

The problem of cyborgs

Intro to AI course
Fall 2020

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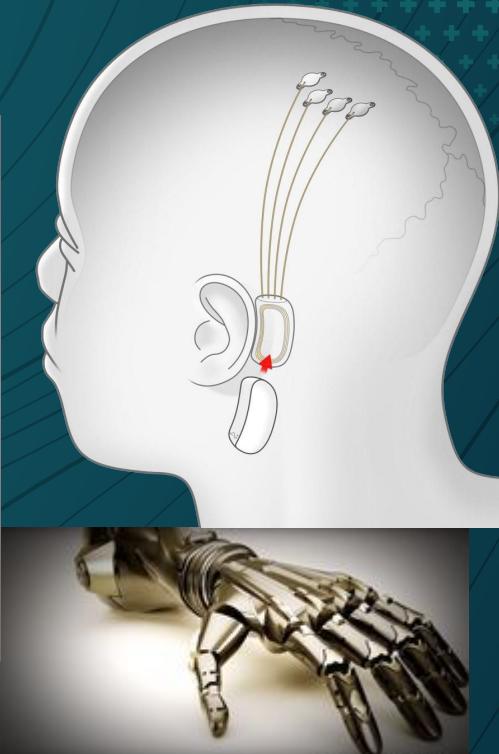


Who is a cyborg?

A cyborg is a "cybernetic organism":
a human with both organic and biomechatronic
body parts.



+



What makes a person a cyborg?

Prostheses

[limbs, vision, hearing]

Enhancements technology implanted within the body

Brain enhancement or modification

Wearables

[Information transmitting]

'Eyeborg' - Rob Spence

Prosthetic eye with a video camera - records and transmits images.

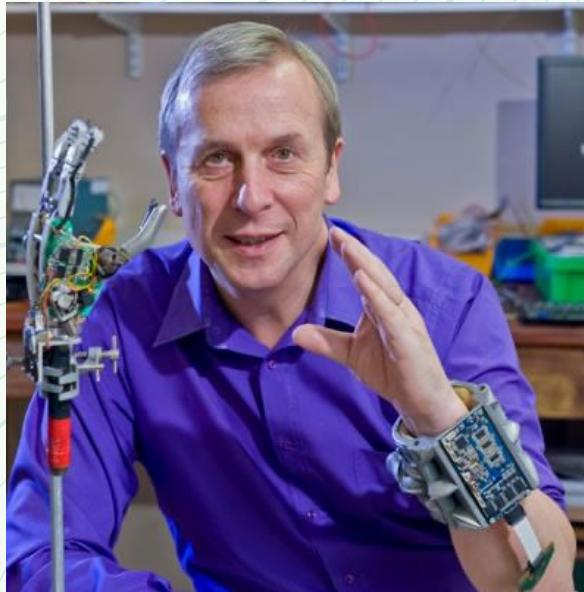
The built-in camera transmits data to a remote server but does not interact with Rob.



non-cognitive implant

'Captain Cyborg' - Kevin Warwick

Conducted an experiment with electrodes to transmit sensations from a robotic arm



Kevin's wife LED are dependent on his emotions

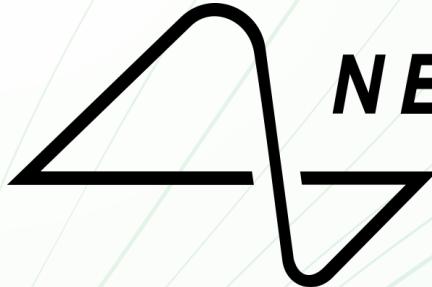
Les Baugh

Robotic arms are controlled with a person's mind just like a regular arm



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Who actually makes cyborgs so cool?



NEURALINK



ReWalk™
More Than Walking.

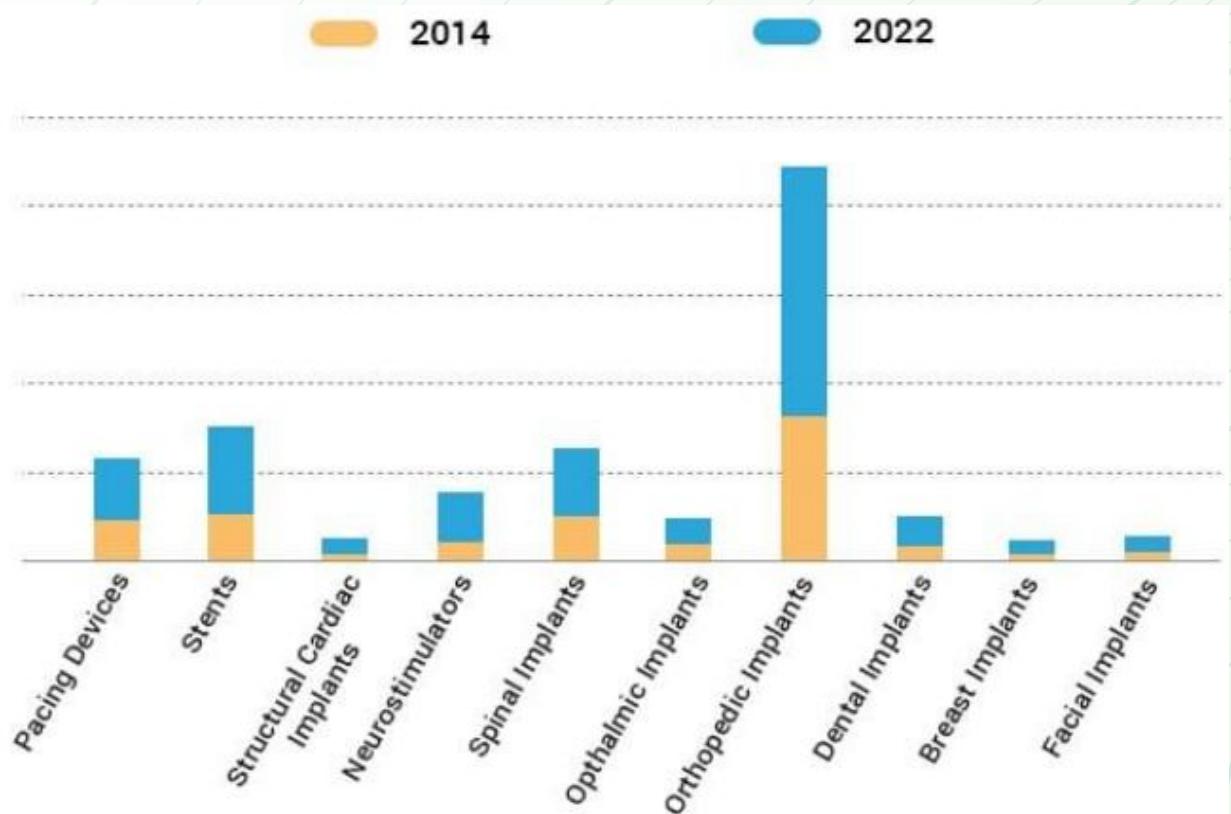
SECOND SIGHT



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MED-EL

Future of cyborgs



Source

Market is expected to garner \$116 billion by 2022

**10% of the US people
are cyborgs**

What's the problem?

