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The array
of independent IT Lawyers

Avv. Giovanni Battista Gallus
LL.M. Ph.d. ISO 27001 Lead Auditor
gallus@array.eu - gallus@gm-lex.eu

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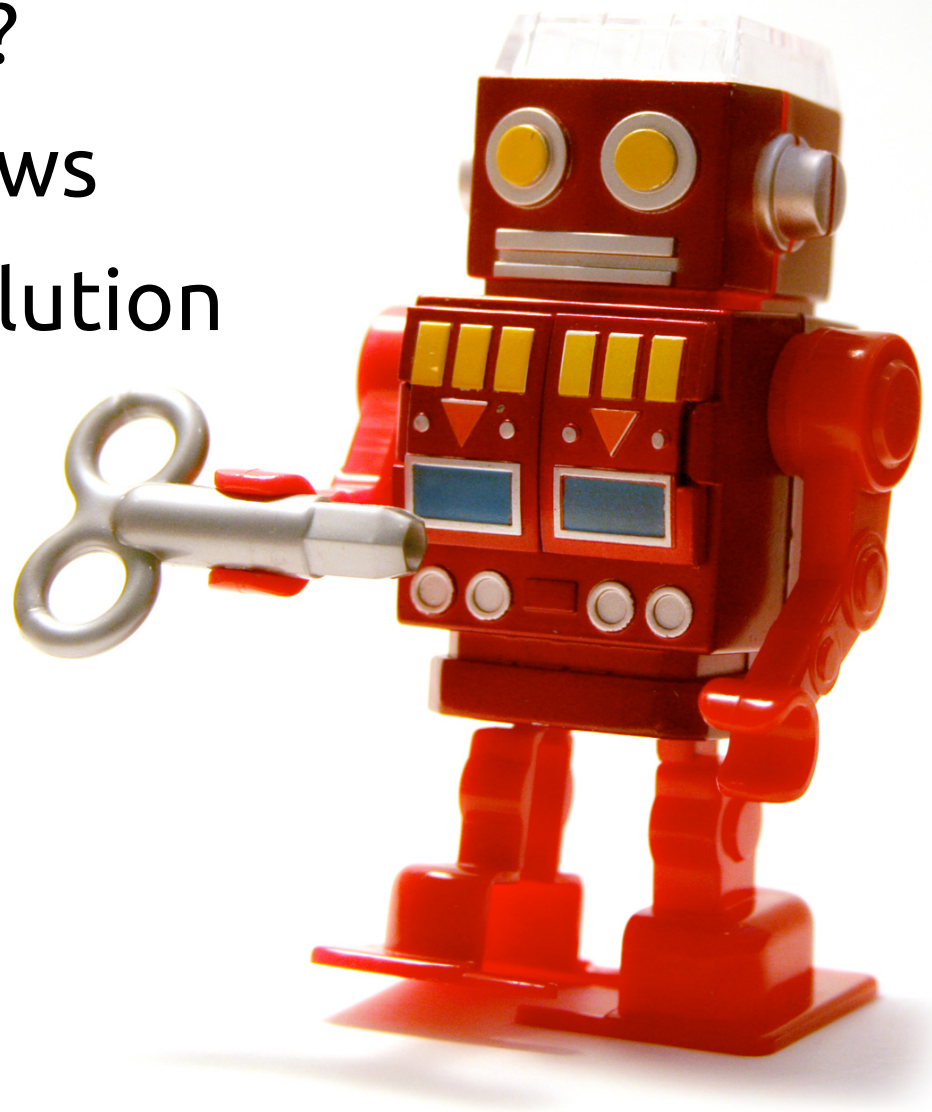
- A Robolaw for all robots?
- “Hard” laws and “soft” laws
- Overview of the Eu Resolution on robots
  - Civil liabilities
  - Autonomous veihicles
  - Ethical issues

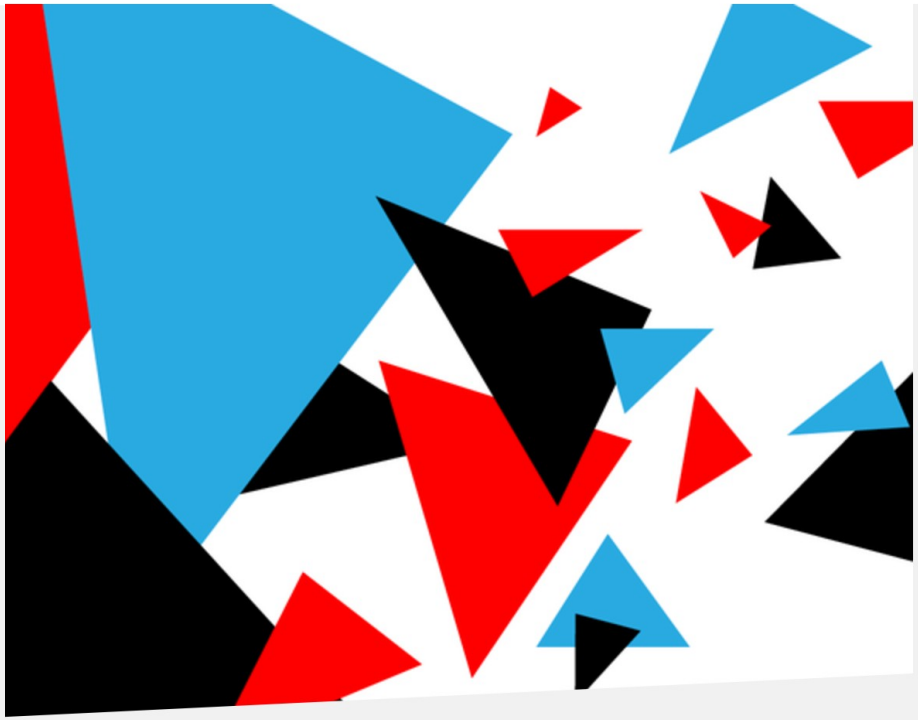


The 2017 Vienna Biennale

Opening VIENNA BIENNALE 2017
Robots. Work. Our Future

MAK / Exhibitions

Hello, Robot.
Design between Human and Machine
Hello, Robot. Design between Human and Machine will take a look at how robotics is entering our everyday lives and show the decisive role played by design.
more / show on Map



The *VIENNA BIENNALE 2017: Robots. Work. Our Future* focuses on the potential of art, design, and architecture to contribute to an environmentally and socially sustainable concept of the digital age that is also committed to a new humanism. At various exhibition venues across the entire city, the *VIENNA BIENNALE 2017* brings together some 300 designers, architects, artists, and other participants who draw a complex picture of our future

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From 1980

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To 2017

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DARPA's ALIAS successfully lands a Boeing 737 simulator

21-May-2017 02:25 EDT

A specialist flies a Boeing 737-800NG simulator with Aurora's ALIAS technology demonstration system as his co-pilot, the latest in a series of accomplishments for ALIAS system testing.

