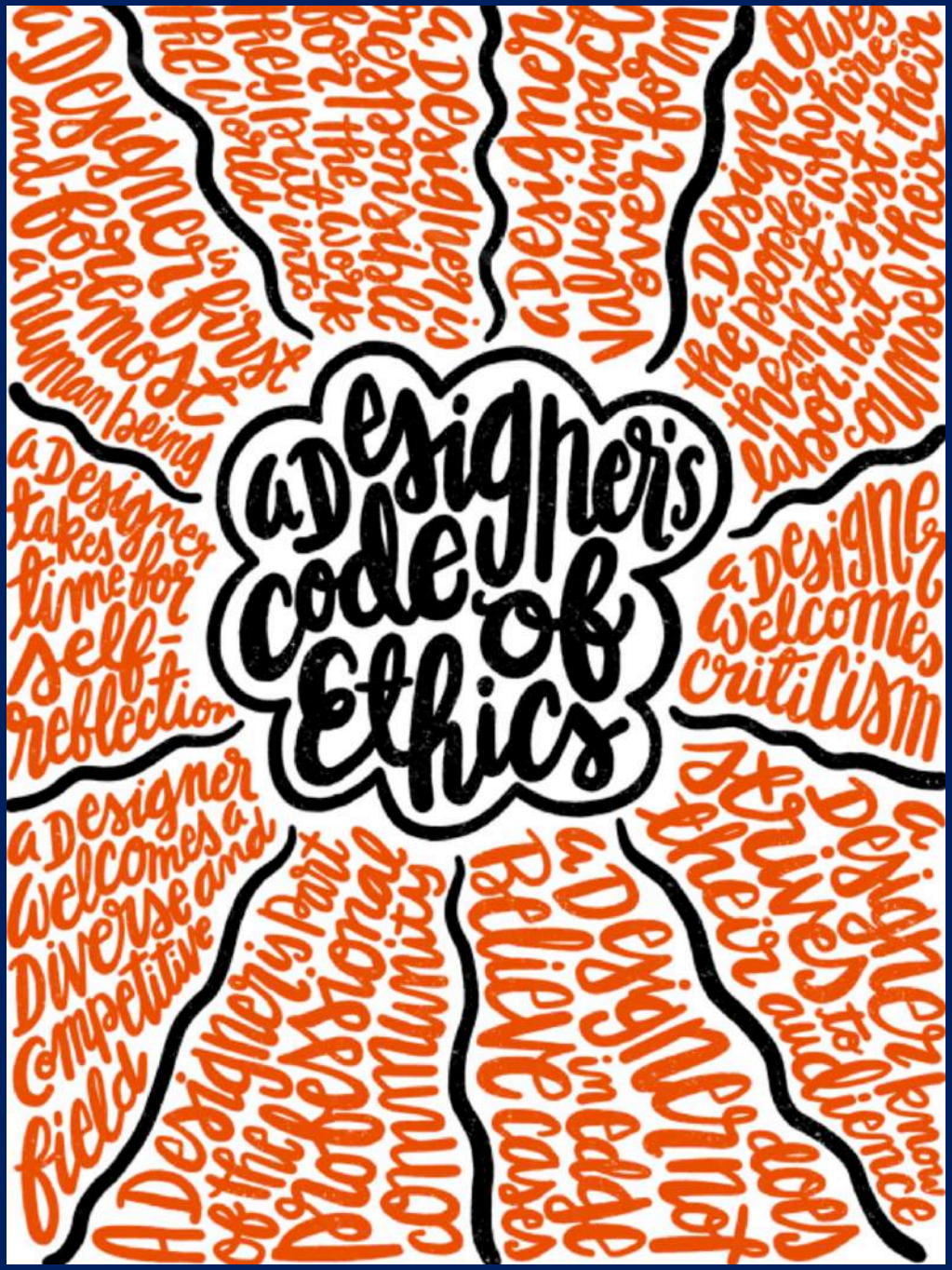
The Rights-Based Ethics

Each person has a fundamental right to be respected and treated as a free and equal rational person capable of making his or her own decisions.

The principle is: An action or policy is morally right only if those persons affected by the decision are not used merely as instruments for advancing some goal, but are fully informed and treated only with their informed consent.

Designers Own Initiatives to Integrate Ethics into Design

Designer's Code of Ethics



A Designer's
Code of Ethics

A designer is first and foremost a human being.

is responsible for the work they put into the world.

values impact over form.

owes the people who hire them not just their labor, but their counsel.

welcomes criticism.

strives to know their audience.

does not believe in edge cases.

is part of a professional community.

welcomes a diverse and competitive field.

takes time for self-reflection.

Code of Conduct Example

Object of the code

to state the principles for an international basis of ethical

standards related to the practice of design which are accepted by all Member organizations of ico-D.

A designer's responsibility

to the community, to the client, to other designers

A designer's remuneration

Competition

Publicity

Code does not mention sustainability and circular economy other than indirectly via ecology.