Are we all equal ?



Do people with prosthetics have an advantage over regular humans?



VS



Oscar Pistorius

Can cyborgs access their data?

Manufacturers do not allow patients to access the data produced by their devices.



Hugo Campo has been fighting for the right to access the data from implanted defibrillator.



NO SUCCESS

'First cyborg' - Neil Harbisson

The 1st cyborg right was to have a passport picture with his antenna

He was hacked

In 2012, he faced bullying from Barcelona police thinking he was filming



Risks

SOCIETY

Unfairness
Non-tolerance
Restrictions

HEALTH

Infections
Surgeries
Side effects

INFORMATION

Hacking
Surveillance
Info stealing

Existing laws and principles

Since 2008, US Congress declared that cyborgs are humans with disabilities

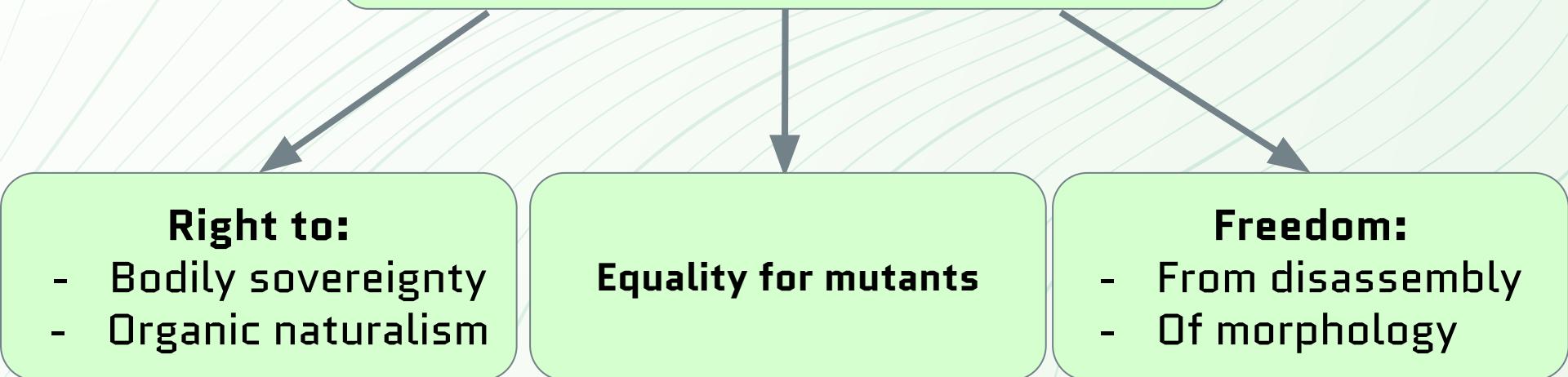
They must receive benefits

SIGH

THAT'S SO SAD

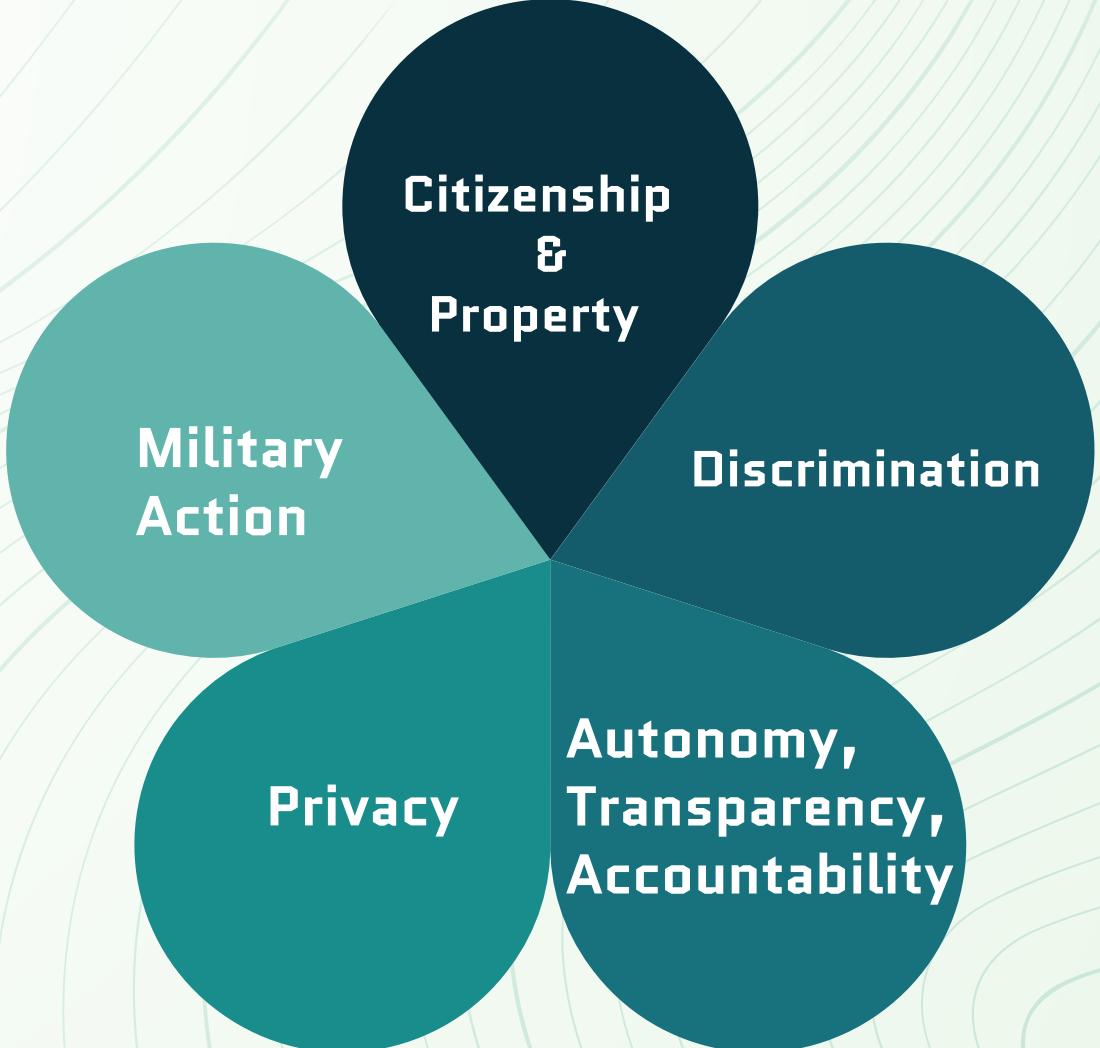
The cyborg bill of rights V1.0

CYBORG FOUNDATION + Rich MacKinnon
2016



Source

What kind of laws do we need ?