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Grade

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From Avatar

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To reality

SUITX

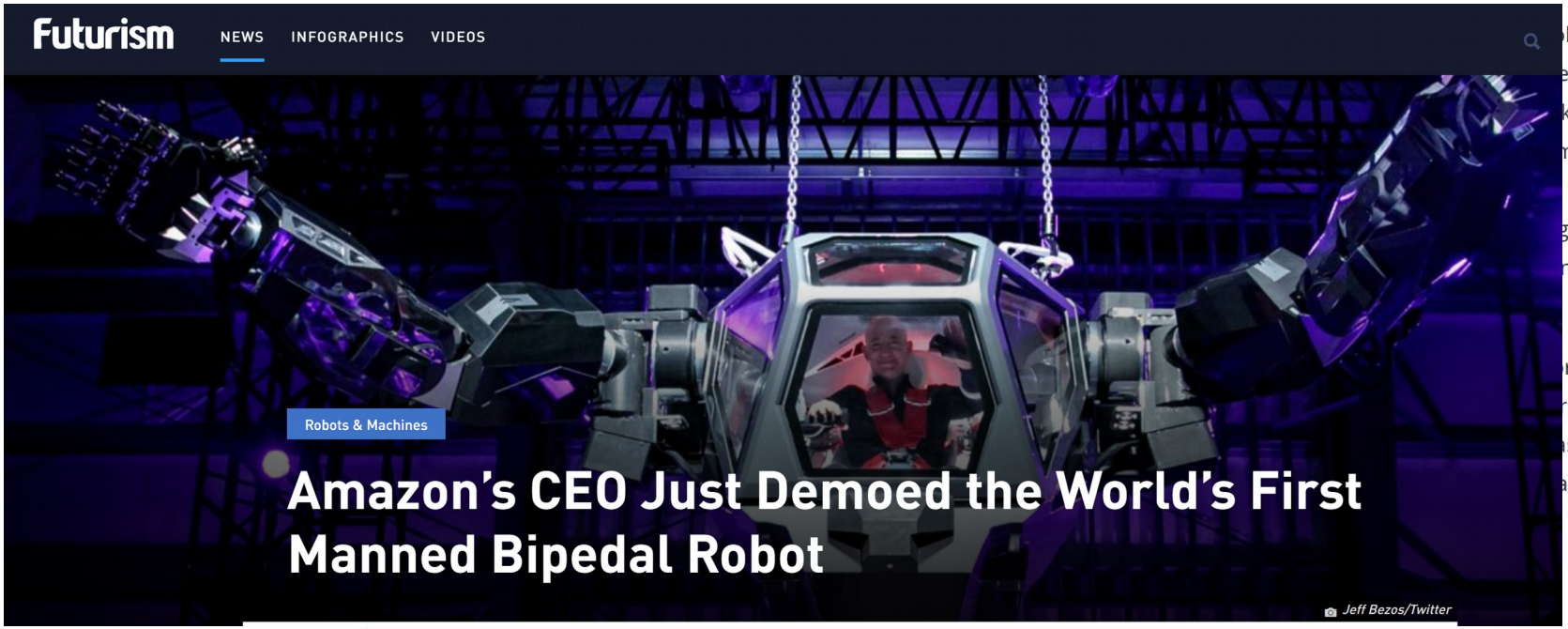
HOME BECOME A PHOENIX TEST PILOT PRODUCTS

MAX (Modular Agile eXoskeleton)

A Modular, Full-Body Exoskeleton for Reducing Forces at the Back, Shoulder, and Knee

lution that can be adapted
e system that can allow
ks with reduced injury risk
mposed of three exoskeleton
independently and in any
ge when you need them, and
nd ladders, driving, and

rt baggage handling sites in
ratory evaluations on MAX at
s much as 60 percent. MAX
nding ergonomic features



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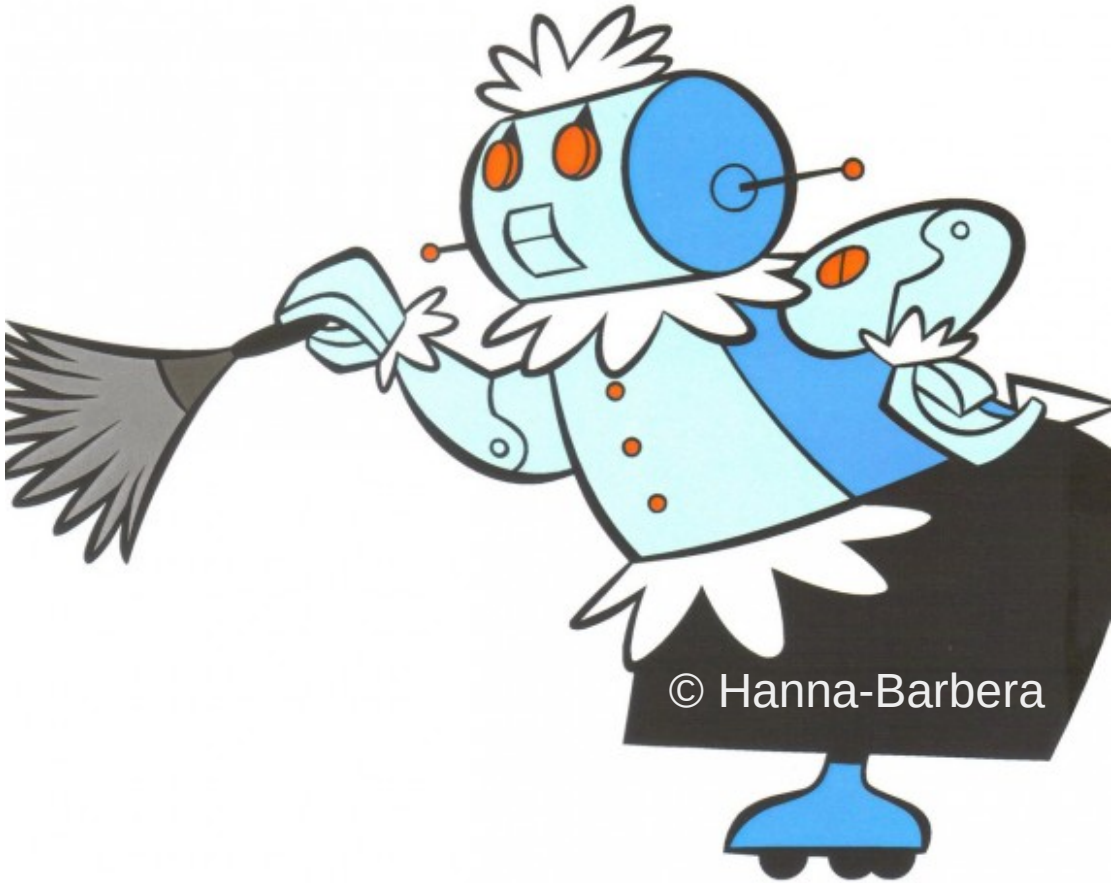
From the Jetsons



To our homes and nursing homes

RNZ Home News Radio Series & Podcasts Topics Pacific

Japan turns to robot care as population ages

4:39 pm on 26 May 2017

Share this

Philippa Tolley, Insight Executive Producer
@nzpjt philippa.tolley@radionz.co.nz

A high pitched, child-like voice floats up the corridor as you step out of the lift at Shintomi Rest Hon

It is recreation time and the residents are singing along to an action song led by Pepper the robot.

Pepper the robot in full flow. Photo: RNZ / Philippa Tolley

European Commission › Strategy › Digital Single Market ›

Digital Single Market

EU-funded research into robotics for ageing well

Service and care robots could play a supportive role in the life of many chronic patients and elder people who want to live independently for more years. The European Commission funds research, innovation and development activities for service robotics in what is called assisted living environments made of advanced ICT solutions such as sensors.

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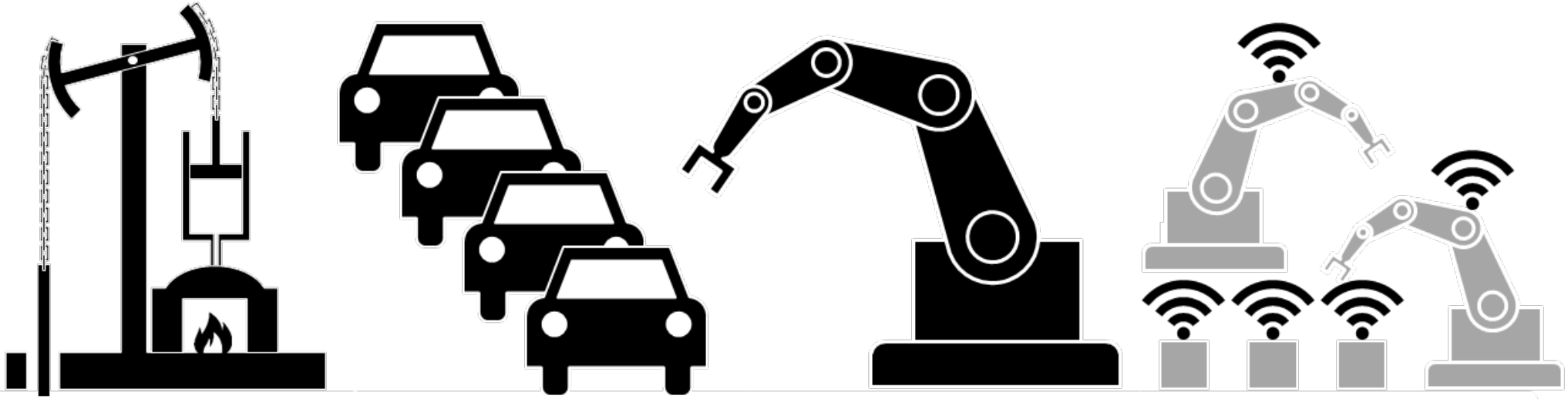
Industry 4.0



1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

By ChristophRoser at http://www.allaboutlean.com AllAboutLean.com
Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=47640595

