Workshop CESAER Responsible Innovation & Education

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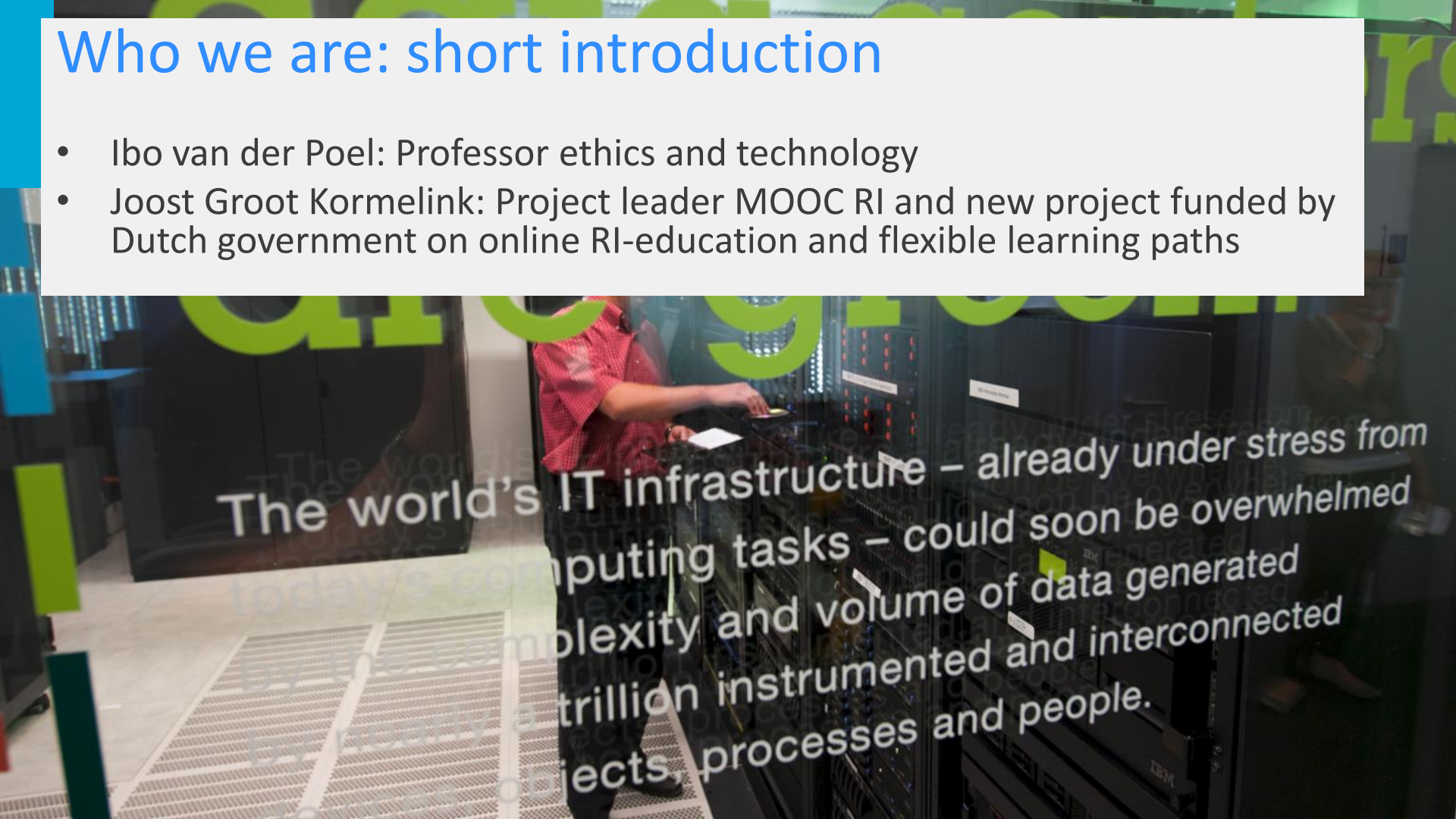
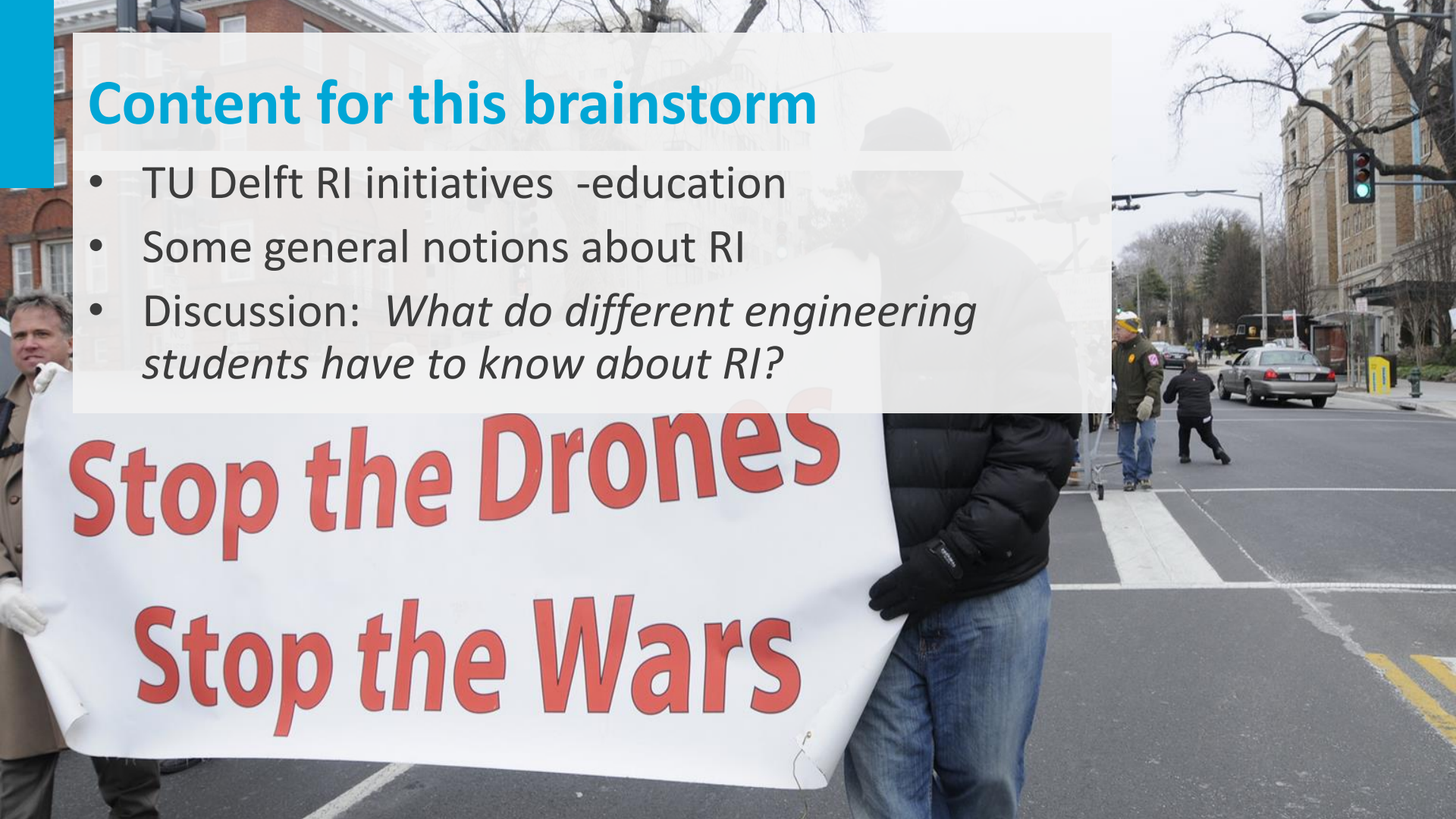
Who we are: short introduction

