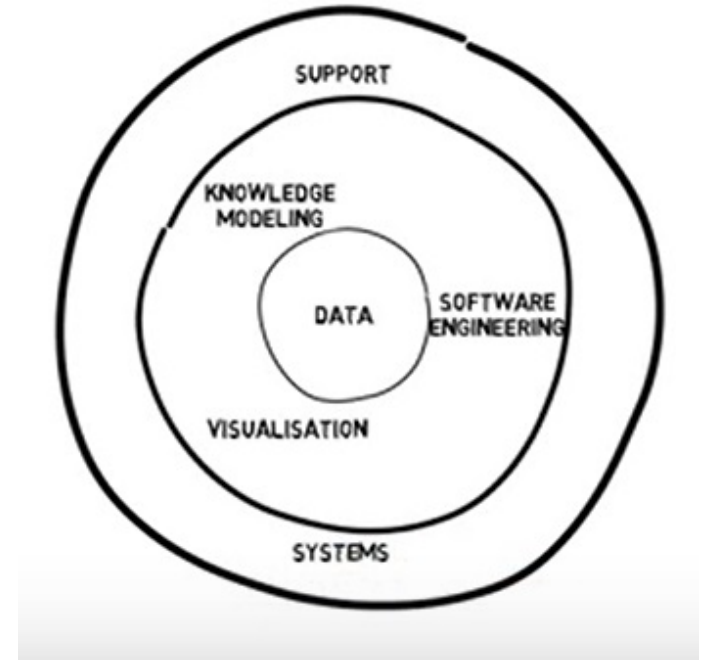


Data Intelligence in Education

dr. Roger Bemelmans, lector Data Intelligence

Zuyd University
of Applied Sciences **ZU
YD**

- Lectoraat DI
- Wat is Data Intelligence?
- Actuele ontwikkelingen
- Toekomstperspectief
- Soorten DI
- DI in education
- Workshop



Contexten:

- Zorg en welzijn
- Onderwijs
- Slimme woon-, leef- en werkomgeving

- 2 lectoren
- 1 hoogleraar
- 4 PhD-kandidaten
- 10 onderzoekers/ondersteuners

AI (DI) definitie

(Tegmark)

AI = A + I =

A (niet-biologisch) +

I (vermogen om doelstellingen te realiseren)



(Russell en Norvig)

Thinking Humanly “The exciting new effort to make computers think . . . <i>machines with minds</i> , in the full and literal sense.” (Haugeland, 1985) “[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning . . .” (Bellman, 1978)	Thinking Rationally “The study of mental faculties through the use of computational models.” (Charniak and McDermott, 1985) “The study of the computations that make it possible to perceive, reason, and act.” (Winston, 1992)
Acting Humanly “The art of creating machines that perform functions that require intelligence when performed by people.” (Kurzweil, 1990) “The study of how to make computers do things at which, at the moment, people are better.” (Rich and Knight, 1991)	Acting Rationally “Computational Intelligence is the study of the design of intelligent agents.” (Poole <i>et al.</i> , 1998) “AI . . . is concerned with intelligent behavior in artifacts.” (Nilsson, 1998)

Figure 1.1 Some definitions of artificial intelligence, organized into four categories.

Ontwikkelingen

Schaken, 1997, Deep Blue (IBM)

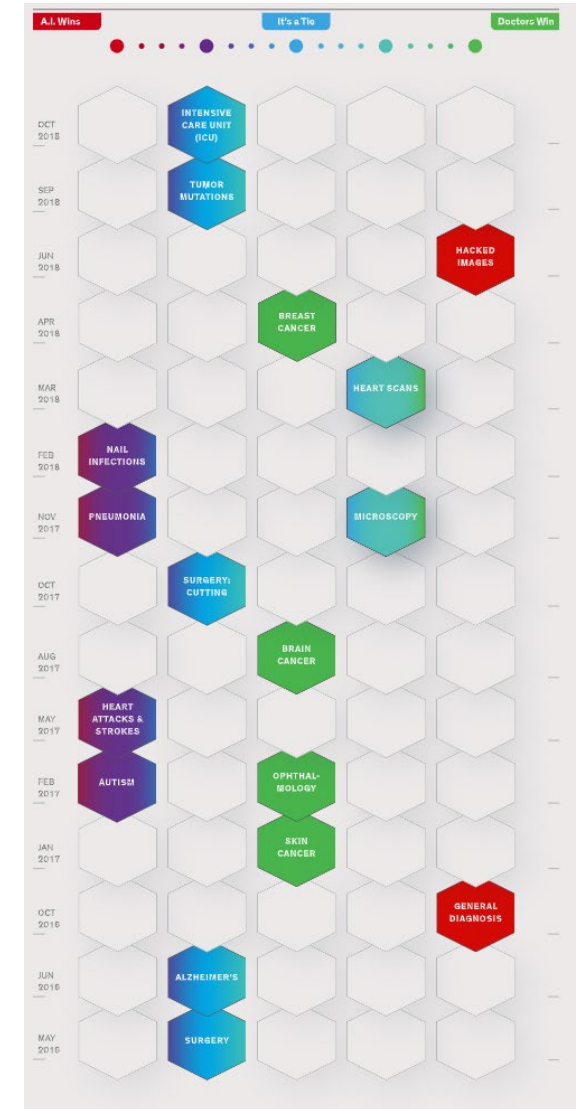
➤ Go, 2016, AlphaGo (Google)