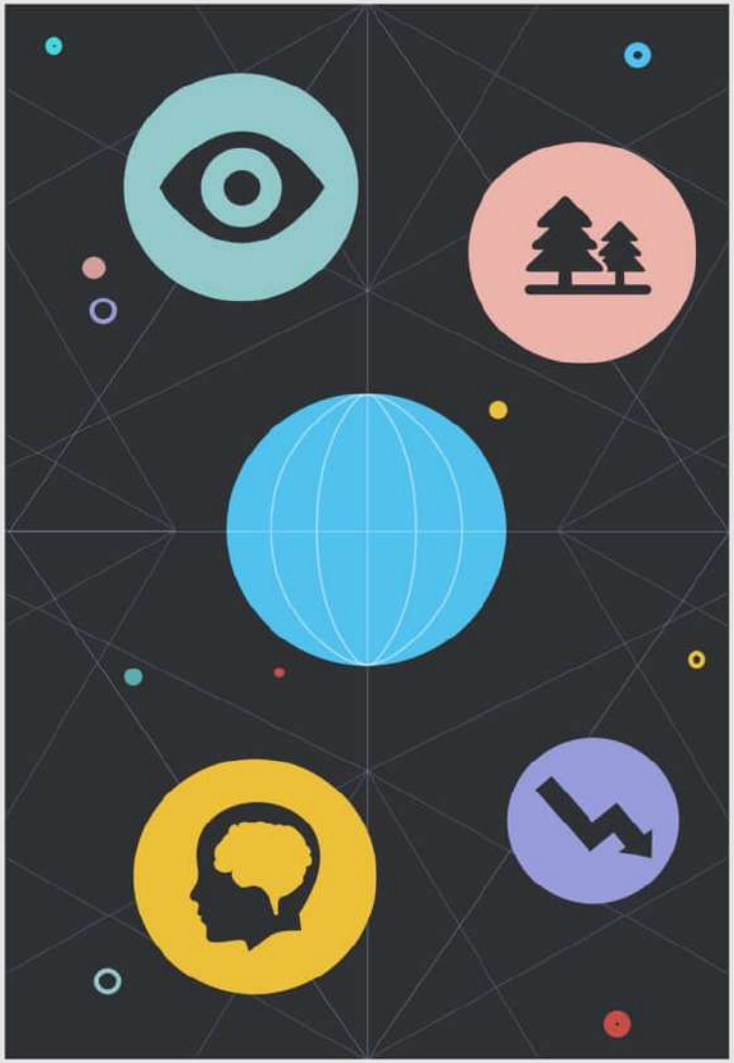
http://www.ico-d.org/database/files/library/icoD_BP_CodeofConduct.pdf

Hippocratic Oath for Design

THE DESIGNER'S
HIPPOCRATIC OATH
mad•pow

I swear to fulfill, to the best of my ability and judgment, this covenant: I will respect the hard-won **knowledge of the human condition** of those designers in whose steps I walk, and gladly share such **empathetic decisions** as is mine with those who are to follow.

I will apply, for the benefit of the people, all measures that are **ecocentric and holistic**, avoiding those twin traps of **behavioral manipulation** and **pure profitability**.



Hippocratic Oath for Design

AI ethics manifesto

Powered by FJORD - Design and Innovation from Accenture Interactive

This manifesto was co-created at WIRED Live 2017 by Fjord, Accenture, and WIRED Live delegates.

We will...

01.
Think twice before creating AI even though we know it is technically possible.

02.
Create AI with an aim to enrich people's lives.

03.
Set boundaries as well as goals.

04.
Consider the unintended consequences and AI's impact on society.

05.
Keep data safe, secure and anonymised.

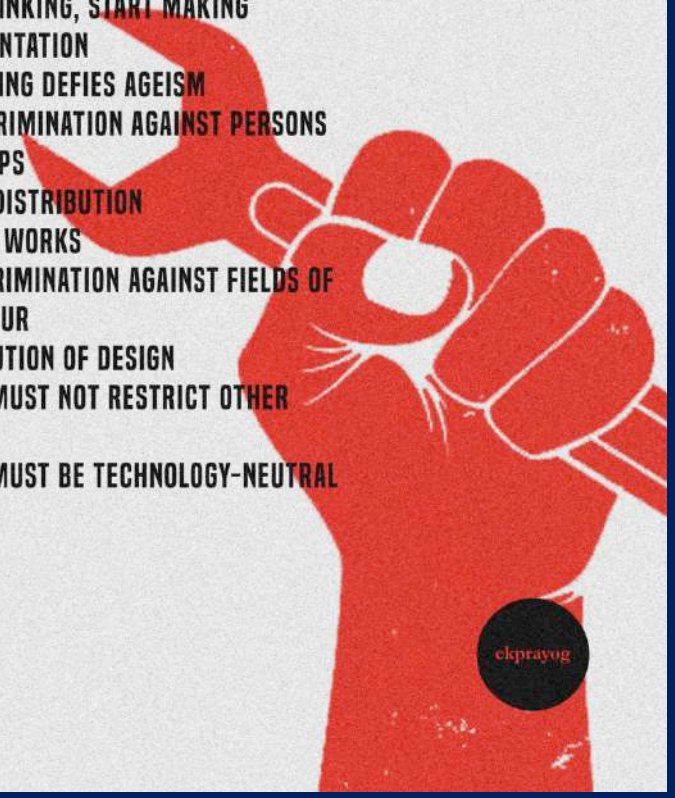
06.
Use automation to help us become better humans.