- Ibo van der Poel: Professor ethics and technology
- Joost Groot Kormelink: Project leader MOOC RI and new project funded by Dutch government on online RI-education and flexible learning paths



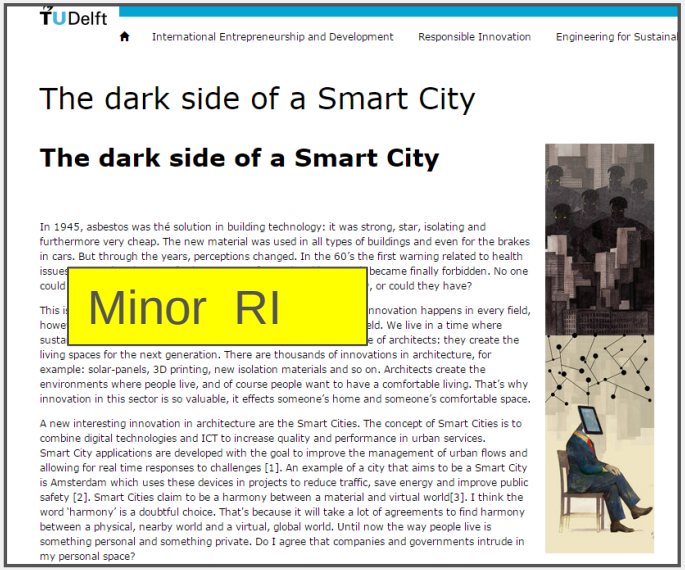
Content for this brainstorm

- TU Delft RI initiatives -education
- Some general notions about RI
- Discussion: *What do different engineering students have to know about RI?*



RI and education: some new initiatives TU Delft

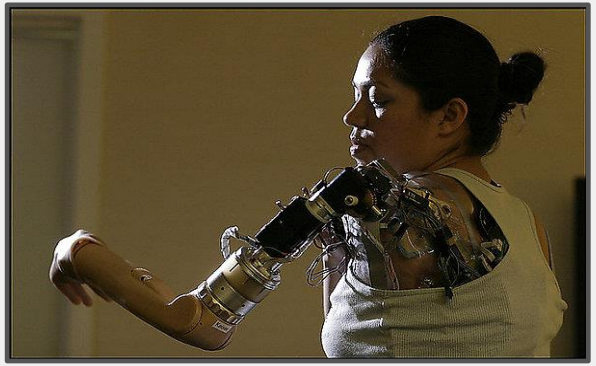
edX
Courses
How It Works
Schools & Partners
About
I want to learn about...
Responsible Innovation
Responsible Innovation – exploring the interface of ethics, society and technological innovations
TU Delft
MOOC RI


TU Delft
International Entrepreneurship and Development
Responsible Innovation
Engineering for Sustainal
The dark side of a Smart City
The dark side of a Smart City
In 1945, asbestos was thé solution in building technology: it was strong, star, isolating and furthermore very cheap. The new material was used in all types of buildings and even for the brakes in cars. But through the years, perceptions changed. In the 60's the first warning related to health issues became finally forbidden. No one could , or could they have?
This i nnovation happens in every field, howe ld. We live in a time where susta e of architects: they create the living spaces for the next generation. There are thousands of innovations in architecture, for example: solar-panels, 3D printing, new isolation materials and so on. Architects create the environments where people live, and of course people want to have a comfortable living. That's why innovation in this sector is so valuable, it effects someone's home and someone's comfortable space.
A new interesting innovation in architecture are the Smart Cities. The concept of Smart Cities is to combine digital technologies and ICT to increase quality and performance in urban services. Smart City applications are developed with the goal to improve the management of urban flows and allowing for real time responses to challenges [1]. An example of a city that aims to be a Smart City is Amsterdam which uses these devices in projects to reduce traffic, save energy and improve public safety [2]. Smart Cities claim to be a harmony between a material and virtual world[3]. I think the word 'harmony' is a doubtful choice. That's because it will take a lot of agreements to find harmony between a physical, nearby world and a virtual, global world. Until now the way people live is something personal and something private. Do I agree that companies and governments intrude in my personal space?
Minor RI