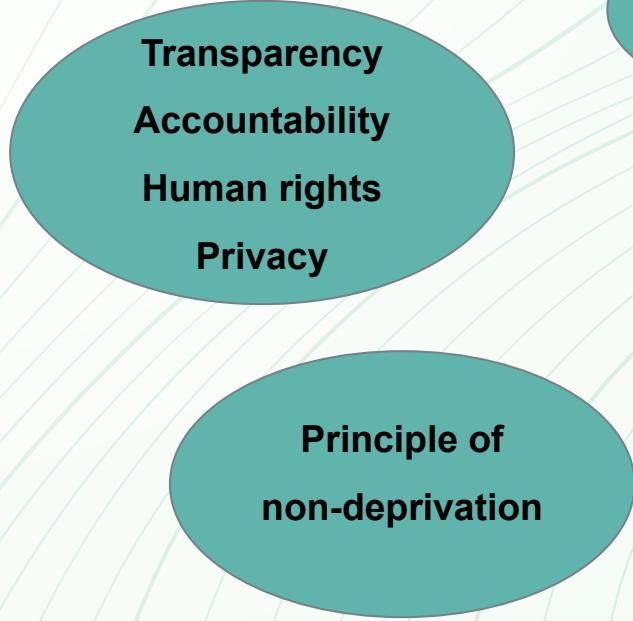
Cyborg as a human with... disabilities

superior possibilities

- Equality principles with special rights
- Social insurance
- Labor rights (addition protection)

- Equality principles with limitations
 - Autonomy
 - Military actions
 - Surveillance & Data collection
- Cheating on exams, competitions
- Terrorism
- Hacking of systems

General rights for both types



Christian Kandlbauer

The first in Europe to wear an innovative high-tech artificial arm controlled by mind

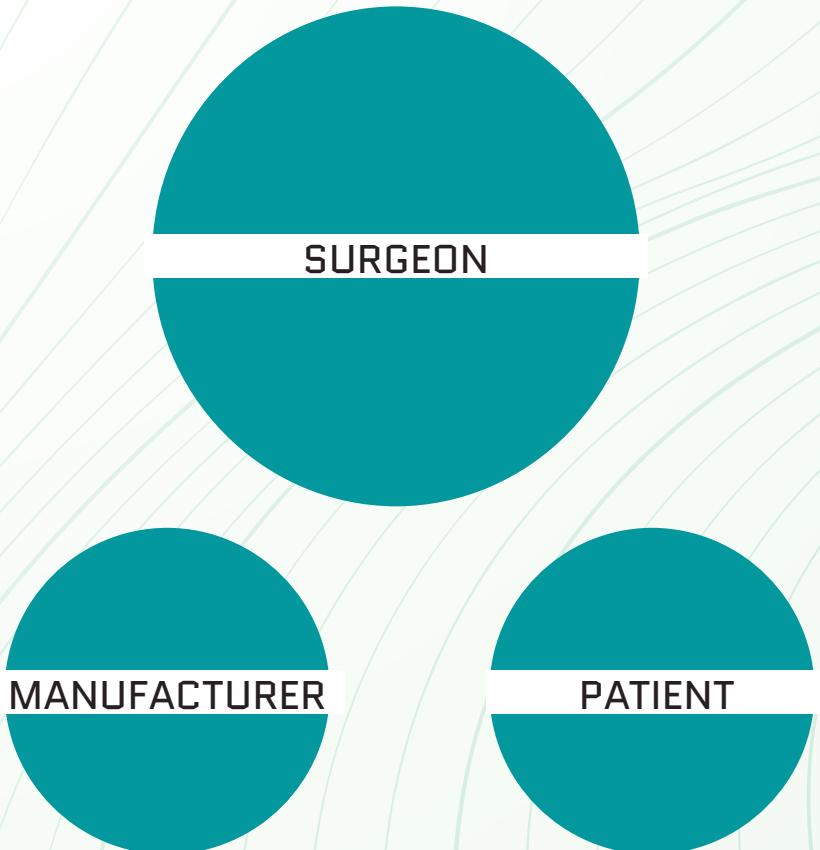
Ended up in the car accident...

If happened due to prosthetics:

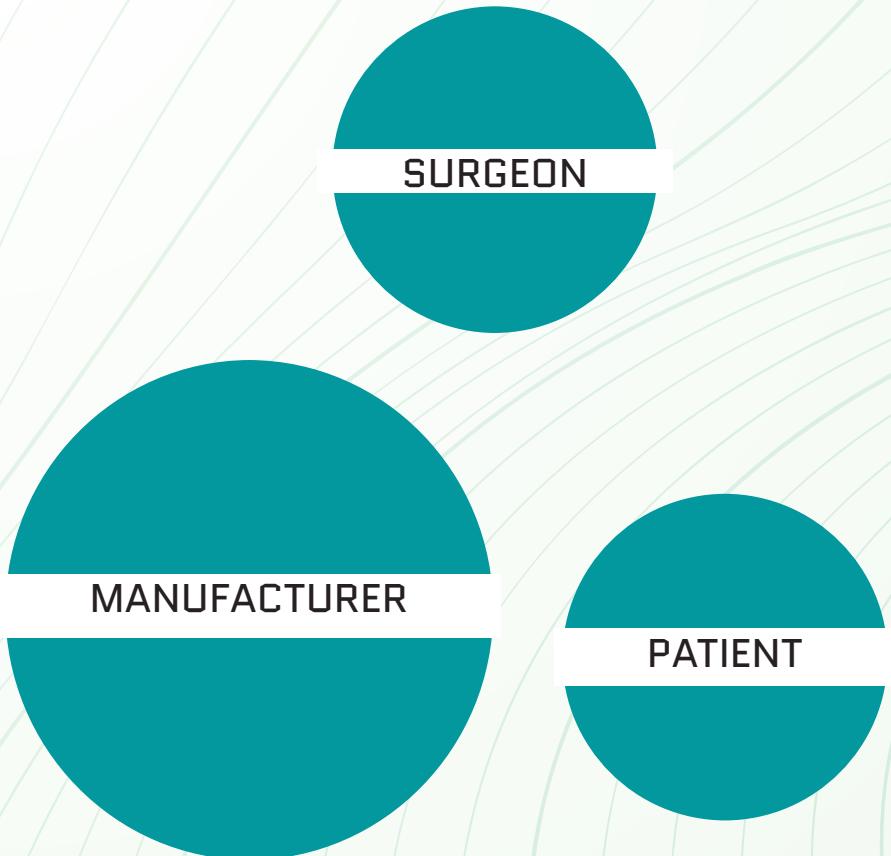
Prosthetic malfunction?
Lost control of prosthetic?
Was he hacked?