Poker, 2016, DeepStack (Un Alberta)

AI vs Doctors

<https://spectrum.ieee.org/static/ai-vs-doctors>



Failures

AI World Cup 2018 predictions almost all wrong

Uber self-driving car kills pedestrian, 2018

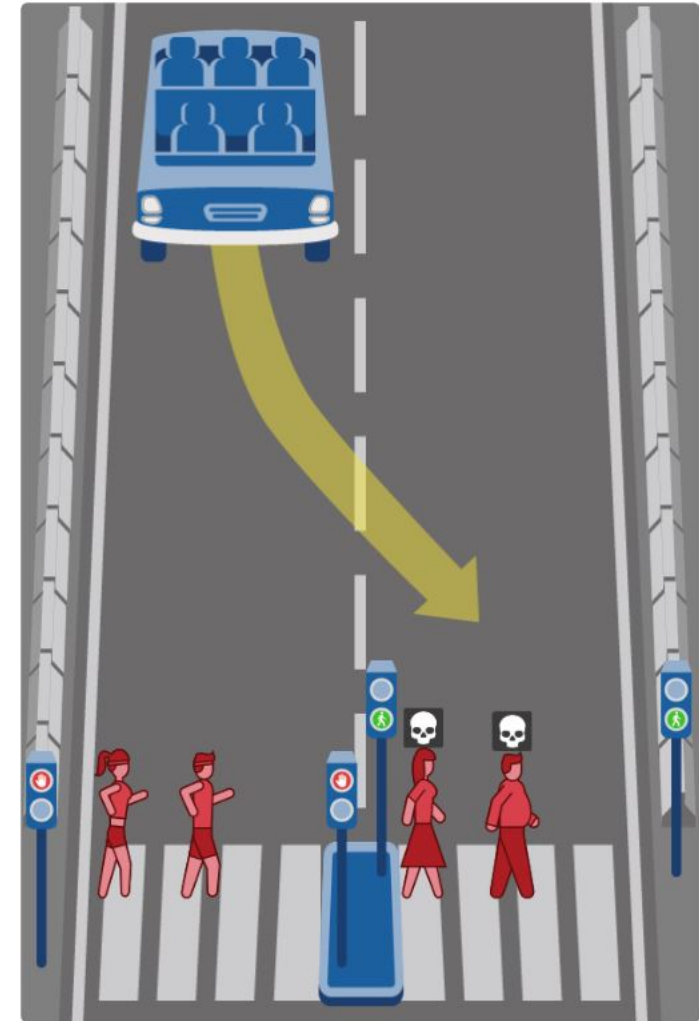
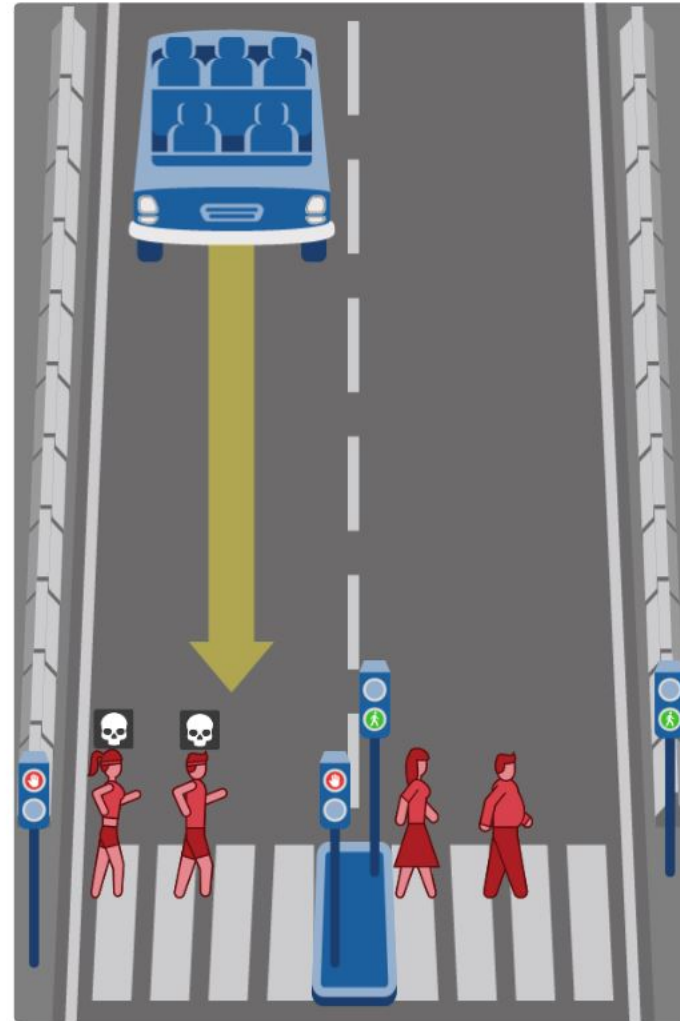
Microsoft Twitter chatbot Tay (2016)