07.
Create a fair and equal system, devoid of cultural nuance.

08.
Take responsibility for the AI systems we create.

OPEN DESIGN MANIFESTO

#01 DESIGN IS OF, BY & FOR THE PEOPLE
#02 LEARNING IS EVERYTHING
#03 OPEN COLLABORATION
#04 STOP THINKING, START MAKING
#05 DOCUMENTATION
#06 MENTORING DEFIES AGEISM
#07 NO DISCRIMINATION AGAINST PERSONS OR GROUPS
#08 FREE REDISTRIBUTION
#09 DERIVED WORKS
#10 NO DISCRIMINATION AGAINST FIELDS OF ENDEAVOUR
#11 DISTRIBUTION OF DESIGN
#12 DESIGN MUST NOT RESTRICT OTHER DESIGNS
#13 DESIGN MUST BE TECHNOLOGY-NEUTRAL



https://ekprayogblog.wordpress.com/2017/07/13/open-design-manifesto/

Ethics for Designers
Web Resources

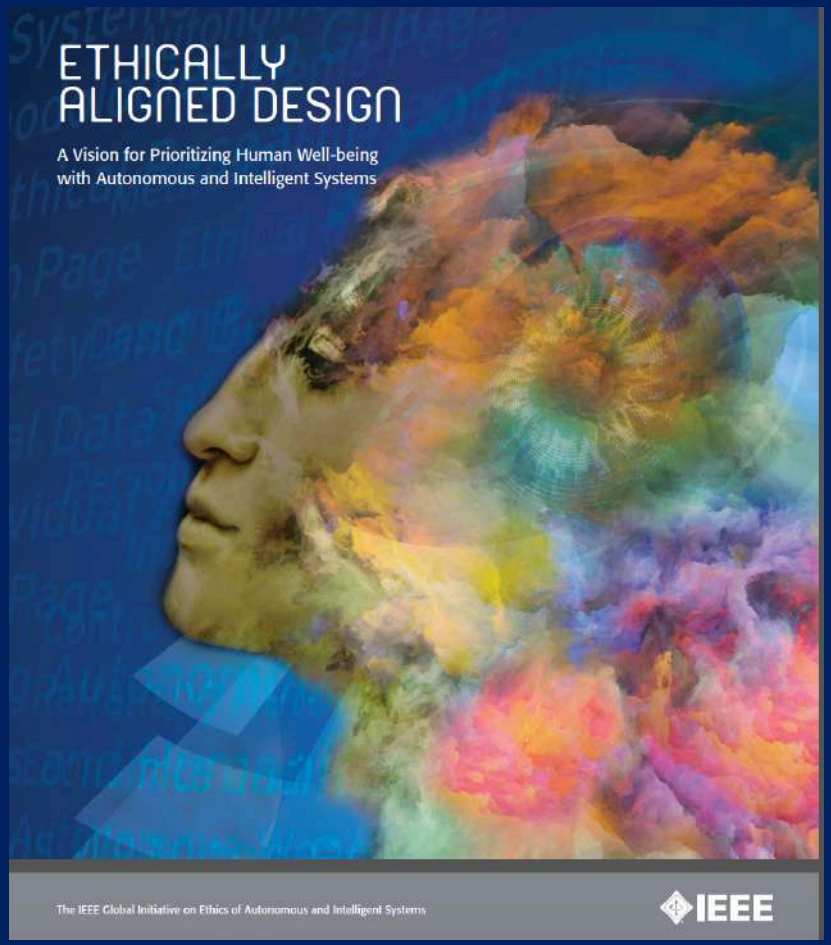
Ethics for designers web resources

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

ETHICS for Designers

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

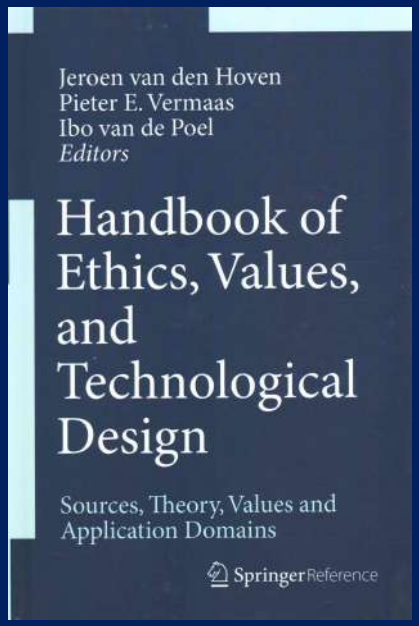
Ethically Aligned Design & Trustworthy AI