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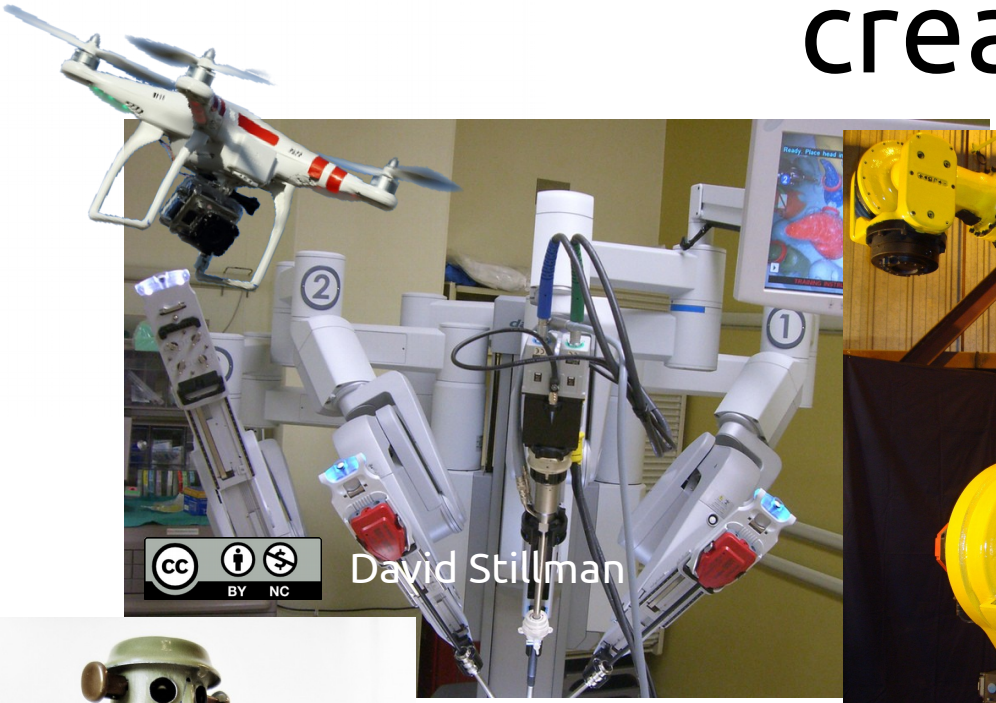
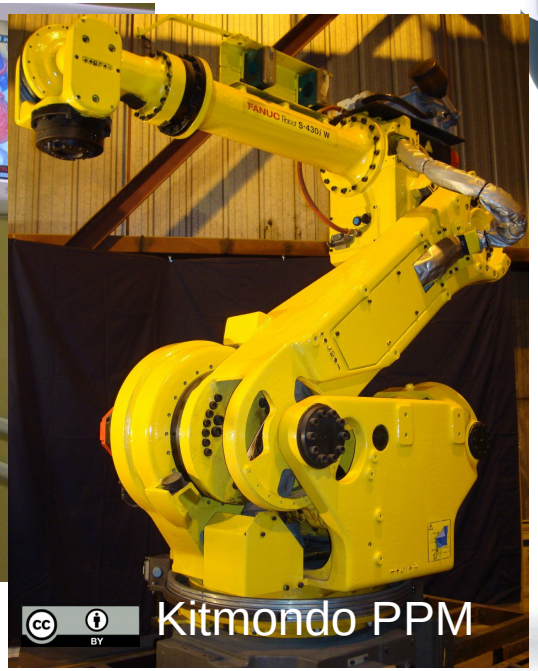
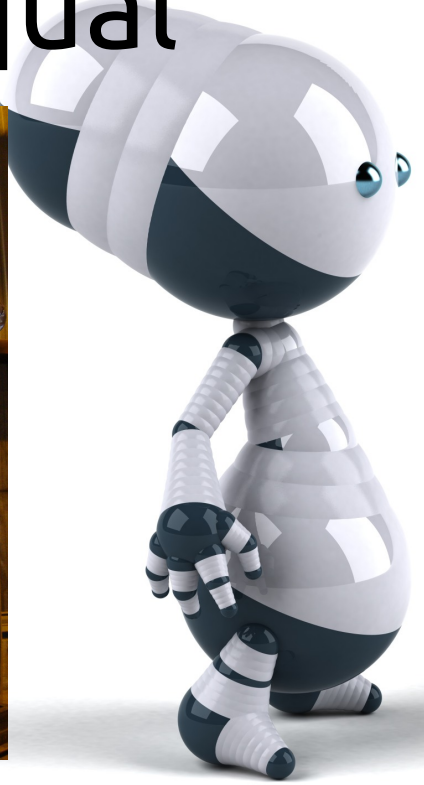
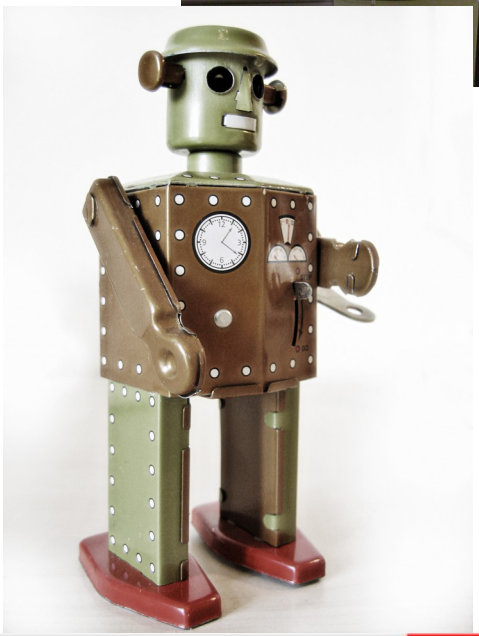
All ~~men~~ robots are **not** created equal









"The term robot is a-technical and encompasses a wide range of applications that have very little in common. For this very reason, **it is impossible to develop a unitary body of rules applicable to all kinds of robotic applications**, rather different rules should apply to different classes of devices"

A. Bertolini

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“Smart Robot” definition

- The acquisition of autonomy through sensors and/or by exchanging data with its environment (inter-connectivity) and the trading and analysing of those data;
- self-learning from experience and by interaction (optional criterion);
- at least a minor physical support;
- the adaptation of its behaviour and actions to the environment;
- absence of life in the biological sense

European Parliament resolution of 16 February 2017

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Question time!

- Which among the following legal statuses is closer, at the present time, to the one applicable to smart robots?

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Digital person?

https://en.wikipedia.org/w/index.php?curid=12543502

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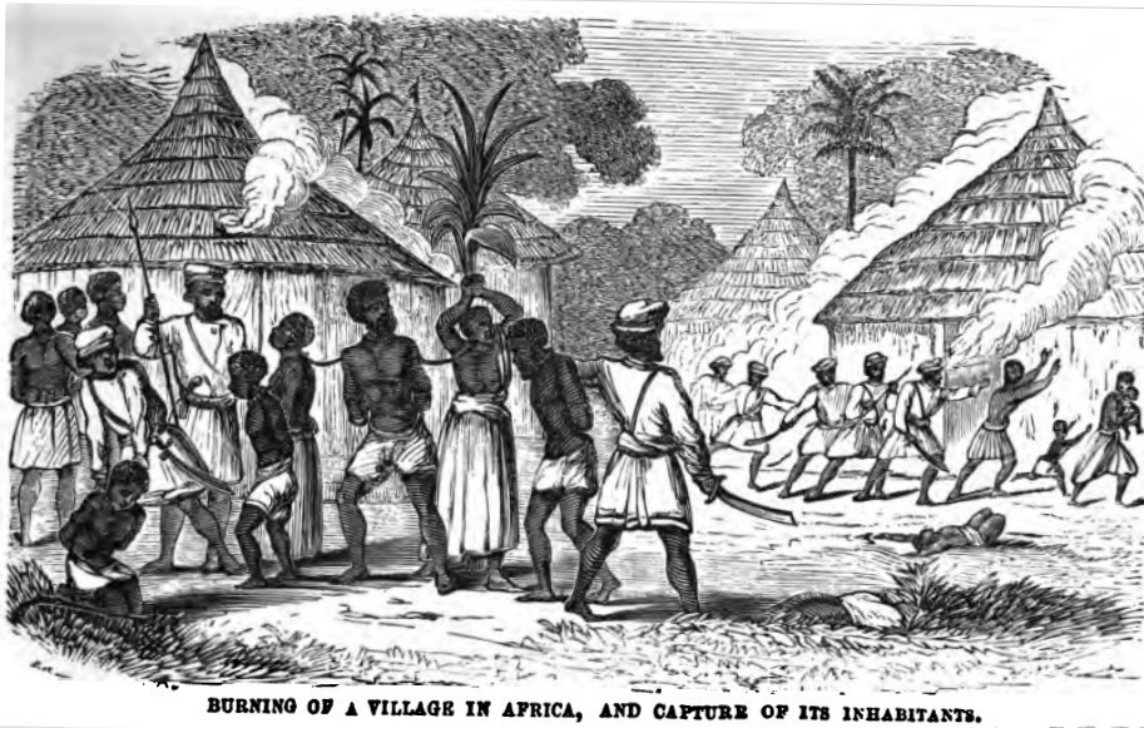
Slave?



BURNING OF A VILLAGE IN AFRICA, AND CAPTURE OF ITS INHABITANTS.

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Pet/animal?