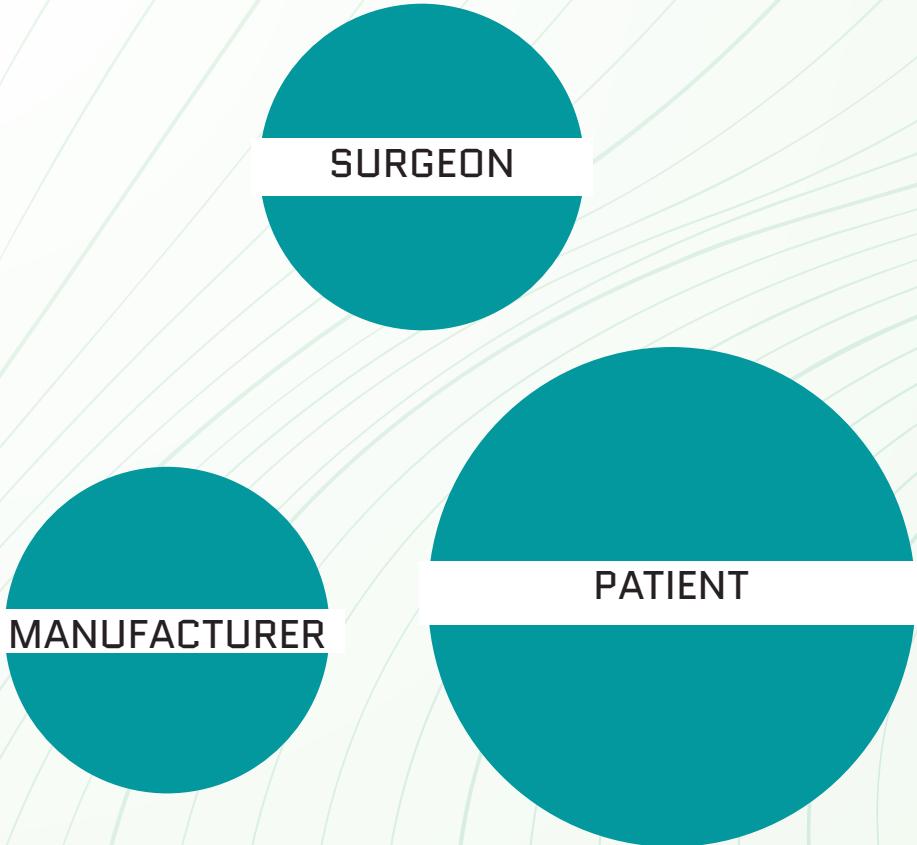
Who is to blame?



- Wrong treatment or death during the operation.
- Physical/Mental bad effect on the cyborg's health status
- Unsuitable raw materials of implants for human beings.



- Misuse due to incomplete users guide
- Significant difference, fraud, or deception between perception and reality
- Hacked because of insecure and unreliable technology.
- Confidential data leakage about cyborgs or their surroundings



Not following the manufacturer's and surgeon's usage guidelines

Unauthorized usage of the device itself or info from it

Using prosthetics for hacking/harming activities



Thanks!

We are ready to answer your questions

Backup slides

Cameron Clapp

has a couple of prosthetic legs, which he controls by his brain with the help of a microprocessor.

- At age 15, he was struck by a train, losing both of his legs and one arm
- With prosthetic legs he has become an athlete and an amputee activist.
- Cameron uses prosthetic legs with the Otto Bock C-Leg computer knee system. Using sensors that monitor the position of the leg, signals are sent to microprocessors in the knees to determine what resistance the leg's hydraulic cylinders need in order to make the most natural step possible.



Why?



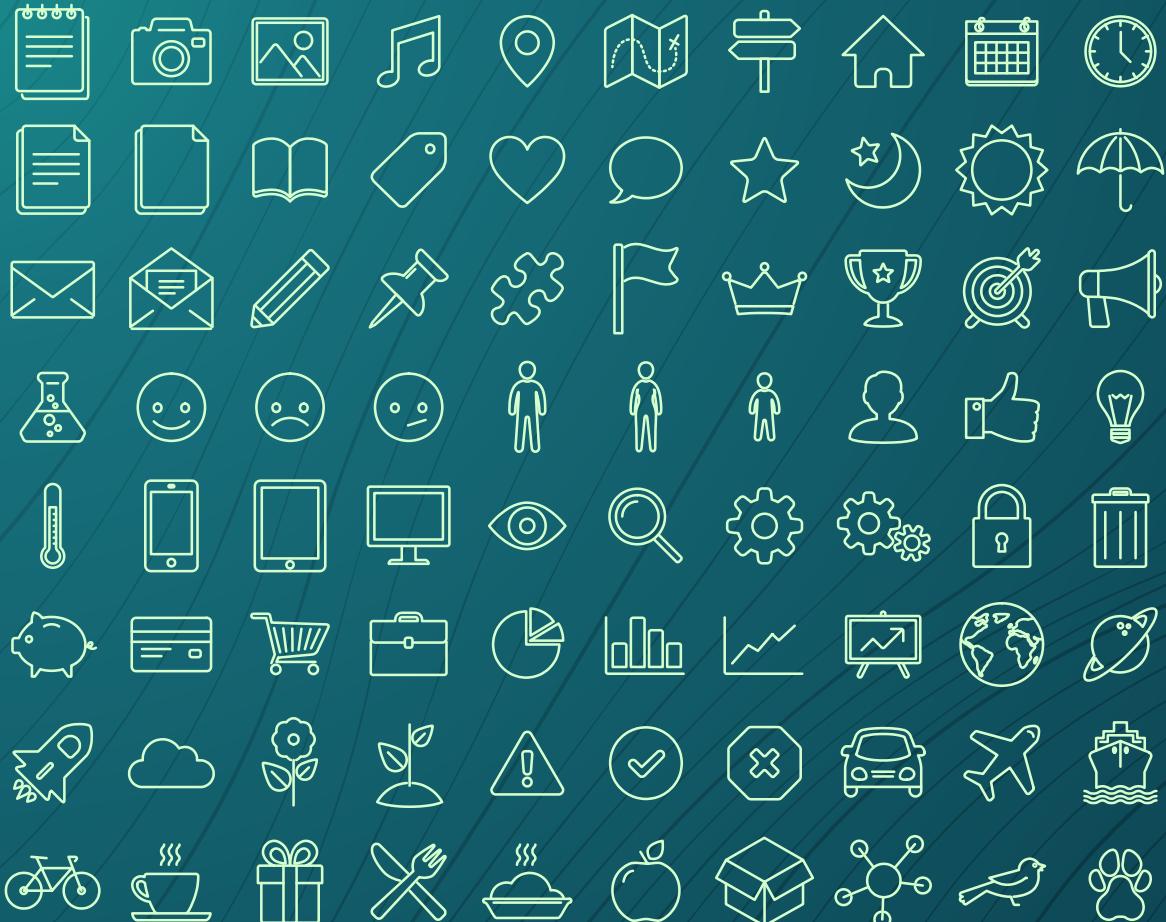
The cyborgs limitations

Surveillance
&
Data collection

Cheating
on exams,
competitions

Terrorism

Hacking of
systems



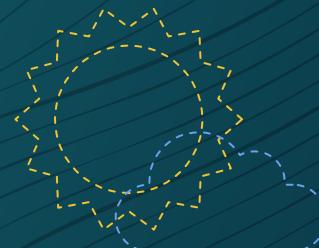
SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change fill color and opacity.
- Change line color, width and style.