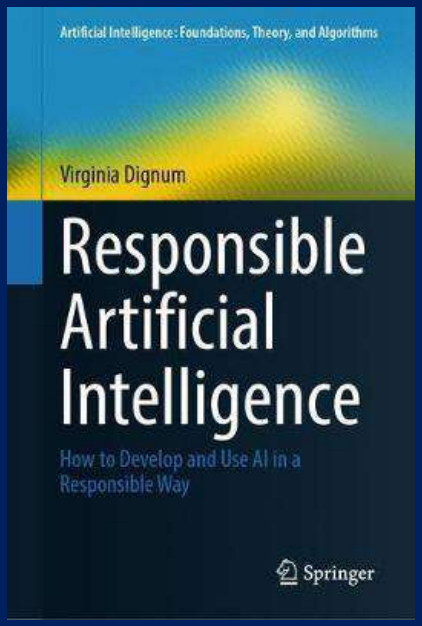


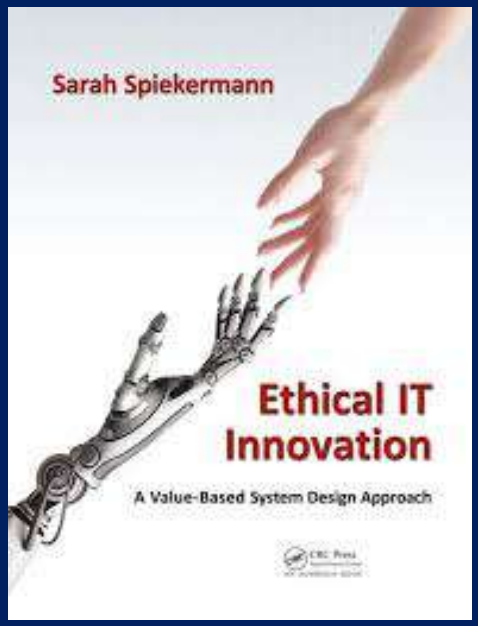
https://ethicsinaction.ieee.org/

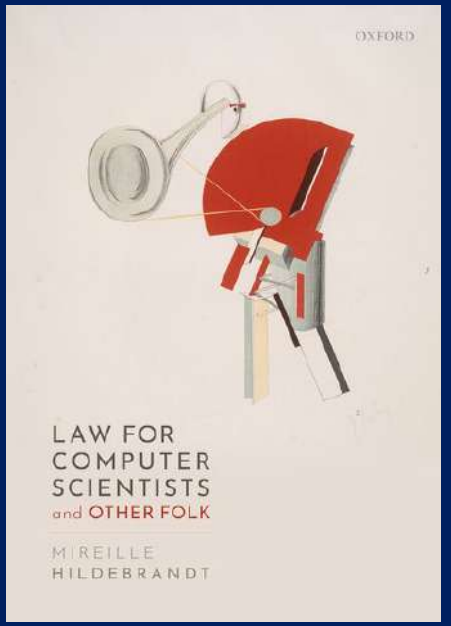
https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai

RECENT BOOKS









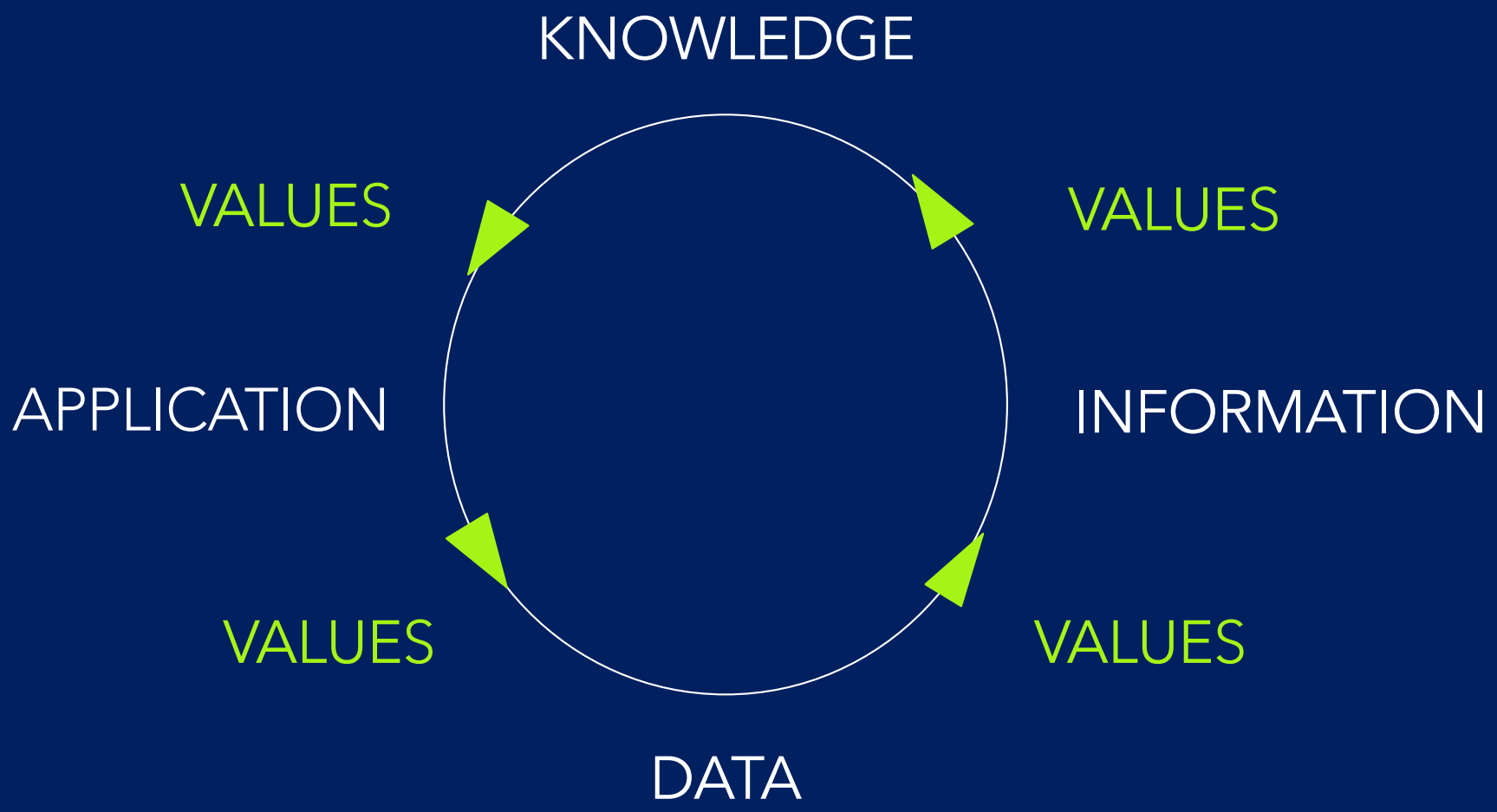
VALUES AND ETHICS

VALUES AND ETHICS OF KNOWLEDGE

Based on the article:

Nancy Tuana (2015) Coupled Ethical-Epistemic Analysis in Teaching Ethics. Critical reflection on value choices. CACM VOL. 500 NO. 12. Pages 27-29

Values in the Knowledge Production



Values

Values serve as a guide to action and knowledge. They are relevant to all aspects of scientific and engineering practice, including discovery, analysis, and application.

Values and emotions

"The decisions that scientists and others need to make about what projects to pursue, what theories to accept, and what applications to enact will unavoidably have an emotional, value-laden aspect."

"The best course is not to eliminate values and emotions, but to try to ensure that the best values are used in the most effective ways."

Paul Thagard

Ethics in the Value-Sensitive Design Approach

Mary L. Cummings

Specific human values to be considered in the design process:

- Human Welfare,
- Ownership And Property,
- Privacy,
- Freedom from bias,
- Universal usability,
- Trust,
- Autonomy,
- Informed consent,
- Accountability,
- Identity, and
- Environmental Sustainability. [Rather: Environmental, Social, Economic, Technological etc.]
- Calmness [Rather: Cognitive sustainability]

What are values?

DESIGN ETHICS & VALUE-SENSITIVE DESIGN

One way to introduce ethics into the design is through Value-sensitive design which is based on the insight that artefacts are value-loaded. We identify values embedded in technologies by studying its use.