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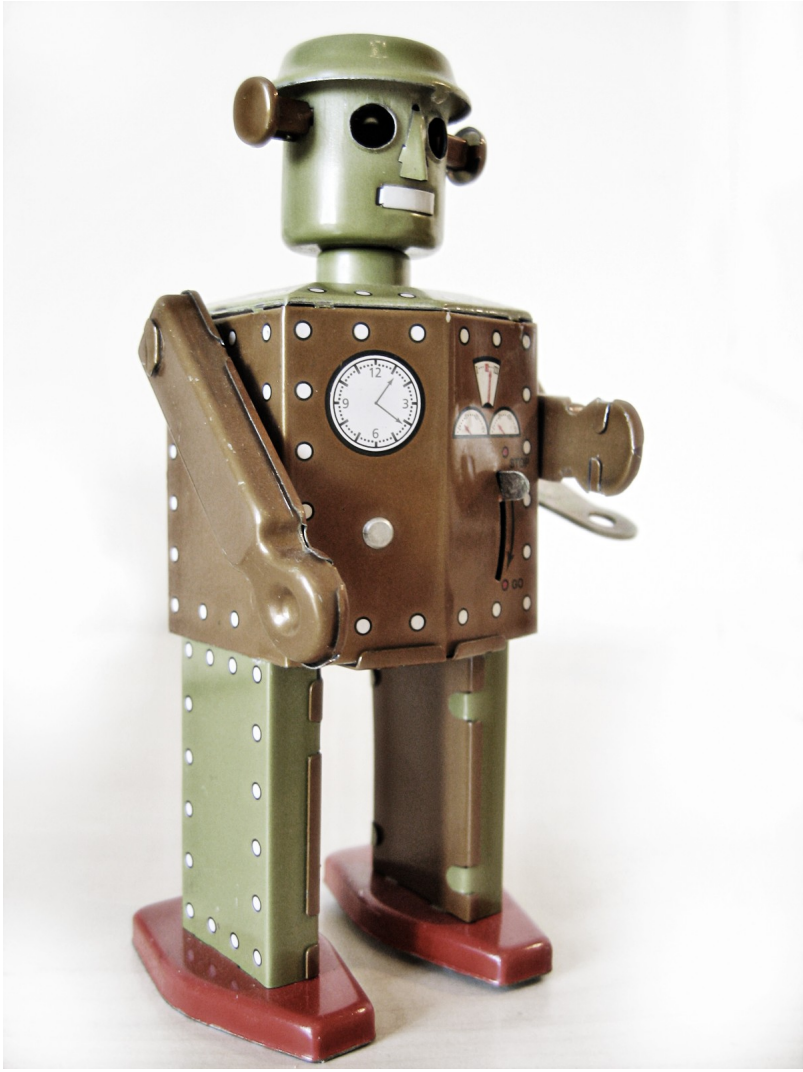
Children/minor?



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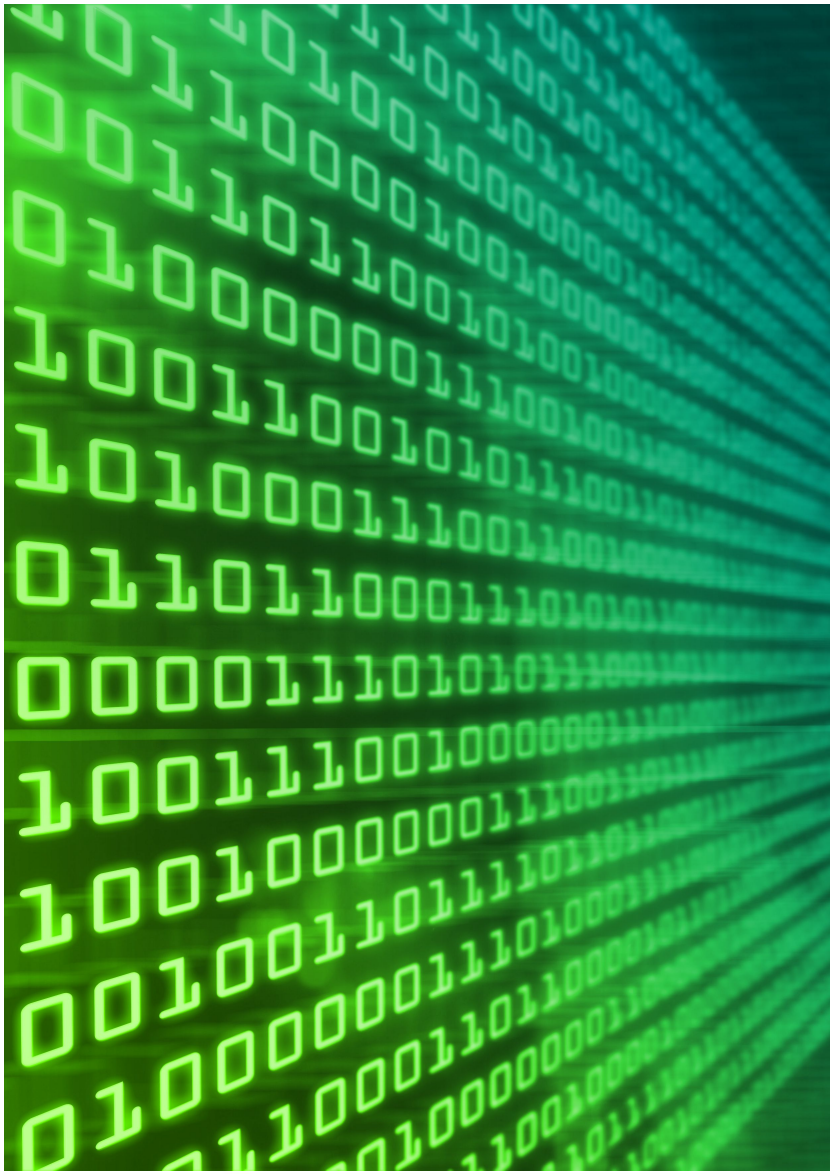
Software?



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Tool (machine – car – manufactured object)?

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Hard laws

- Directive 85/374/EEC on liability for defective products
- Machinery Directive 2006/42/EC
- Council Directive 89/391/EEC of 12 June 1989on safety and health at work
- Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices
- EU Regulation 2016/679 (GDPR)
- Future EU Regulation on Drones (Notice of Proposed Amendment 2017-05 (A)- Introduction of a regulatory framework for the operation of drones)
- Convention on damage caused by foreign aircraft to third parties on the surface, 7 October 1952
- Several Conventions regarding international civil liabilities (nuclear power; dangerous and noxious substances; oil pollution etc)
- **The hardest part: all national laws regulating civil and criminal liability for harmful acts**

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Soft Laws

- European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics
  - Charter on Robotics
    - CODE OF ETHICAL CONDUCT FOR ROBOTICS ENGINEERS
- European Parliament's resolution of 29 October 2015 on safe use of remotely piloted aircraft systems
- Opinion 1/2015 on Privacy and Data Protection Issues relating to the Utilisation of Drones
- 2015 Riga Declaration on remotely piloted aircraft (drones)
- All relevant technical standards (ISO/TC 299 -Robotics and others)

Robots and artificial intelligence: MEPs call for EU-wide liability rules

Press Releases PLENARY SESSION 16-02-2017 - 13:09

As human-robot interactions become commonplace, MEPs stress that EU-wide rules are needed to guarantee a standard level of safety and security.© AP Images/European Union - EP

EU-wide rules are needed for the fast-evolving field of robotics, e.g. to enforce ethical standards or establish liability for accidents involving driverless cars, say MEPs in a resolution voted on Thursday.

Interview with rapporteur

> Rise of the robots: Mady Delvaux on why their use should be regulated

Further information

> Adopted text (2015/2103(INL)) will soon be available here (16.2.2017)

> Video recording of debate (click on 15.2.2017)

> Video of the press conference

> EbS+ (16.2.2017)

> Public consultation on Robotics

Ada europe 2017
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European Parliament

2014-2019

TEXTS ADOPTED

Provisional edition

P8_TA-PROV(2017)0051

Civil Law Rules on Robotics

European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL))

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We must accept liability

The trend towards automation requires that those involved in the development and commercialisation of AI applications build in security and ethics at the outset, thereby recognizing that **they must be prepared to accept legal liability for the quality of the technology they produce**