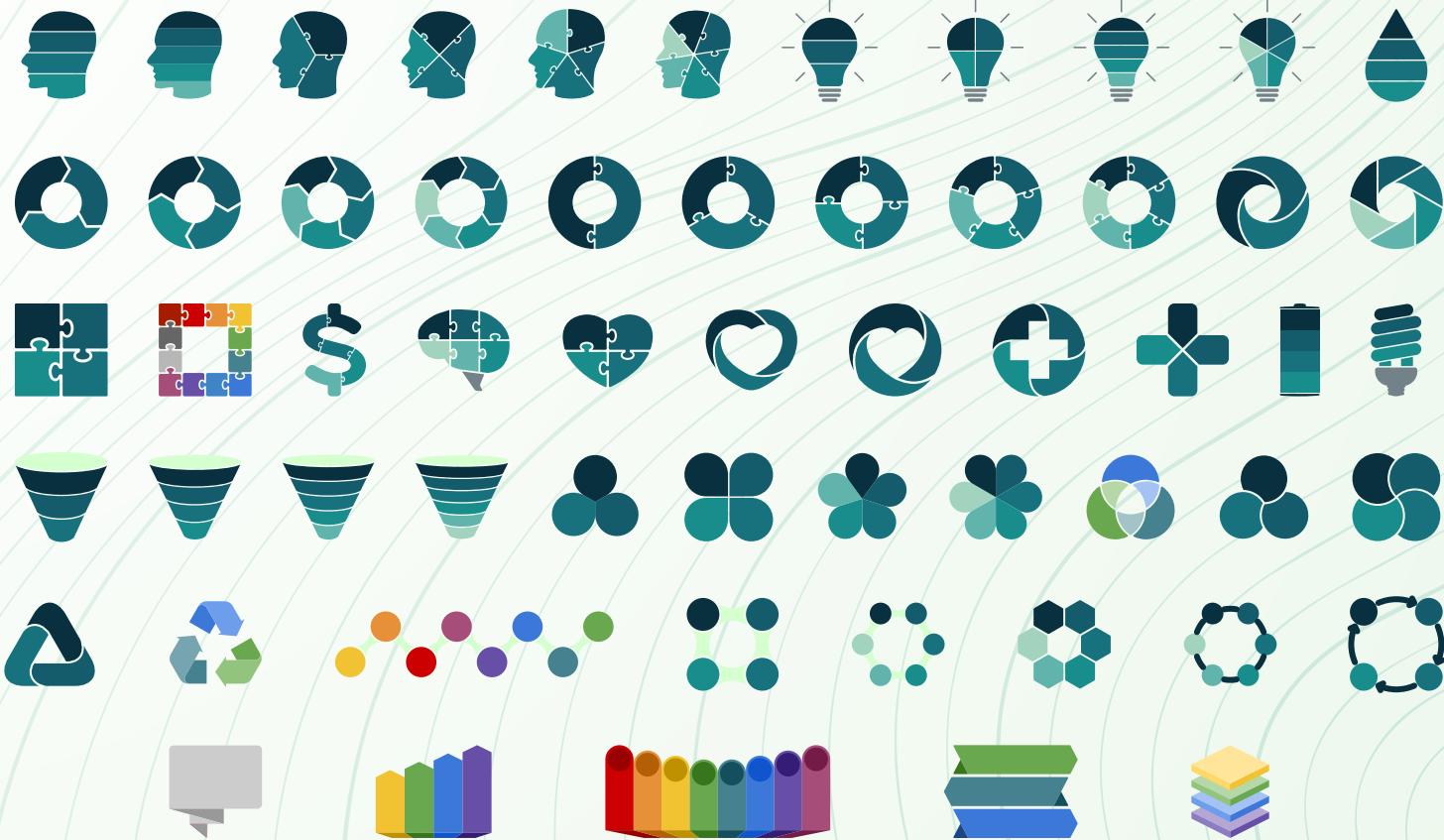
Isn't that nice? :)

Examples:



Find more icons at
slidescarnival.com/extra-free-resources-icons-and-maps

Diagrams and infographics





You can also use any emoji as an icon!
And of course it resizes without losing quality.