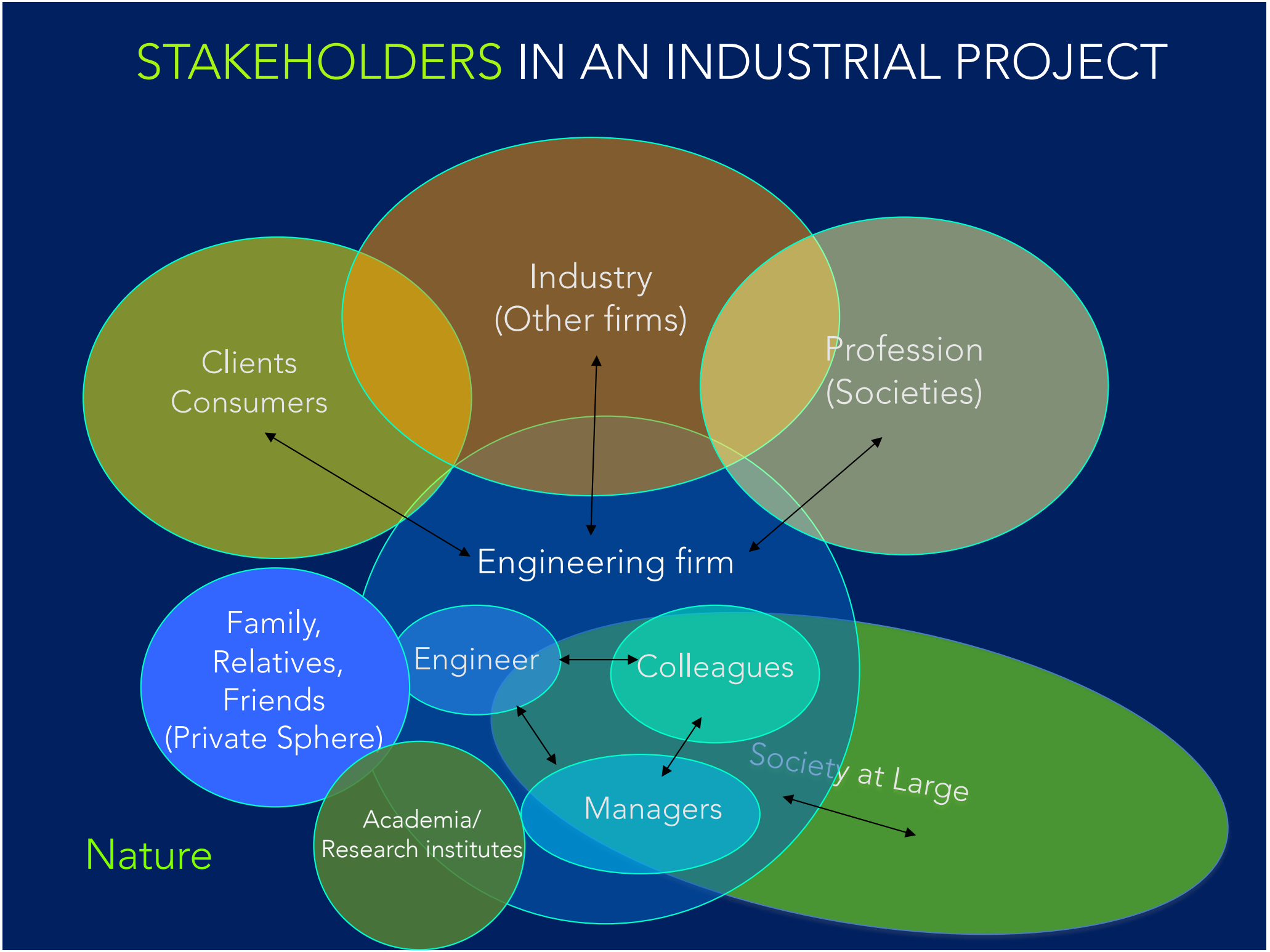
"Value" is defined broadly as property that a person or a group considers important, and designers can intentionally or unintentionally inscribe their values in the design objects thus shaping them accordingly.

For example, for intelligent technologies some of important values are: *safety, security, privacy, autonomy, trust, fairness, non-maleficence, beneficence, reliability, responsibility, sustainability.*

The design is typically carried out iteratively and values are being assimilated by combining the following approaches: conceptual, technical – empirical and research, with a continuous assessment and learning process within the ecology of socio-technological system.

STAKEHOLDERS

STAKEHOLDERS IN AN INDUSTRIAL PROJECT



STAKEHOLDERS IN A PHD PROJECT

New Technological Challenges

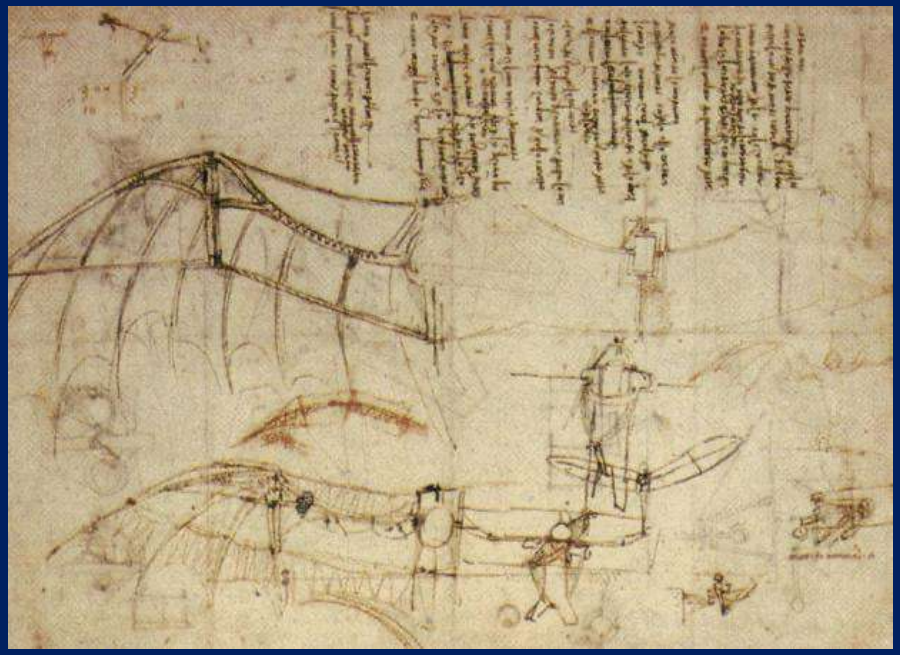
- Big data (Cambridge Analytica, Strava tracking app)
- Internet of things – internet of everything
- Intelligent cities
- Autonomous cars (Discuss: Uber Arizona crash)
- Autonomous intelligent software in control systems, information systems etc.
- Cyberphysical intelligent systems
- Adaptive (machine-larning) systems (such as ambient intllignce, traffic, decision-making)
- Sustainability (Environmental, Social, Technological, Cognitive) & Circular Economy