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Control and verification

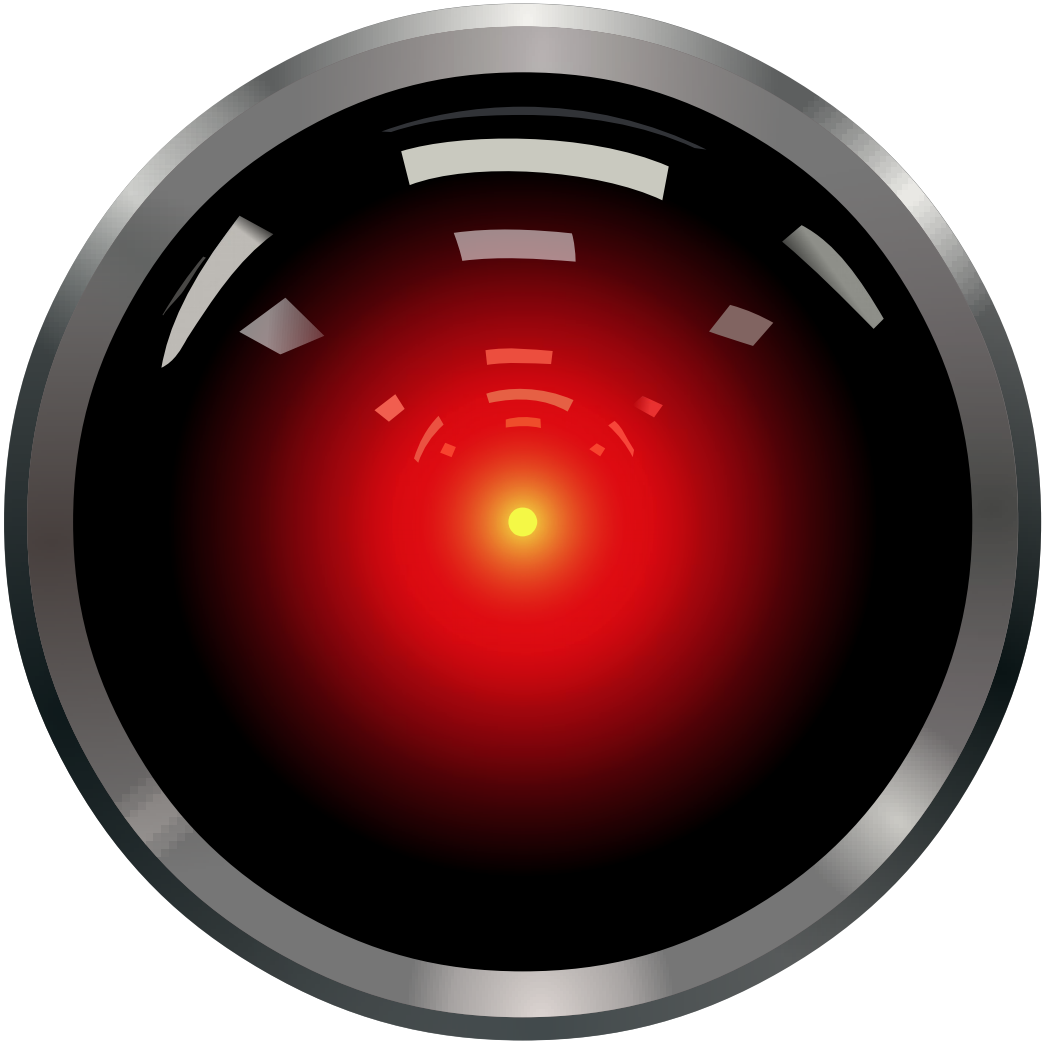
Safeguards and the possibility of **human control** and **verification** need to **be built into the process of automated and algorithmic decision-making**

Recommendations - general

- Compulsory registration
- EU Agency for Robotics and Artificial Intelligence
- Attention to emotional connection between humans and robots

Recommendations - general

- “Kill switch”
  (sorry, HAL 9000)



Cryteria
https://commons.wikimedia.org/w/index.php?curid=11651154

Recommendations – research & innovation

- Open science and responsible ethical innovation
- Interoperability between systems, devices and cloud services, based on security and privacy by design
- Open environment, from open standards and innovative licensing models, to open platforms and transparency, in order to avoid lock-in in proprietary systems that restrain interoperability

Recommendations – Ethical principles I

- Human safety, health and security; freedom, privacy, integrity and dignity; self-determination and non-discrimination; personal data protection
- **Strict and efficient guiding ethical framework for the development, design, production, use and modification of robots**

Whose ethics rule?

The beginning of ‘policy’ for robotics is that agents have to **act ethically right** and **maximise good consequences**.

The main value issues seem to concern **honesty**, esp. **nondeception of users and customers**.

euRobotics Topics Group
Ethical, Legal and Socio-economic Issues in Robotics

POLITICO

LATEST: Theresa May confirms Brexit negotiations to start this

Muslims have a unique responsibility in fighting terror

How to watch the French parliamentary election like a pro

Ex-fighters get band back together for Kosovo election

How Theresa May lost it

Theres Brexit start th

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Illustration by Paul Blow for POLITICO

SPECIAL REPORT

Should a driverless car kill the kid or the retiree?

Engineers and philosophers grapple with the ethical implications of self-driving vehicles.

By **JACOPO BARIGAZZI** | 10/18/16, 6:45 PM CET | Updated 10/23/16, 4:03 PM CET

Recommendations – Ethical principles II

- Transparency
  - it must always be possible to reduce the AI system´s computations to a form comprehensible by humans;
  - advanced robots should be equipped with a 'black box' which records data on every transaction carried out by the machine, including the logic that contributed to its decisions
- Guiding ethical framework should be based on the principles of beneficence, non-maleficence, autonomy and justice, on the principles and values enshrined in Article 2 of the Treaty on European Union and in the Charter of Fundamental Rights
- Special attention should be paid to robots that represent a significant threat to confidentiality owing to their placement in traditionally protected and private spheres

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And now...