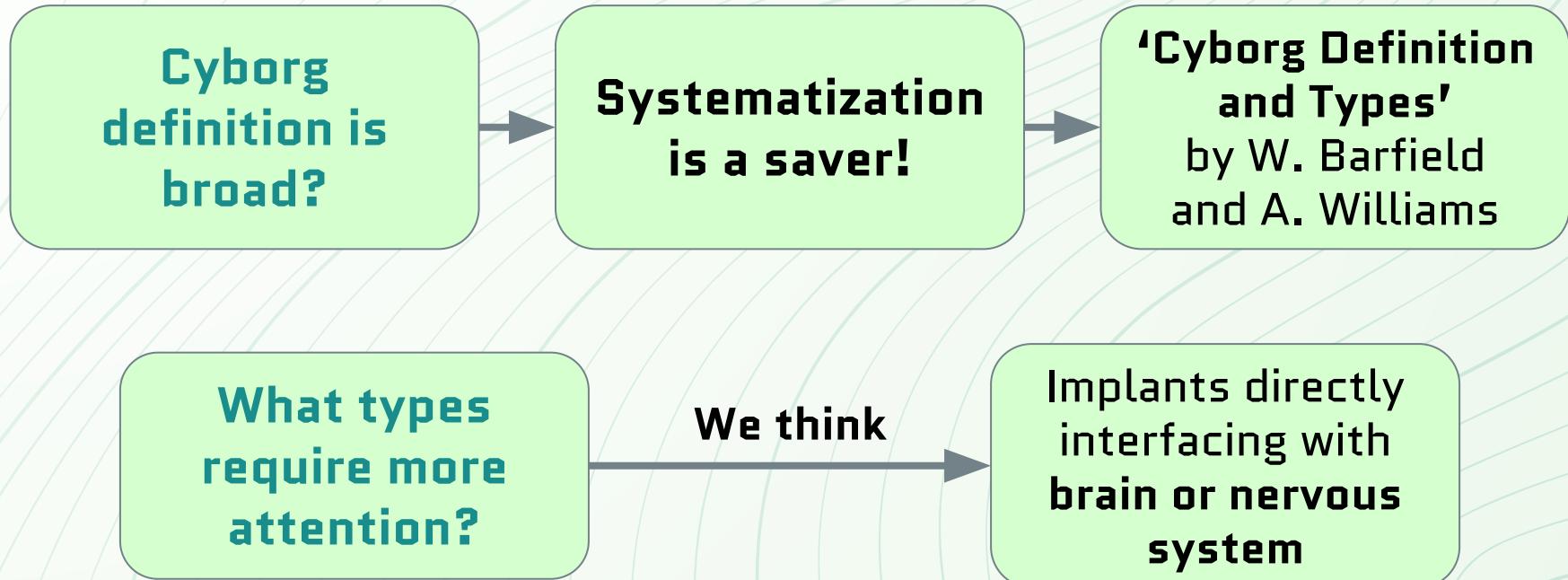
How? Follow Google instructions

<https://twitter.com/googledocs/status/730087240156643328>

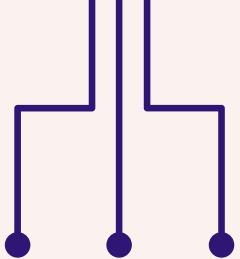


many more...

Cyborg classification



SPECIAL RIGHTS



PRINCIPLE OF NON-DEPRIVATION

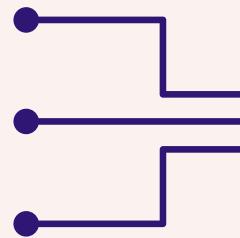
PROTECTION AGAINST HACKING

SPECIAL INSURANCE/
WARRANTY

SAFETY AND AVAILABILITY OF CYBORG LIFE
SUPPORT SYSTEMS,

CERTIFICATION

ACCOUNTABILITY AND CONTROL OVER SYSTEM



Can an employer force employees to install
RFID-chips?

In Mexico, there was a case of government employees being chipped. In 2004, the attorney General of Mexico, along with 160 employees, passed the RFID-chipization procedure. The chip allowed access to the service database of crimes, as well as to determine the location of a person.

A study about RFID-chips was published on the website of the European Parliament in 2018. Currently, there is no legislation that regulates this technology, so we need to follow the general rules. From the EU decision, it can be concluded that they don't know how to treat the use of chips in relation to employees and employers.



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Les Baugh

Engineers at the Johns Hopkins University Applied Physics Lab have developed a next-generation prosthetic

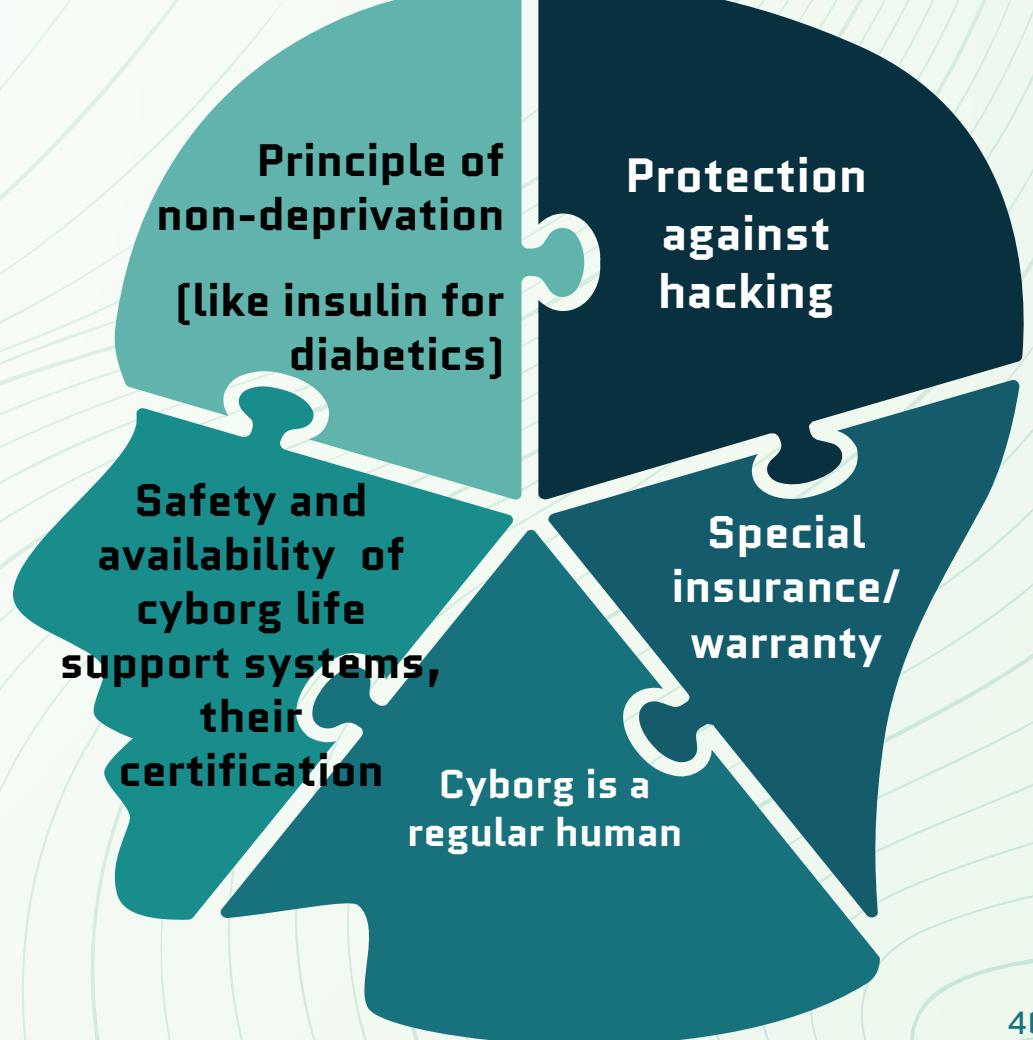
Robotic arm is controlled with a person's mind just like a regular arm

Mr. Baugh's custom socket can pick up brain signals to control the arms, just by thinking about the movements