AN EXAMPLE

SUSTAINABLE DESIGN-BIOMIMETICS

SUSTAINABLE Nature-Inspired Technologies

Biomimetics



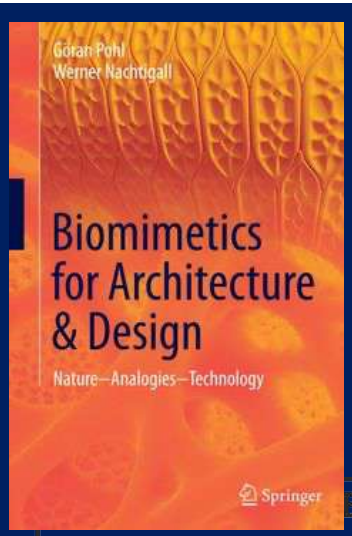
https://library.acropolis.org/wp-content/uploads/2015/05/Leonardo_Design_for_a_Flying_Machine_c._1488.jpg

BIOMIMETICS

Biomimicry is the practice of applying lessons from nature to the invention of healthier, more sustainable technologies for people. Biomimetic designers ("biomimics") focus on understanding, learning from, and emulating the strategies used by living things, with the intention of creating designs and technologies that are sustainable.

https://toolbox.biomimicry.org/introduction/

EXAMPLES OF BIOMIMETIC DESIGN



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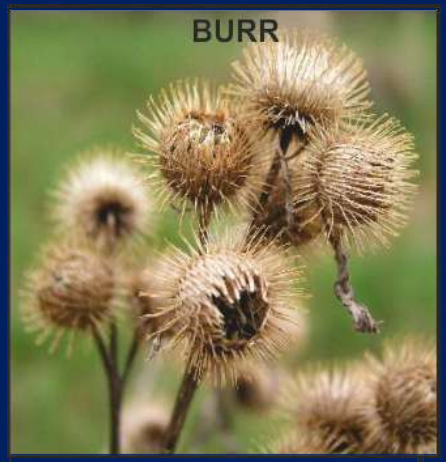


