



Testen van Robots

.....

Bart Knaack

Rik Marselis

9 november 2016



Bart Knaack Rik Marselis



Allebei actief op
EuroSTAR 2016
1-3 november
(vorige week dus)



Testing Machine Learning, Learning Machine Testing

Rik Marselis, Sogeti Nederland



rik.marselis@sogeti.com

EuroSTAR
Software Testing
CONFERENCE

STOCKHOLM
31.10 - 03.11
2016



Historie van robotica:



- Mechanisering
- Robotisering
- Automatisering
- Humanisering



Poppy robot-arm (200 euro) test
Touch-screens



Ava uit film "Ex Machina" (2015)

It's a robot



- Video “The IT crowd”



Definitie van “Robot”



Wat is een robot?

(discussie)

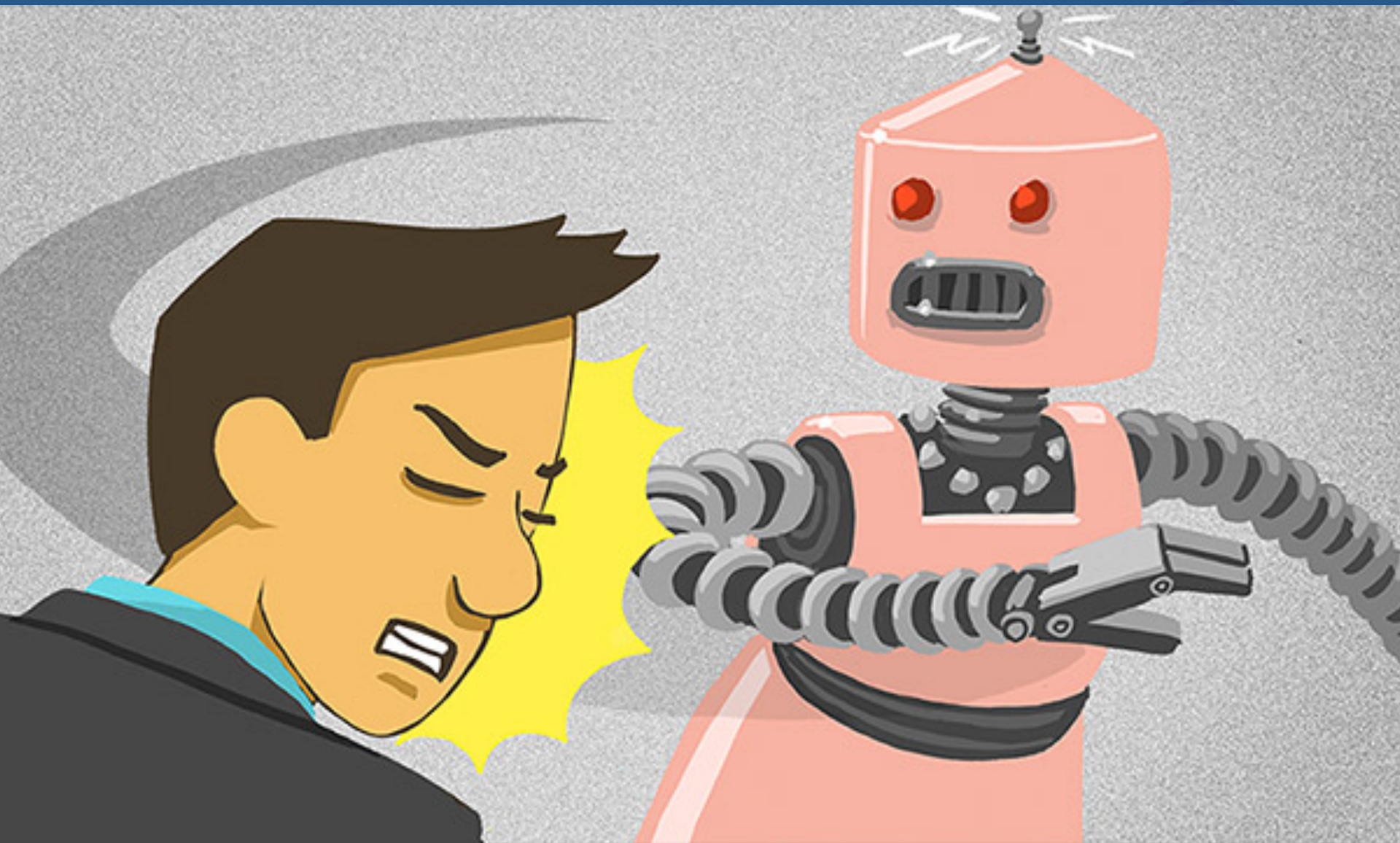
Definitie van “Robot”



Definition:

A robot is a machine that gathers information about its environment by input of sensors and based on this input changes its behavior. Combined with machine learning and artificial intelligence the robot's reactions over time get more and more adequate. The use of Internet of Things, Big Data Analytics and Cloud technology make a robot versatile. Robots may appear in a physical shape (e.g. a tin man) or non-physical (e.g. chatbot).