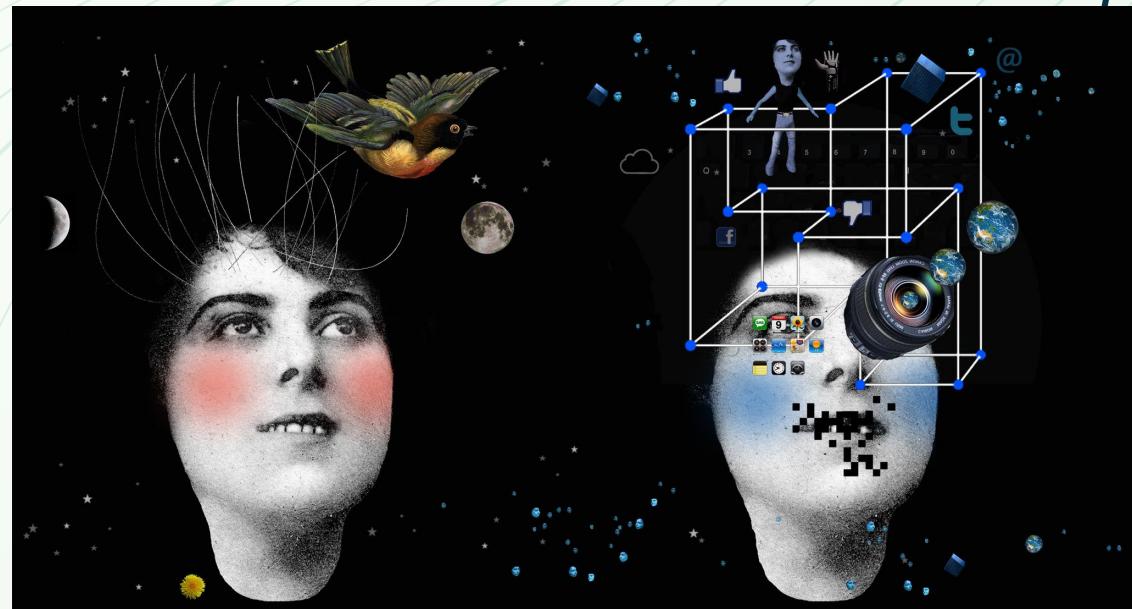


Laws and principles we need to support Cyborgs

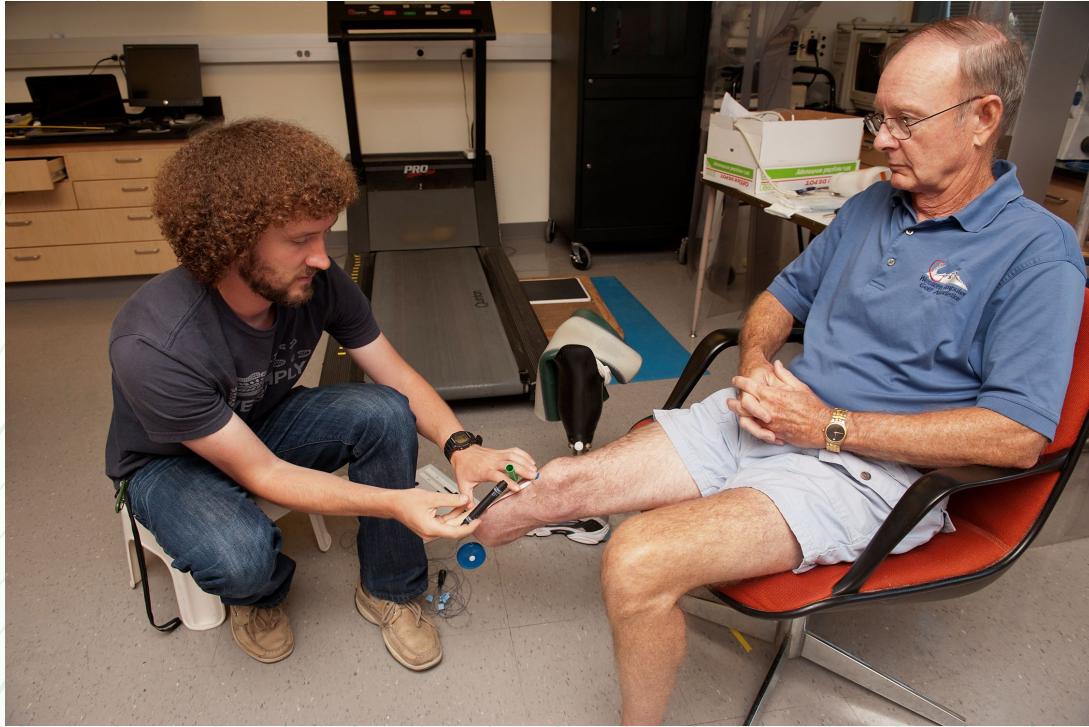
Harming prosthetics
=
Harming human



Problems with cyborgs?



Harming prosthetics = Harming human?



What is cyborg?

due to the
olution:

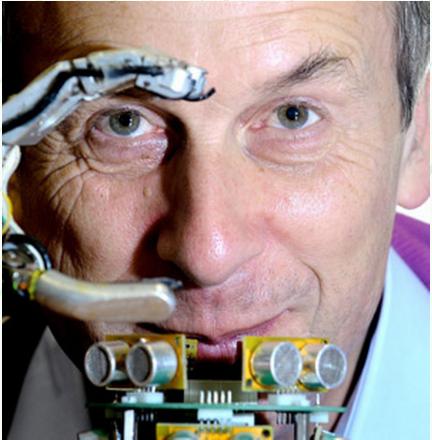
-- *a natural human merged with
an artificial system*