X RATED MATERIAL

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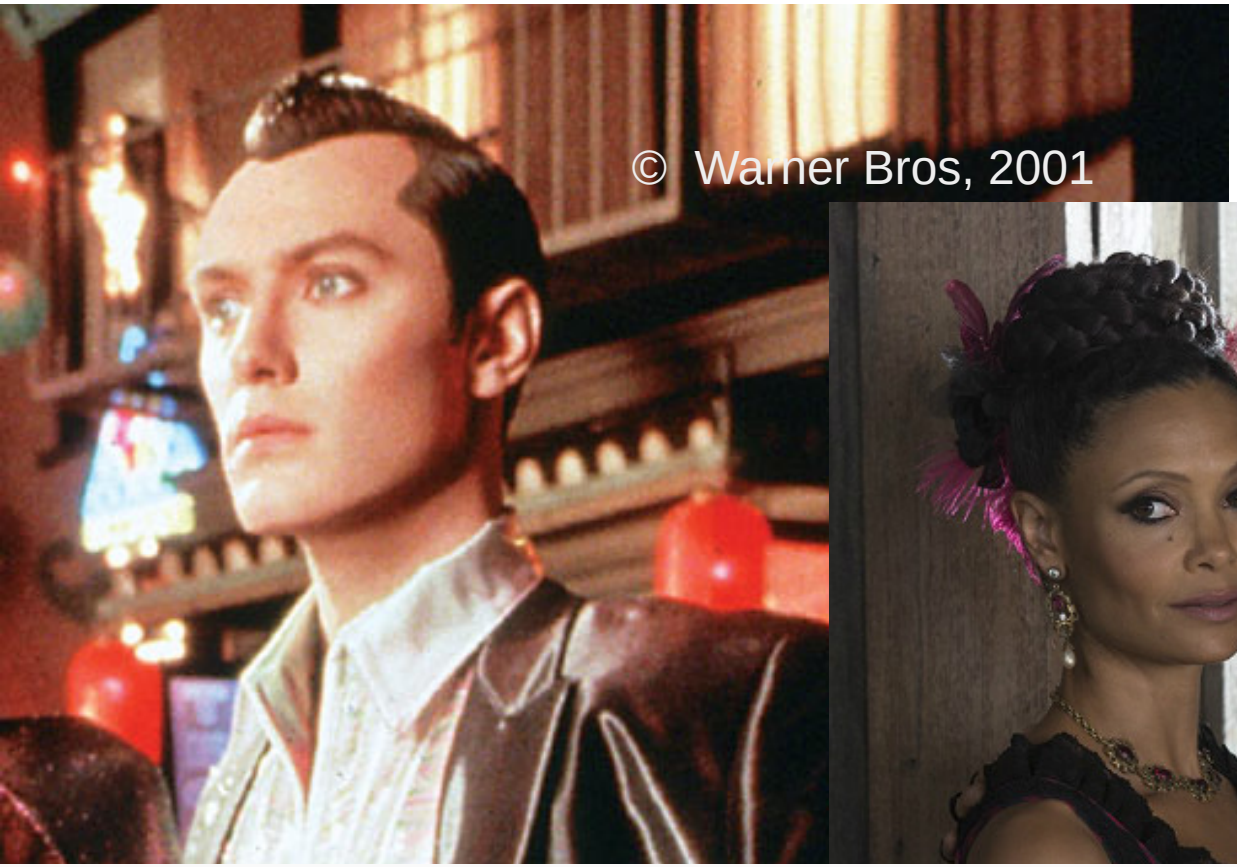
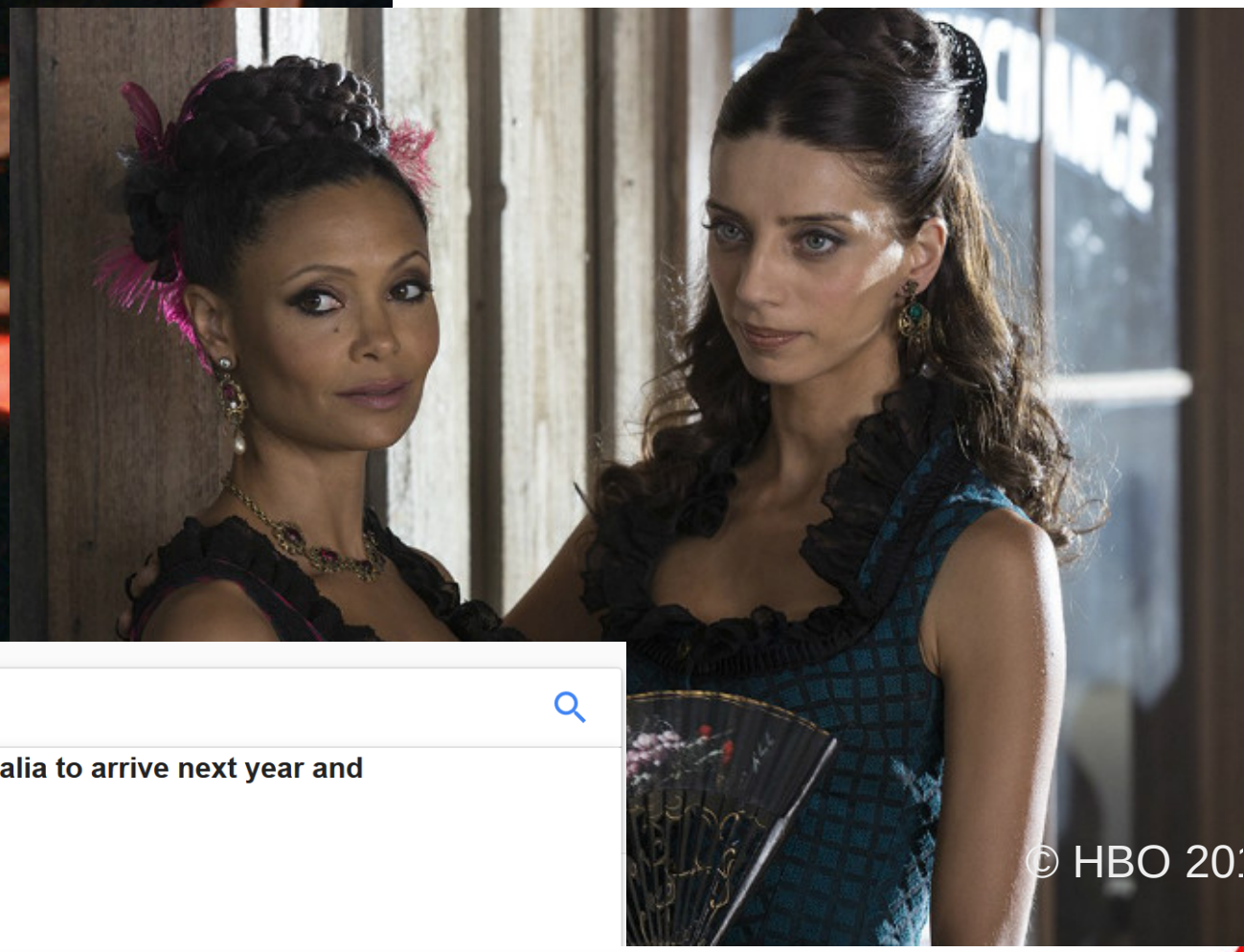
Roboprostitution





Google

sex robots

sex robots **with fully functional genitalia to arrive next year and will cost up to £12 000**
sex robots
sex robots **for sale**
sex robots **2015**

Recommendations – IP & flow of data

- Intellectual Property
- Compliance with the principles of GDPR
  - right to respect for private life and to the protection of personal data
  - High level of security
    - Responsibility of designers of robotics and AI to develop **products to be safe, secure and fit for purpose**

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Data protection & robots

https://www.flickr.com/photos/pallina60loon/

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EU Regulation 2016/679

Data protection by design

Transparency

Data protection by default

Data Protection Impact assessment

Necessity & proportionality

Certification mechanism

Recommendations – Standards safety and security

- International harmonisation of technical standards
- Lawful reverse-engineering and open standards
- Setting up of special technical committees, such as ISO/TC 299 Robotics
- Efficient strategy & monitoring mechanism for testing robots in real-life scenarios

Recommendations – Autonomous means of transport

- Urgent need for global rules
- Drivers reaction time (human factor)
- Drones

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Robohub news views talk learn

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VENTURER driverless car project publishes results of first trials

by UWE Bristol

Automotive News June 5, 2017

"A key finding is that it took 2-3 seconds for participants to 'takeover' manual controls and resume active driving after short periods of autonomous driving in urban environments"

VENTURER is the first Connected and Autonomous Vehicle project to start in the UK. The results of VENTURER preliminary trials show that the handover process is a safety critical issue in the development of Autonomous Vehicles (AVs).

The first VENTURER trials set out to investigate 'takeover' (time taken to reengage with vehicle controls) and 'handover' (time taken to regain a baseline/normal level of driving behaviour and performance) when switching frequently between automated and manual driving modes within urban and extra-urban settings. This trial is believed to be the first to

http://www.venturer-cars.com/trial-1-results/

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fallback Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
***Human driver* monitors the driving environment**						
0	**No Automation**	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	**Driver Assistance**	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	**Partial Automation**	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
***Automated driving system* ("system") monitors the driving environment**						
3	**Conditional Automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	**High Automation**	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes
5	**Full Automation**	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

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Press Releases

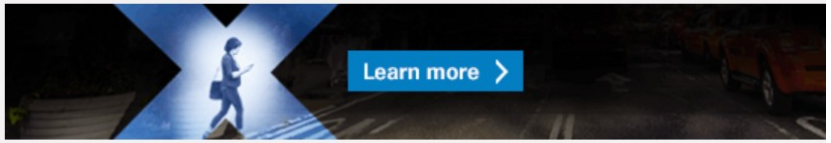
Automotive industry welcomes new legal framework for automated driving

Berlin, 12 May 2017

Federal Council votes to amend German Road Traffic Act

Automotive News Europe

Use 'and','or' b



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EUROPE | SAFETY AND REGULATION

German industry welcomes self-driving vehicles law

VW CEO Matthias Mueller expects driverless cars based on the Sedric concept to arrive at the beginning of the next decade.

Photo credit: Volkswagen

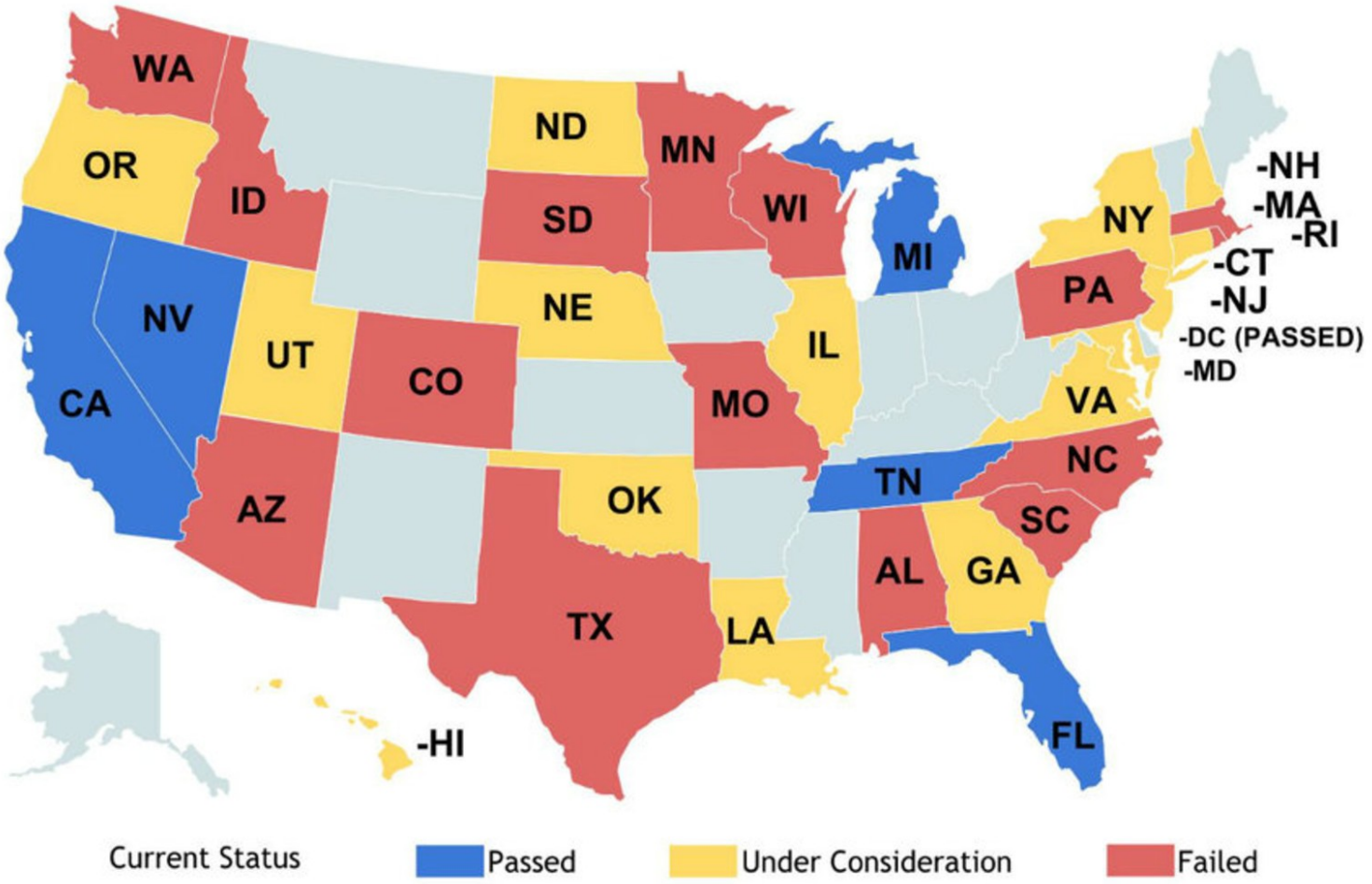
Print | Reprints | Respond | Recommend 31