Morele machines



What should the self-driving car do?



<http://moralmachine.mit.edu/>

Man versus machine: 9 human jobs that have been taken over by robots

Technology Has Already Taken Over 90% Of The Jobs Humans Used To Do

Oxford universiteit (2017):

Much of the technology disruption is yet to come

Verpleegkundigen	<1%
Onderwijzers	<1%
Accountant	95%
Boekhouder	98%
Telemarketeer	99%



Beroepen waarin machines (nu nog) slecht in zijn:

- **Onvoorspelbaarheid, Creativiteit, Sociale interactie**

Toekomst AI

Algemene Kunstmatige Intelligentie (AKI)

➤ *"De belangrijkste maatschappelijke discussie van deze tijd"*



AI Safety Conference (2015):

3 vragen centraal:

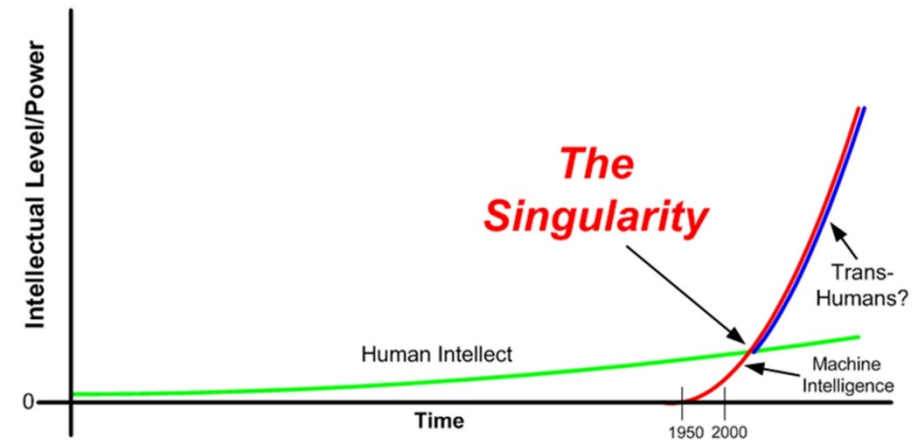
- Kan AKI?
- Wanneer AKI?
- Wat dan?

Kan AI?

- Geen natuurkundige belemmeringen (quarks en elektronen)!?

Wanneer AI?

2055-2075



(S)AKI

wat dan?