Enhancement Technology Implanted Within Body

Interfacing with nervous system

Direct Nervous System Interfacing

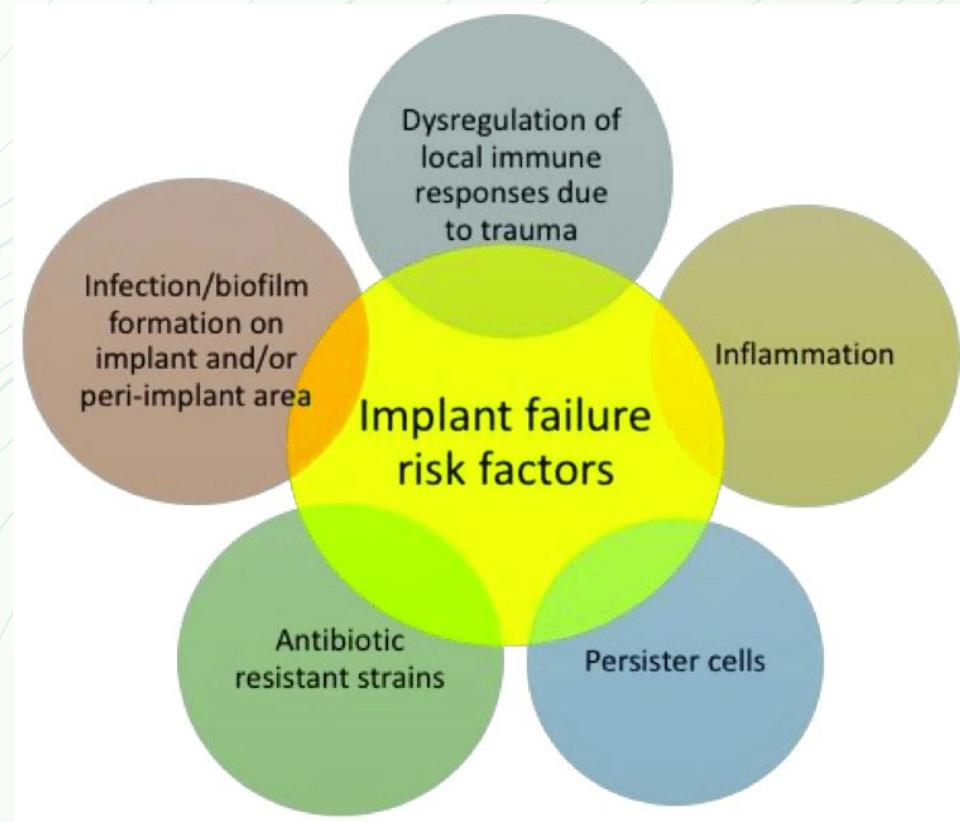


Recreating Sensation

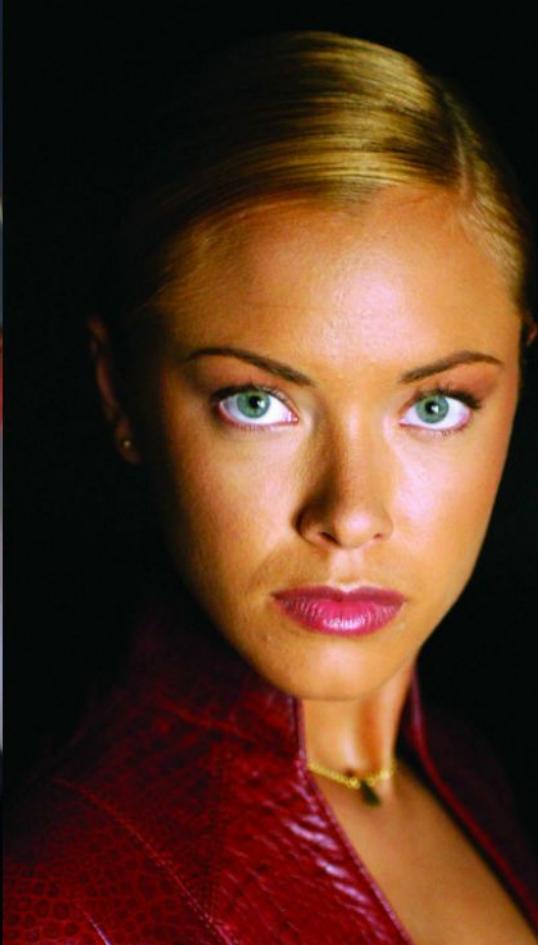
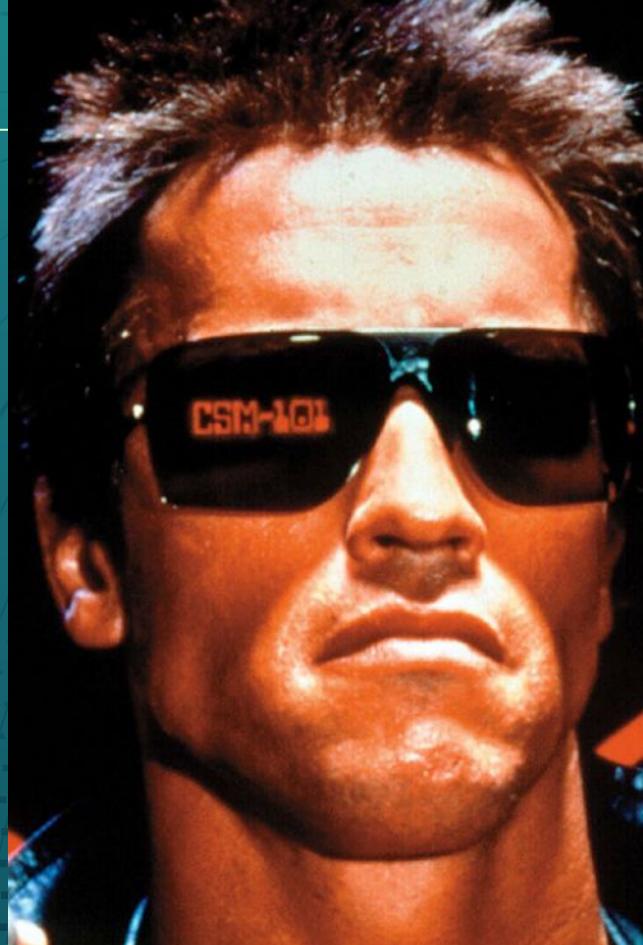


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Risks



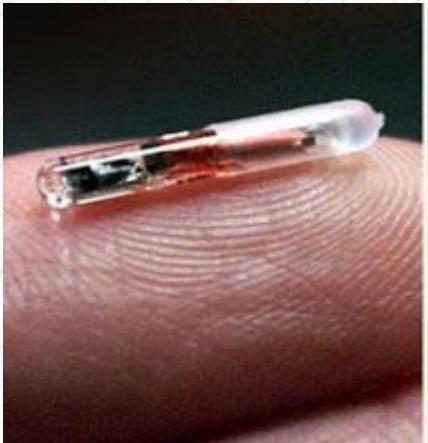
Who is cyborg?



Accidents & Warnings

2009: Gasson, **RFID tags** in his left hand

- vulnerable to software virus and malware when the system gets online



An x-ray image of Dr. Mark Gasson's left hand shows how small microchip implants can be (Credit: Mark Gasson)

Amal Graafstra warns **risk of catching MRSA**
- a type of staphylococcus resistant to many antibiotics and able to lead to death

Risks



Health effects

Can bring new virus that lead to death



Removal

Hard to input and output



SIDE EFFECTS

Device may irritate your skin



OPERATION

Any operation is fraught with risk



RESTRICTION

Sports activity, limit on life activities



NO GUARANTEE

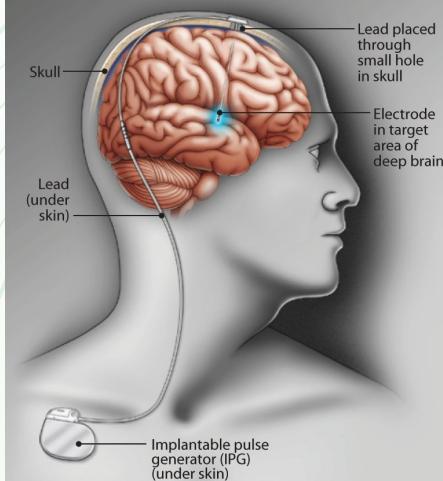
Everyone has different nature

Brain enhancement or modification

Neuron Control

To suppress neuron activity

Deep Brain Stimulation (DBS)



Reading mind

Linking thoughts with limbs and subjects



Influencing memory

Creation, retrieval or modification

Theodore Berger's artificial hippocampus