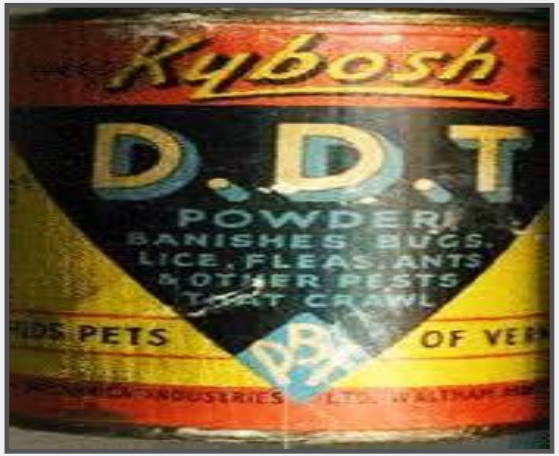
TU Delft
From campus students to professional learners: Flexible learning paths in Responsible Innovation
Startdatum: 1-9-2015
Einddatum: 31-12-2016
Our ambition for this project is to develop
Responsible Innovation (RI) for different ta
• Our on-campus engineering students;
• Professionals (engineers/designers/architects and decision makers/executives).
Online education for campus students and professionals (Funded by Dutch government)

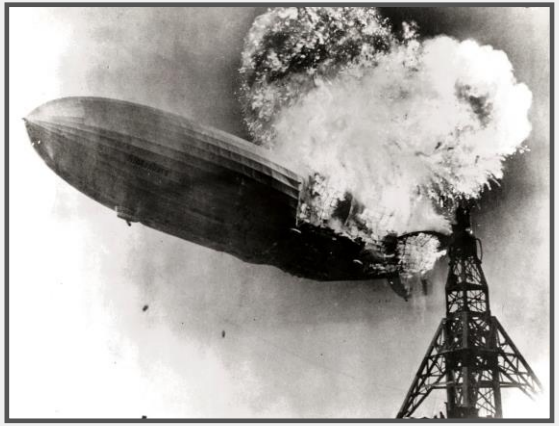
2. Some general notions about RI

A. Innovation bring a lot of goods