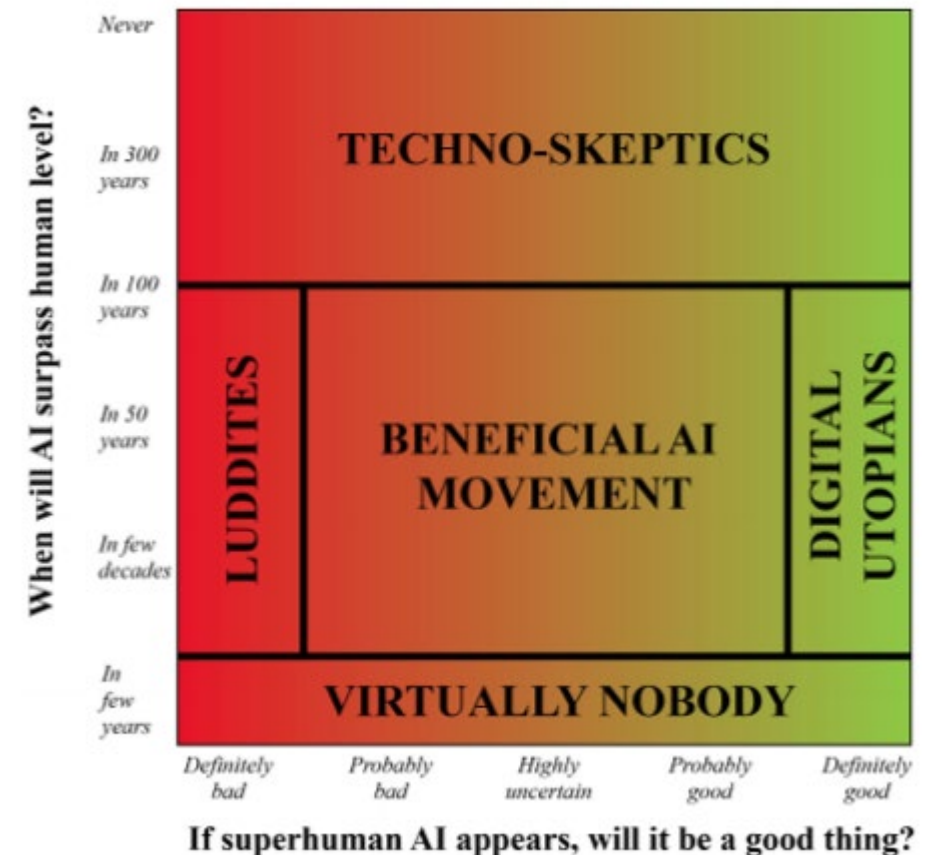
Nature, april 2016:
*"Machines and robots
that outperform
humans across the
board could self-
improve beyond our
control — and their
interests might not
align with ours."*

➤ Utopisten: Page, Kurzweil

Sceptici: Andrew Ng, Brooks

'Goedaardige KI': Einstein, Turing, Good, Hawking, Russel, Norvig,
Gates, Tegmark, Musk

Luddieten: Vinge



Data:

5V's: Volume, Velocity, Variety, Value and Veracity

ETL -> analytics -> reporting -> (real-time) support systems

FAIR data

Analytics:

- Descriptive (studierendement, uitvalpercentages)
- Predictive (individue: studieduur, struikelvakken)
- Diagnostic (waarom lage cijfers, lage aanwezigheid)
- Prescriptive (wat te doen: student, docent, management, ondersteuning)

Onvolledig

Cijfers (assessments stage, vakresultaten, studievoortgang)

Huiswerk

Formatieve en summatieve toetsen

Gedrag (docent, mentor; aanwezigheid, berisping, betrokkenheid,
interactie, zelfstandigheid)

Benchmarks

Demografisch, Sociaal-economisch

Vooropleiding

Gezondheid

Resources (geld, tijd, mensen, producten/diensten)

Real-time leeractiviteiten (workshop)

DI cultuur

Richtlijnen

Creëer data teams: draag DI-cultuur uit

Juiste tools voor data collectie (ETL en FAIR):
Volume, Velocity, Veracity

Faciliteer juiste analyses (analytics, reporting, support)

Gebruik meerdere databronnen:
Variety

Betrek alle stakeholders (student, docent, management, service):
Value

P2A -> A2P

Voorkom Bias (objectiviteit)
Borg transparantie in proces en resultaat analytics
Waarborg GDPR

Workshop

Design and analytics

Serious Game

drs. Marcel Schmitz

Hoofddocent en PhD-kandidaat Learning Analytics

Zuyd en OU

*Technology is giving life
the potential to flourish
like never before...*



*...or to self-destruct.
Let's make a difference!*

Dank jullie wel