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dhelbing@ethz.ch

## Education 4.0: Preparing for the Digital Age

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# Digital Literacy and Digital Enlightenment



Aufklärung ist der Ausgang des Menschen aus seiner selbstverschuldeten Unmündigkeit. Unmündigkeit ist das Unvermögen, sich seines Verstandes ohne Leitung eines anderen zu bedienen. Selbstverschuldet ist diese Unmündigkeit, wenn die Ursache derselben nicht am Mangel des Verstandes, sondern der Entschließung und des Mutes liegt, sich seiner ohne Leitung eines anderen zu bedienen. Sapere aude! Habe Mut, dich deines eigenen Verstandes zu bedienen! ist also der Wahlspruch der Aufklärung.

(Immanuel Kant)

Where is the  
digital revolution heading?







http://www





# The Internet of Things



# Things Will Get Senses and Smart





# IN 60 SECONDS...

1  
**NEW**  
DEFINITION  
IS ADDED ON  
URBAN  
DICTIONARY

1,600+  
READS ON  
**Scribd**

13,000+ HOURS  
**MUSIC**  
STREAMING ON  
PANDORA

12,000+  
**NEW ADS**  
POSTED ON  
craigslist

370,000+ MINUTES  
VOICE CALLS ON  
**skype**

98,000+  
**TWEETS**



20,000+  
**NEW**  
POSTS ON  
tumblr



320+  
**NEW**  
twitter  
ACCOUNTS



100+  
**NEW**  
Linkedin  
ACCOUNTS

Y  
THE  
WORLD'S  
LARGEST  
COMMUNITY  
CREATED CONTENT!!