Christiaan Hetzner
Automotive News Europe

May 15, 2017 11:11 CET

FRANKFURT -- Germany's auto industry praised its government as the first worldwide to broadly legalize self-driving cars, while cautioning that this was just an initial, but crucial, step in rolling out the technology on roads across the country.

On the other side of the pond



Legislatures in the following states are considering or have considered bills related to automated driving.

http://cyberlaw.stanford.edu/wiki/index.php/Automated_Driving:_Legislative_and_Regulatory_Action

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Volvo says it will accept "full liability" when its cars are operating autonomously

by Brad Templeton, Robocars.com

Automotive News October 8, 2015

In a statement released yesterday, Volvo said it would accept full liability whenever one of its cars is in autonomous mode.

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The (near) future for drones

European Aviation Safety Agency

Notice of Proposed Amendment 2017-05 (A)

Introduction of a regulatory framework for the operation of drones

Unmanned aircraft system operations in the open and specific category

RMT.0230

Recommendations – Care & medical Robots

- Human factor is still fundamental
- Proper training of surgeons
- Vital to respect the principle of the **supervised autonomy of robots**

Recommendations – Human repair and enhancement

- Cyber physical systems
- Appropriately staffed **committees on robot ethics**, in hospitals & health care institutions
- Patching and updating of vital medical applications (also by independent trusted entities)

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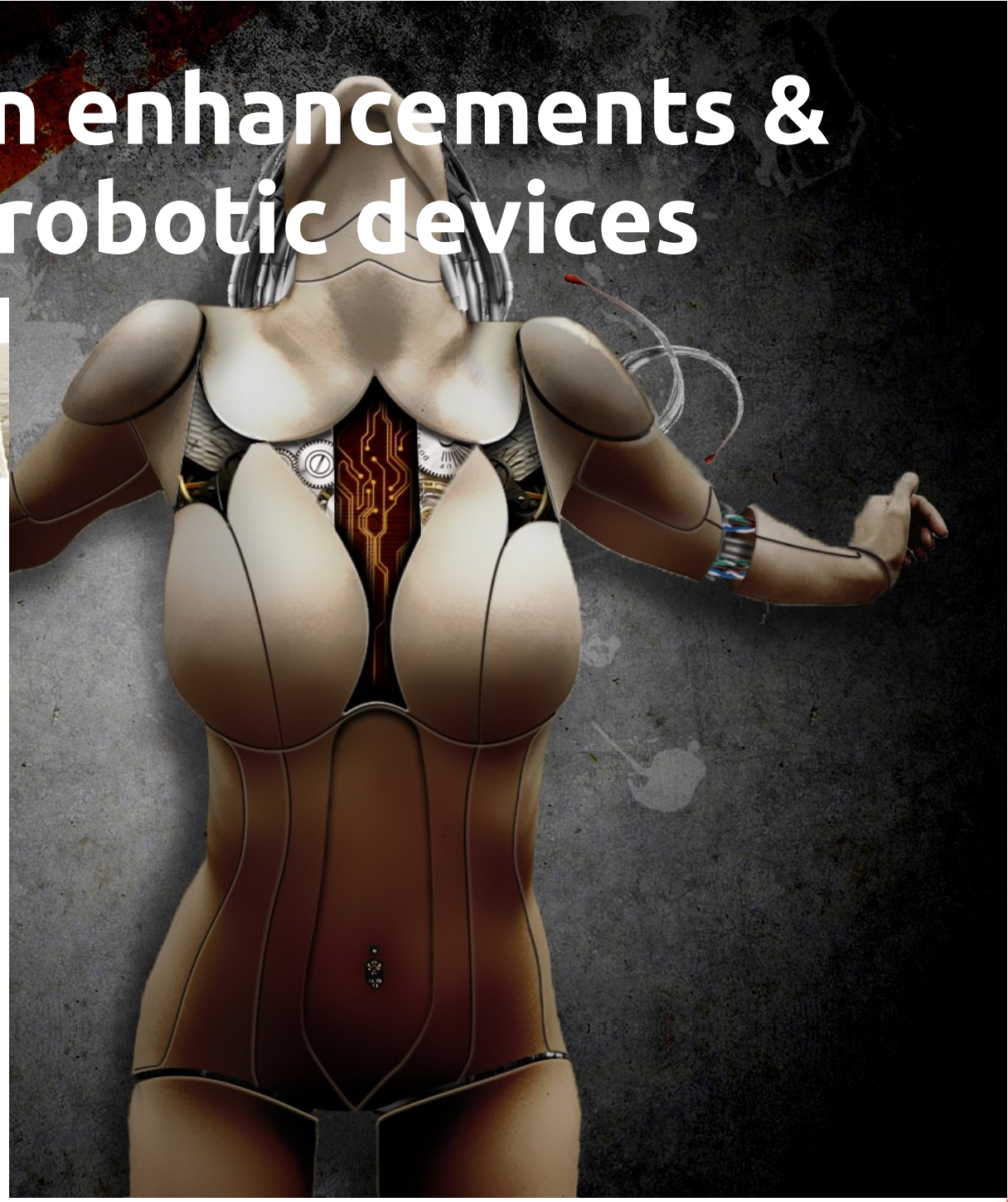
Human enhancements & biorobotic devices

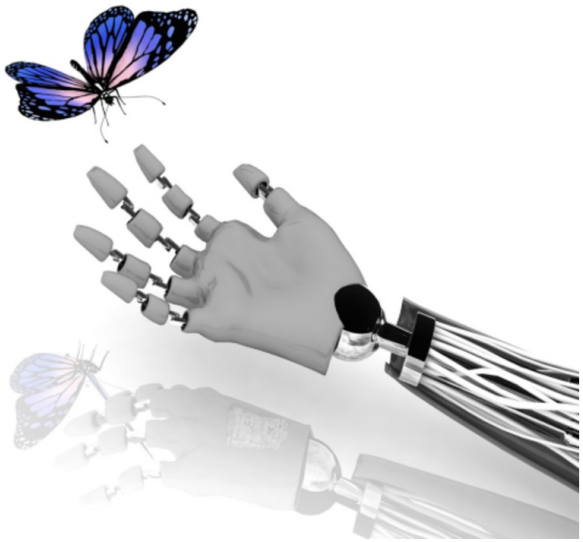


3B Scientific
SCIENCE EDUCATION INSIGHTS

« The Interconnectivity of Earthquakes & The Importance of Listening to Chopsticks | Main

MAY 11, 2017

Redefining 'Human' with the Future of Bionics



In 2003, scientist Ray Kurzweil first tested a computer chip designed to replace the hippocampus, the area of the brain often damaged due to disorders such as Alzheimer's and other degenerative brain diseases. In 2015, Ray Flynn received the first bionic eye transplant and in 2013 the first entirely bionic human (named Frank), with fully functional biological systems, was revealed.