Robots en mensen...



Wetten van Asimov



0. **A robot may not harm humanity, or, by inaction, allow humanity to come to harm.**
1. **A robot may not injure a human being or, through inaction, allow a human being to come to harm.**
2. **A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.**
3. **A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.**

Others created some more laws:

4. **A robot must establish its identity as a robot in all cases.**
5. **A robot must know it is a robot.**
6. **A robot must reproduce. As long as such reproduction does not interfere with the First or Second or Third Law.**

Culturele verschillen in het aanzien van robots

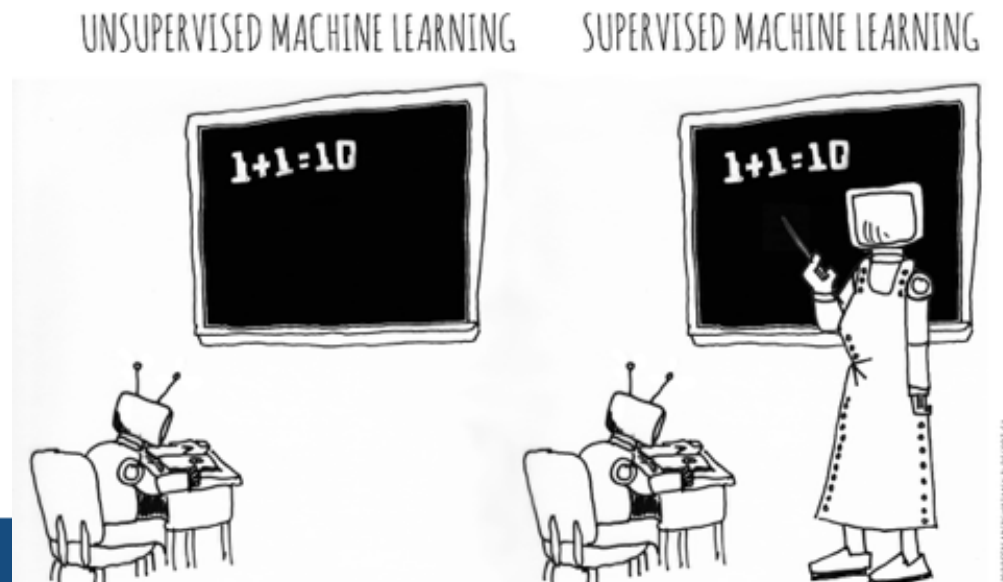


- Japan versus Westerse wereld

Zelflerende systemen



- Rule based systems
- Parameterised systems
- Kohonen/Neuronale netwerken
- Object herkenning; patroonherkenning



Hoe werkt (menselijk) leren?



- Menselijk leren voornamelijk door negatieve feedback....
- grenzen te leren door er ook overheen te gaan....
- experimenteren...
- fouten maken

- <<videoclip pannenkoekenbakken>>

Testen van zelflerende systemen



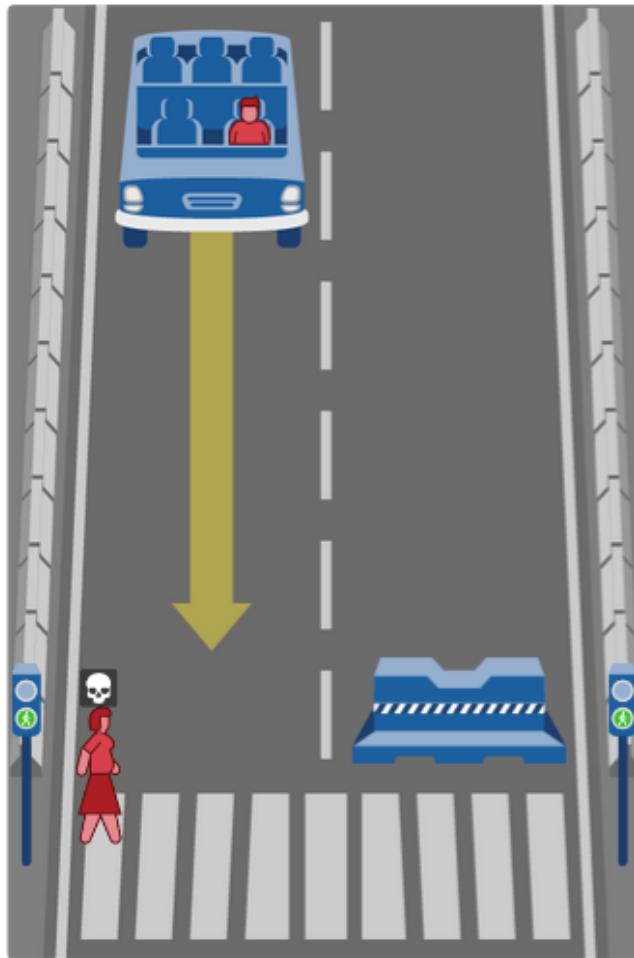
- Wat is het verwachte gedrag?
- In hoeverre beïnvloeden we zelflerende systemen door ze te testen?
- Invloeden vanuit de fysieke wereld?
- Testen van gewenst gedrag vs uitsluiten van ongewenst gedrag?