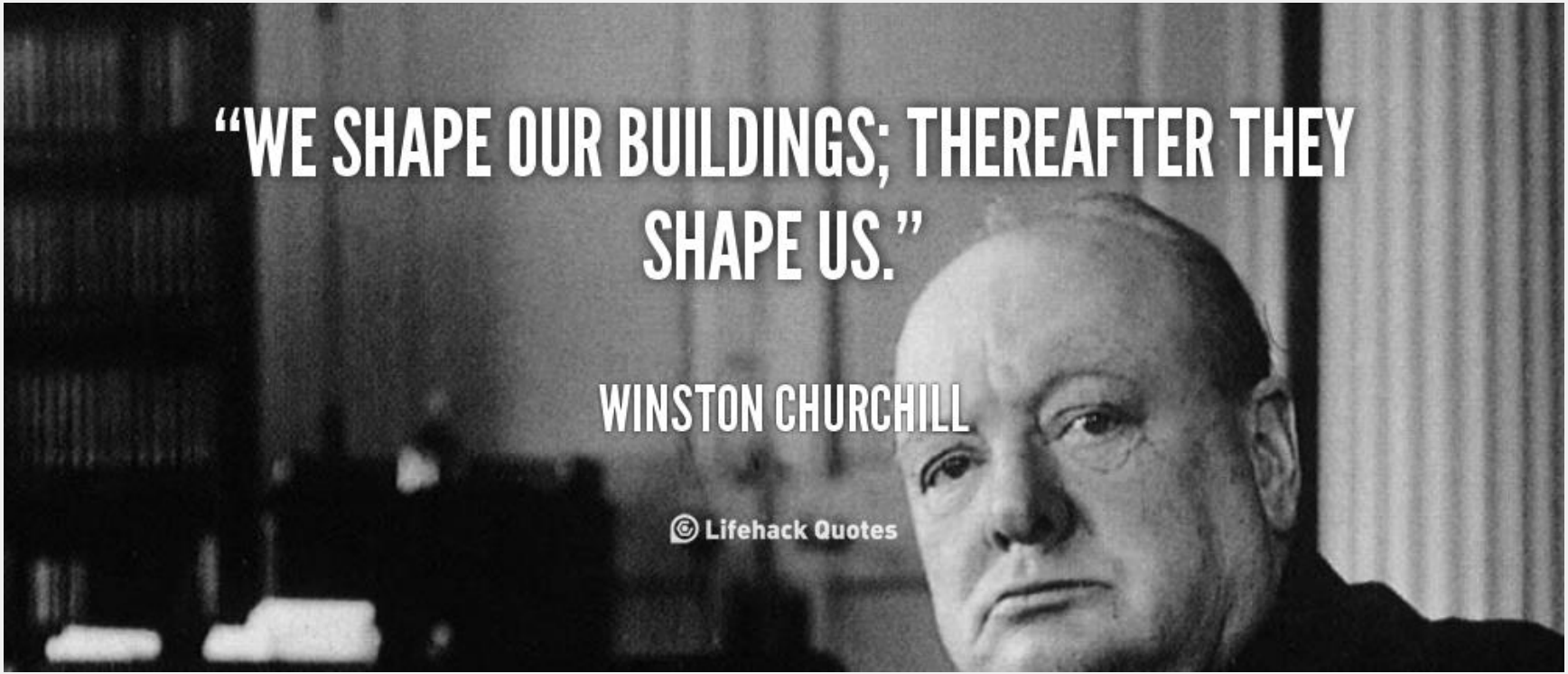


But is not a good in itself





B. Technology is never ‘value neutral’


“WE SHAPE OUR BUILDINGS; THEREAFTER THEY SHAPE US.”
WINSTON CHURCHILL
Lifehack Quotes

C. We have to address many challenges

- Clean drinking water
- Food production
- Climate Change
- Overfishing
- Deforestation
- Sustainable Energy
- Waste Management
- Affordable Health Care
- Cyber-security
- Mobility and Transport
- Urbanization
- Internet Governance
- Poverty
- Hunger
- Failing states
- Child mortality
- Orphan diseases

(Grand challenges 21st century)