VELCRO

WHALE FIN

BLADE

INTERNATIONAL TERMINAL

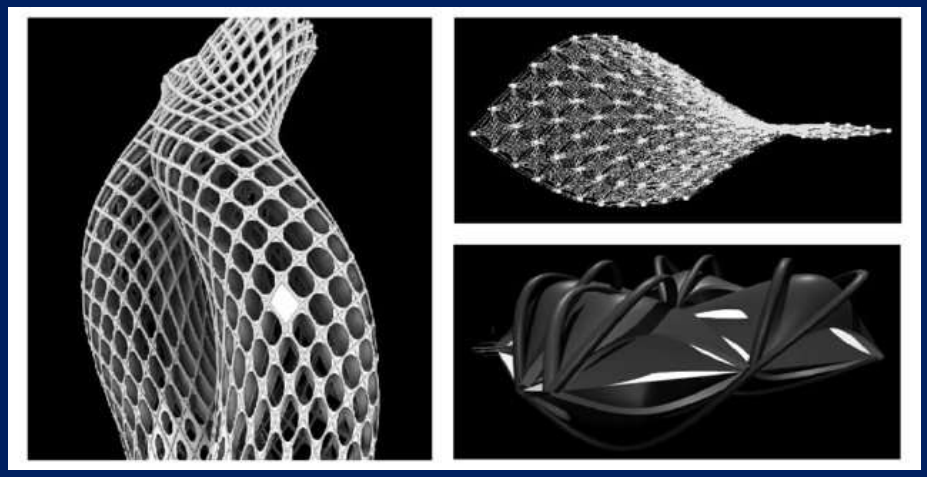
JAPANESE BULLET TRAIN

KINGFISHER

http://www.technologystudent.com/prddes1/biomimetic1.html

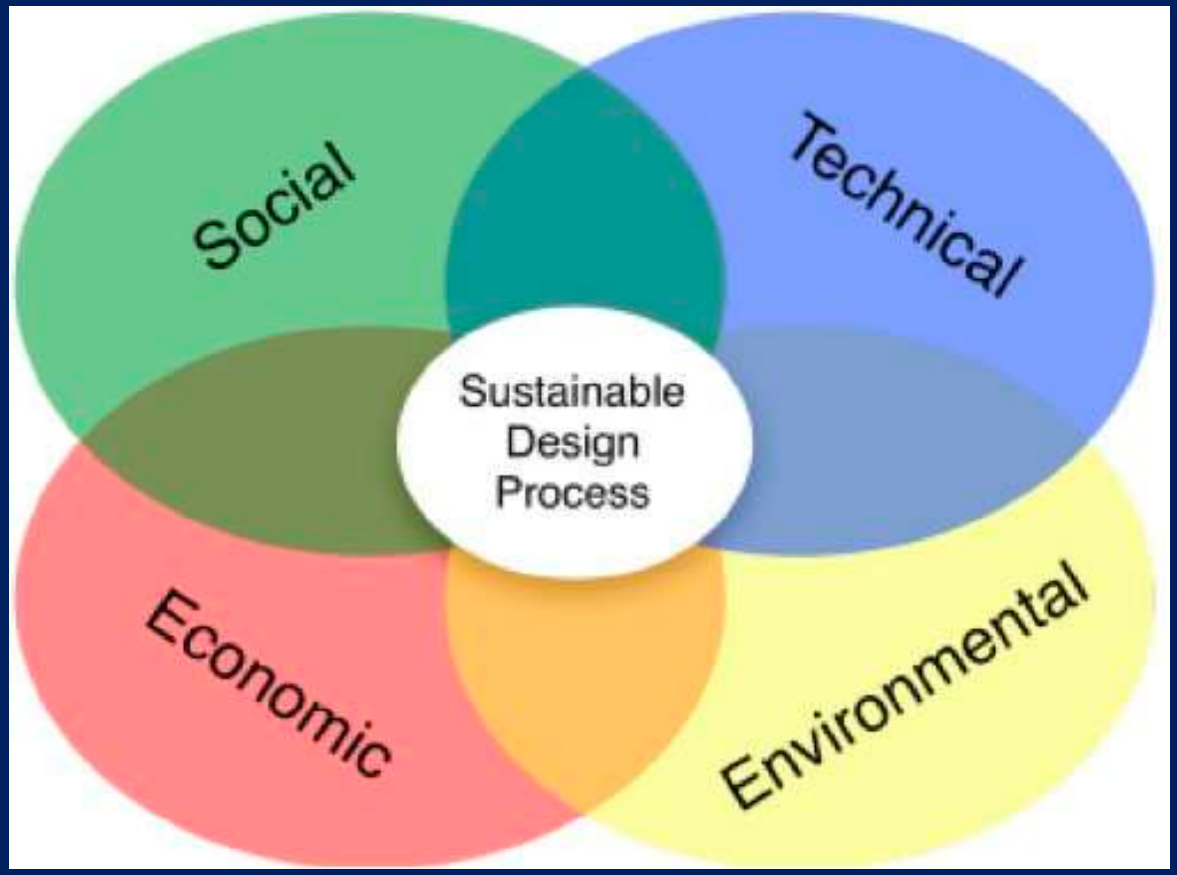
NERI OXMAN, MIT

Design at the Intersection Between Technology and Biology



https://www.ted.com/talks/neri_oxman_design_at_the_intersection_of_technology_and_biology/discussion?utm

Sustainable Design Process



On a Vision to Educating Students in Sustainability and Design—The James Madison University School of Engineering Approach. 2011. Sustainability 4(1):72-91 DOI: 10.3390/su4010072

DISCUSSION TIME!

Ethics for Design

https://vimeo.com/232973887

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? (0:00 – 15:12)
2. Is there something wrong with design? (15:12 – 19:24)
3. Ethics and Morality (19:24 – 31:30)
4. How designers can do better? (31:30 – 49:43)

Ethics for Design

1. What does a designer do? (0:00 – 15:12)

- 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
- 11:14 Design for values – Nicolas Nova, The Near Future Lab Geneva
- 11:43 Geoffrey Dorne, Design & Human, Paris. App for communication between refugees
- 13:08-15:12 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? (15:12 – 19:24)

15:12

- 15:20 Arrogance of the profession
- 16:00 Designers as celebrities
- 16:15 Myths of designers creativity and superiority & genius
- 16:51 “design washing” like “green washing” for marketing
- 17:33-18:51 Sarah Gold:
  - Design is not taken seriously
  - Technology is moving too quickly
  - Rights we expect to have (this was before GDPR):

    To be informed; To access; To rectification; To erasure; To restrict processing; To data portability; To object; To automated decisions & profiling
- 18:49-19:24 Simplifies and reduces real world complexity. How to define good?

Ethics for Design

3. Ethics and Morality (19:24 – 31:30)

19:24 – 21:09 Ethics and Morality

- 21:09 -21:41 James Williams, doctoral candidate on attention ethics at Oxford University, Time Well Spent. Ethics as "the world it aught to be"
- 22:32 – 24:36 Matthieu Cherubi, Design technologist, Shanghai – machine ethics, car ethics
- 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 – 49:43)

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

REFERENCES

REFERENCES

Material And Digital Design Synthesis

https://www.youtube.com/watch?v=JN7BUKb0OIA Programmable matter (video)

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