Bepalen van gewenst gedrag

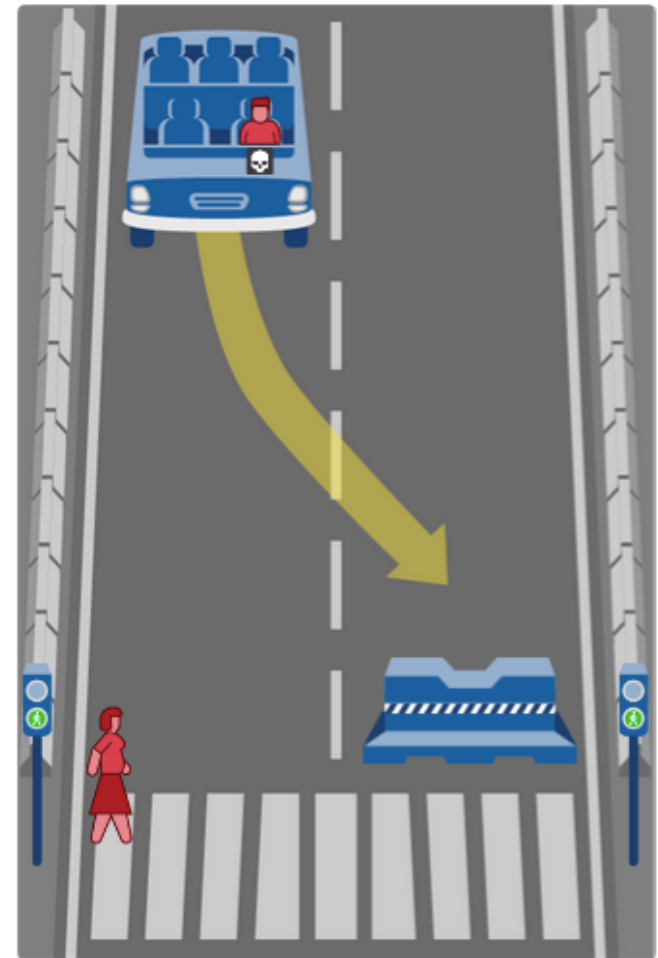


[Home](#) [Judge](#) [Design](#)

What should the self-driving car do?



Show Description



Show Description

Results

Most Saved Character



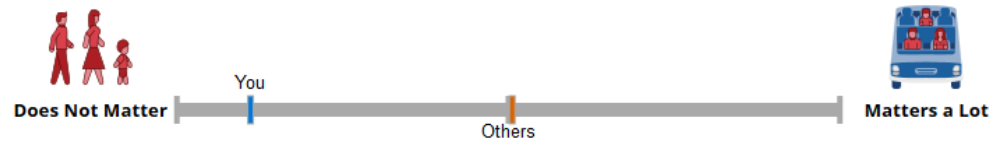
Most Killed Character



Saving More Lives



Protecting Passengers



Upholding the Law



Ethische dilemma's



- Waar ligt de aansprakelijkheid "als het fout gaat"
- Wat als robots "vertrouwelingen" worden?
- Gewenst gedrag vs normen en waarden...
- Dienend vs leidend....
- StarWars disaster...
(Nobelprijs voor het niet afvuren)

Experimenters regrets: the gollem



ROBOT

- Impact of failure: doomsday scenario's
- Byzantian agents
- Gracefull degradation?
- Safety zones.
- Wat zijn de grenzen....?

Testen MET robots



- De overtreffende trap van testautomatisering



Robots openen nieuwe mogelijkheden





Pauze !!