Need for resilience

D. Technology has to be an expression of our shared values

And we need to balance multiple values

Design for privacy

Design for security

Design for inclusion

Design for sustainability

Design for democracy

Design for safety

Design for transparency

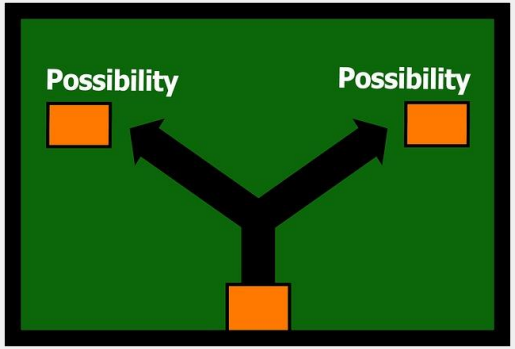
Design for accountability

Design for human capabilities

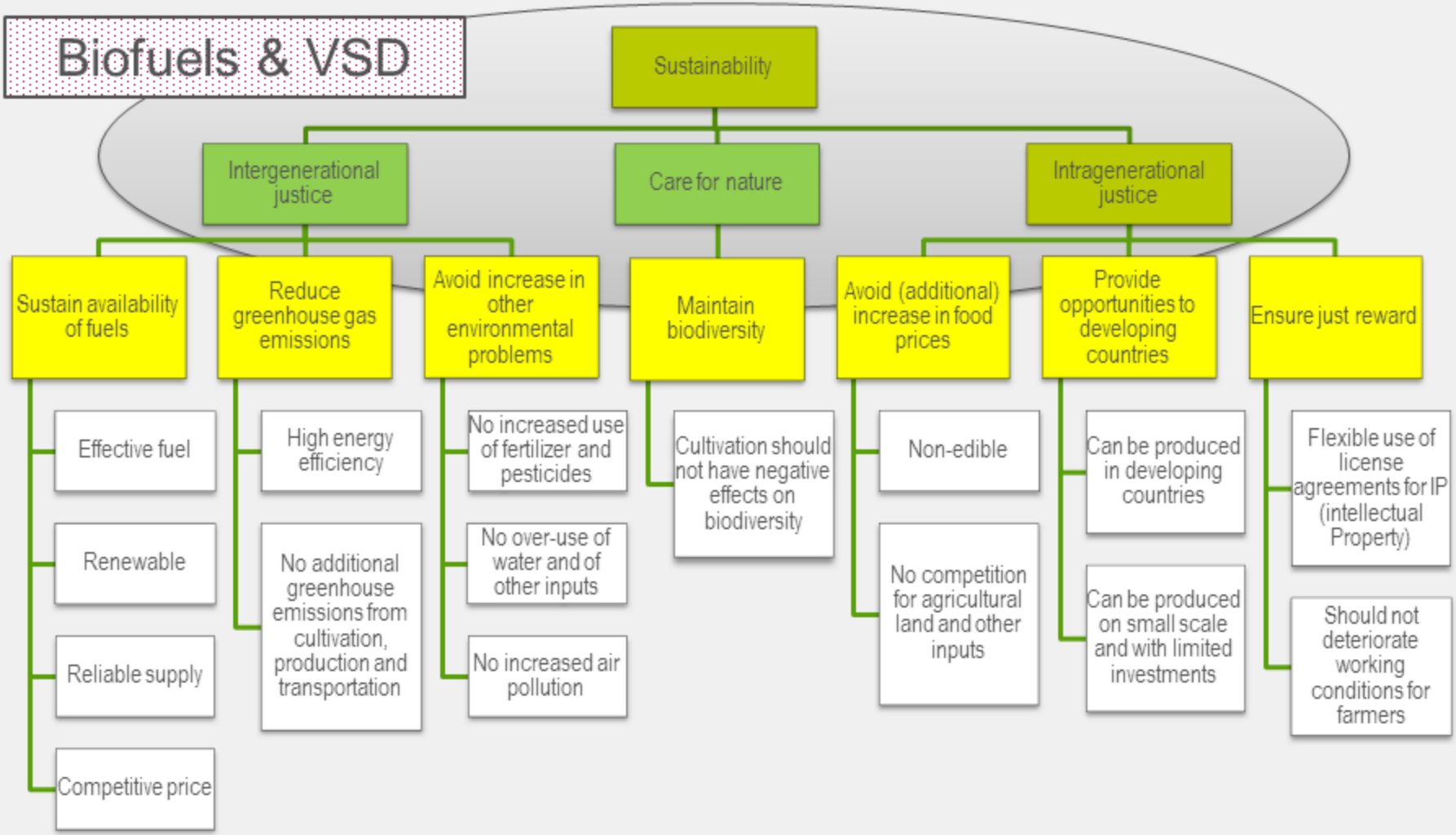
Obligation to look for the best solution on the basis of our moral values

E. We thus need creativity, new design methods, and to reflect on the management of innovation

- *Previously unknown design and functionality (physical, conceptual, institutional or combinations)*
- *Expand feasible options regarding solving a set of moral problems*



Biofuels & VSD



Brainstorm

ECOMATERIALS INNOVATION LAB
POP! TECH
GREEN TEXTILES
YANG
BAYER
KOSURI

GOOD

For discussion 1: ethical issues and dealing with (unknown) risks

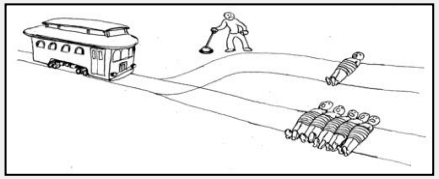
- *What does an engineer have to know about ethical issues?*
- *What does an engineer have to know about risks & anticipation of risks?*

Some food for thought:

Who is responsible in case of an accident with a self driving vehicle?