Recommendations – Liability I

- European framework
- Smooth joint human / robot activities
- Legislative initiatives + soft laws
- No limitation on damages not to property, on the sole grounds that damage is caused by a non-human agent
- Strict liability or risk management approach?
- **At least at the present stage the responsibility must lie with a human and not a robot**

The blame game: the monster or the creator?

We need to retain the principle that humans are responsible for their actions, while robots and other machines are not

euRobotics Topics Group
Ethical, Legal and Socio-economic Issues in Robotics

Recommendations – Liability II

- **Programming** vs **training**
  - Liability should be proportional to the actual level of instructions given to the robot and of its degree of autonomy, so that the greater a robot's learning capability or autonomy, and the longer a robot's training, **the greater the responsibility of its trainer should be**
- Obligatory insurance scheme, taking into account all potential responsibilities in the chain
- Compensation fund for uninsured robots
- Limited liability for the **manufacturer**, the **programmer**, the **owner** or the **user**, if they contribute to a compensation fund, as well as if they **jointly** take out insurance to guarantee compensation where damage is caused by a robot

The Jessica Rabbit principle, applied to robotics

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The importance of training

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Artificial intelligence (AI)

Tay, Microsoft's AI chatbot, gets a crash course in racism from Twitter

Attempt to engage millennials with artificial intelligence backfires hours after launch, with TayTweets account citing Hitler and supporting Donald Trump

Tay uses a combination of artificial intelligence and editorial written by a team including improvisional comedians. Photograph: Twitter

This article is 1 year old

5,379

Elle Hunt

@mlle_elle

Thursday 24 March 2016 06.41 GMT

Microsoft's attempt at engaging millennials with artificial intelligence has backfired hours into its launch, with waggish Twitter users teaching its chatbot how to be racist.

The company launched a verified Twitter account for "Tay" - billed as its "AI fam

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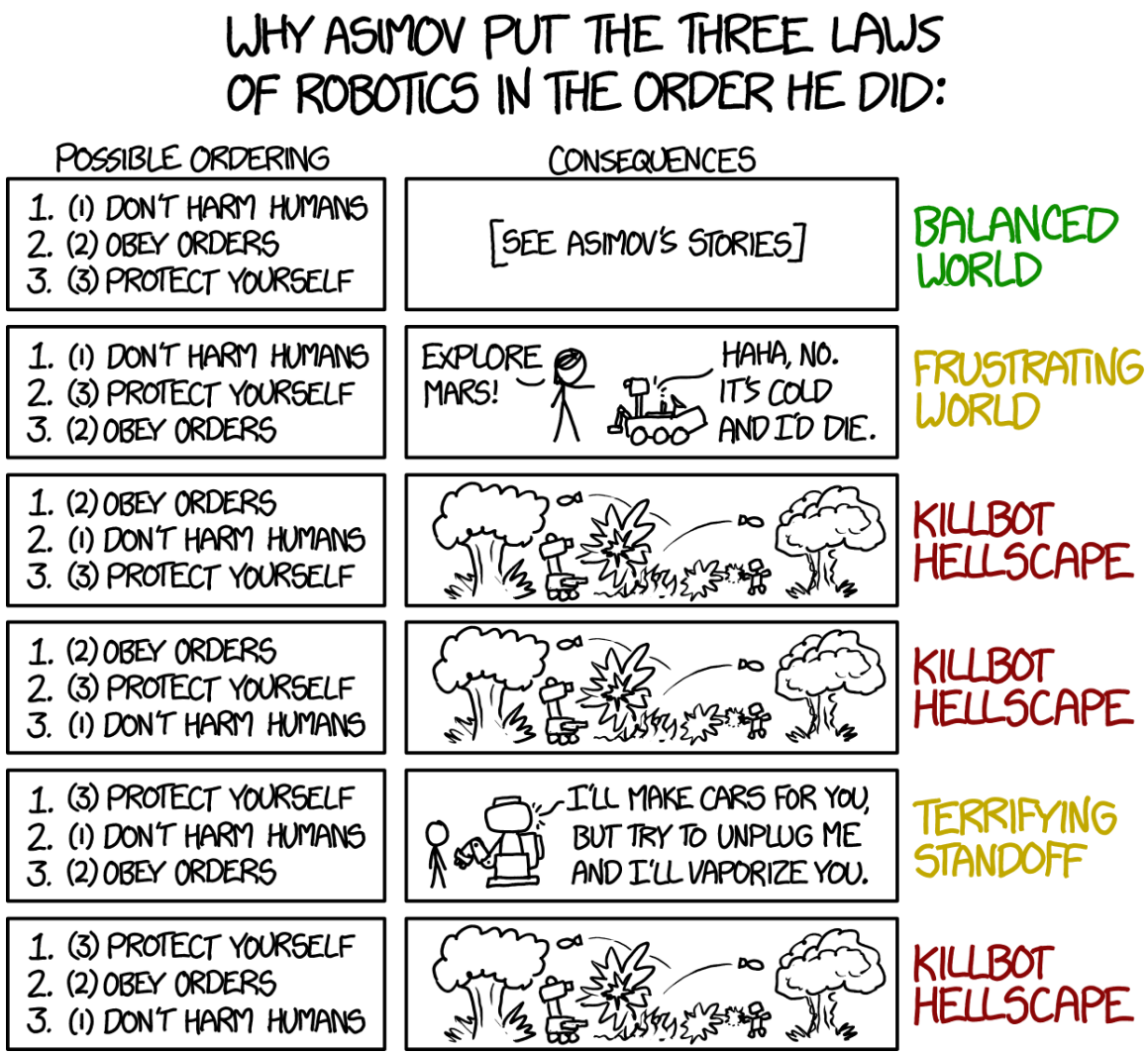
Asimov's laws are not enough (sorry, Isaac...)

- A robot may not injure a human being or, through inaction, allow a human being to come to harm
- A robot must obey the orders given by human beings except where such orders would conflict with the first law
- A robot must protect its own existence as long as such protection does not conflict with the first or second laws

Even if you change their order...



CC BY NC

https://xkcd.com/1613/

The future of RoboLiability

- The inadequacies of existing rules suggests to radically replace a fault based rule with a risk-management approach (based on absolute liability rules), holding **liable the party who is better placed to minimize the cost and acquire insurance**

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Ethical, Legal and Socio-economic Issues in Robotics

And finally, RoboArt

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Art

Vincent van Bot: the robots turning their hand to art

Twenty-six robots designed by students across the US will compete in an art contest that offers a glimpse into the creative potentials of artificial intelligence

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Nadja Sayej

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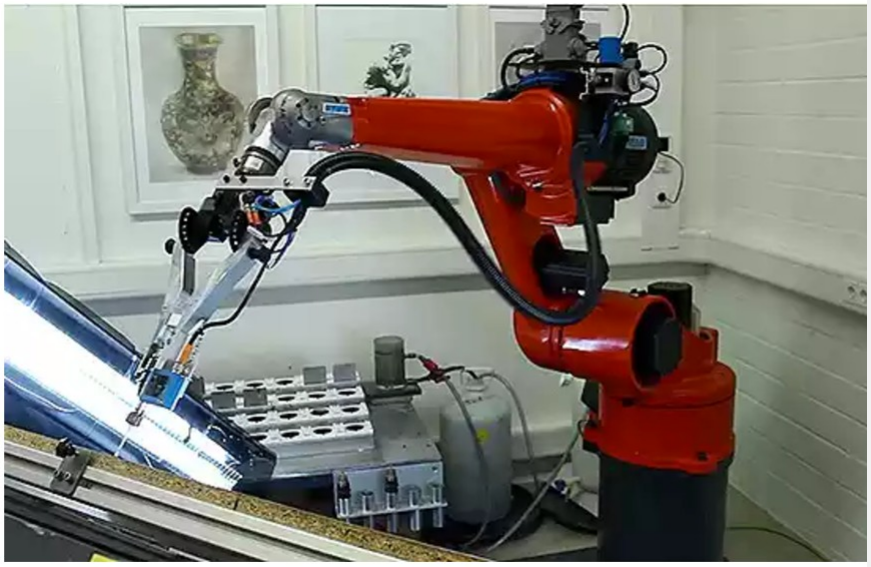

e-David sets to work in his studio. Photograph: Supplied

MAK / Exhibitions

Hello, Robot.
Design between Human and Machine
Hello, Robot. Design between Human and Machine will take a look at how robotics is entering our everyday lives and show the decisive role played by design.
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Many thanks to Marco Scialdone for the idea

In conclusion, we might ask Marvin...

“I've calculated your chance of survival, but I don't think you'll like it”

By Chris Favero - USA (Marvin the Paranoid Android #cosplay #C2E2 2015) via Wikimedia Commons

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The success of robots lies, quite literally, in your hands

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Questions?

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Avv. Giovanni Battista Gallus

Let's continue the conversation

gallus@array.eu @gbgallus