- **Driver as in the current case?**
- **Car manufacturer?**
- **Company providing sensors or the software?**
- **Road authority**?

Ethical concern: the ‘trolley’ problem



Accident unavoidable but AV has two options

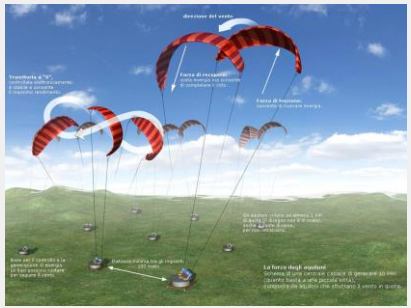
4 dead?

How to decide? Algorithms?

1 dead?

For discussion 2: Value sensitive design and entrepreneurship

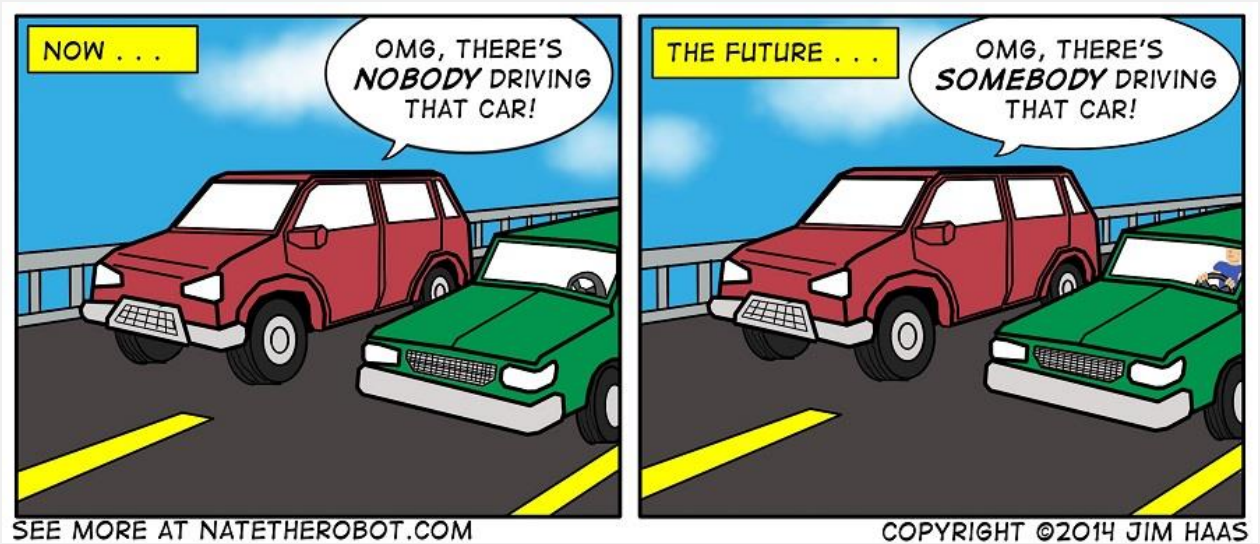
- *What does this all mean for teaching the design process?*
- *What does this mean for the way we pay attention to management of innovation and entrepreneurship?*
- *Cultural aspects?*



For discussion 3: Open education

- *In what way should we invest in joint open education?*
- *What should be our offer for professionals?*
- *Which topics/domains are most important?*

Final reflection: ethical issues and self driving vehicles



Thank you for your attention and contributions!