13,000+  
**iPhone**  
APPLICATIONS  
DOWNLOADED

100+  
Answers.com  
40+  
YAHOO! ANSWERS



600+  
**NEW**  
VIDEOS

2  
QUESTIONS  
ASKED ON THE  
INTERNET...

25+ HOURS  
**TOTAL**  
DURATION



70+  
**DOMAINS**  
REGISTERED

60+  
**NEW**  
BLOGS

168 MILLION  
EMAILS  
ARE SENT

694,445  
**SEARCH**  
QUERIES

1,700+  
**Firefox**  
DOWNLOADS

50+  
**WORDPRESS**  
DOWNLOADS

695,000+  
**facebook**  
STATUS  
UPDATES



125+  
**PLUGIN**  
DOWNLOADS

79,364  
**WALL**  
POSTS



510,040  
**COMMENTS**



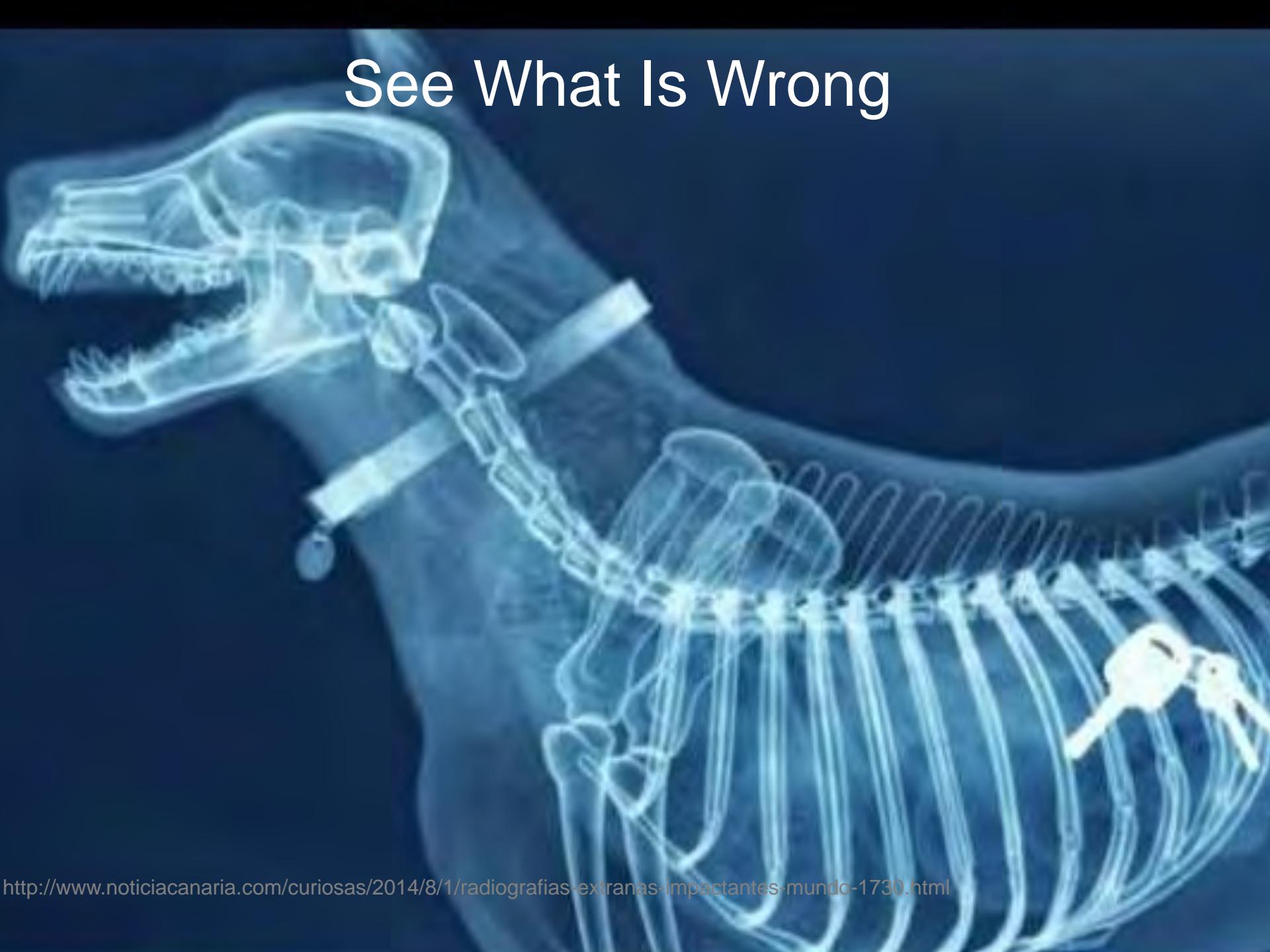
Google  
Google Search

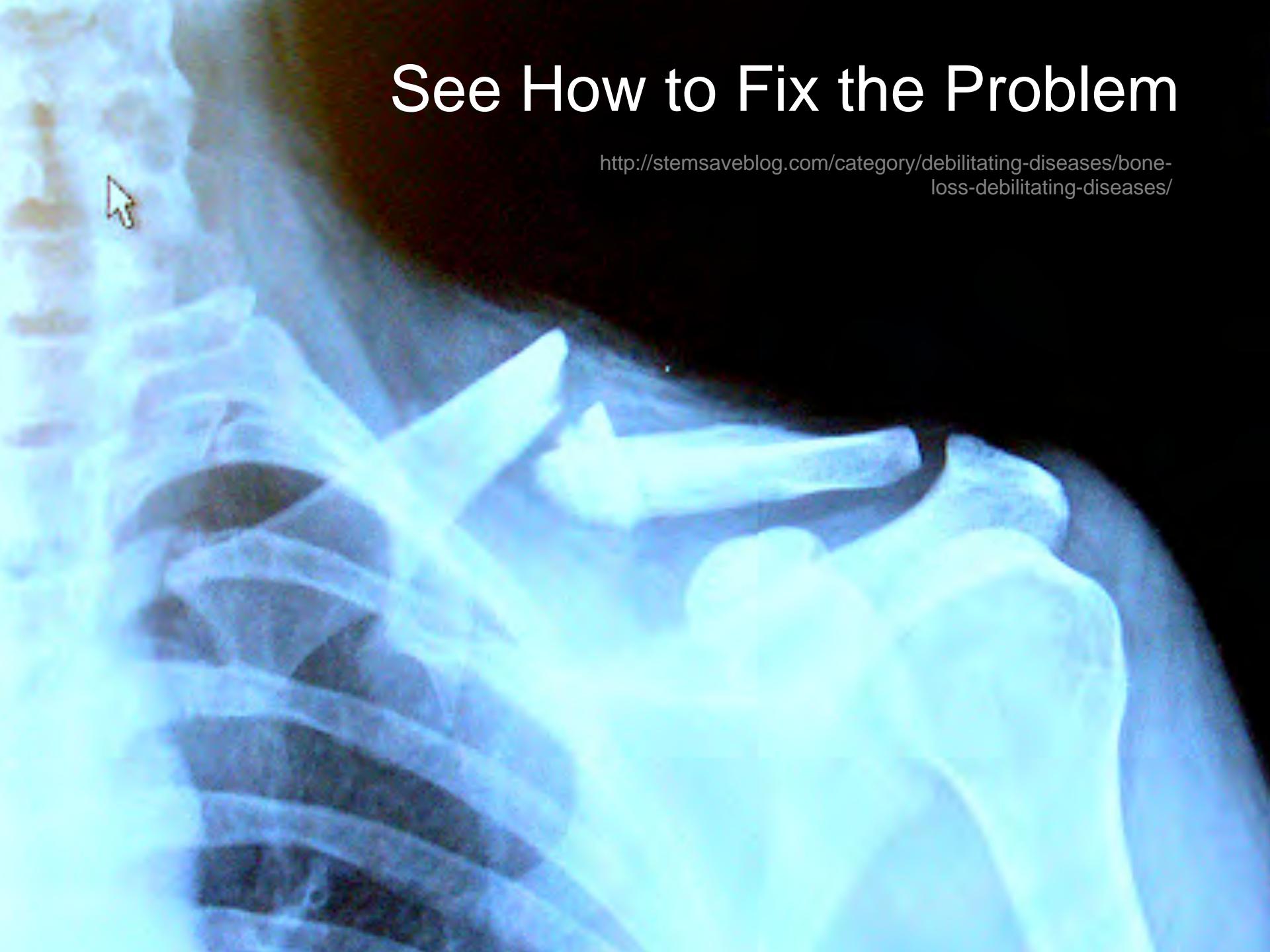
# CHRIS ANDERSON'S DREAM:

The end of theory: the data deluge makes the scientific method obsolete.

Wired Magazine 16(7), 2008

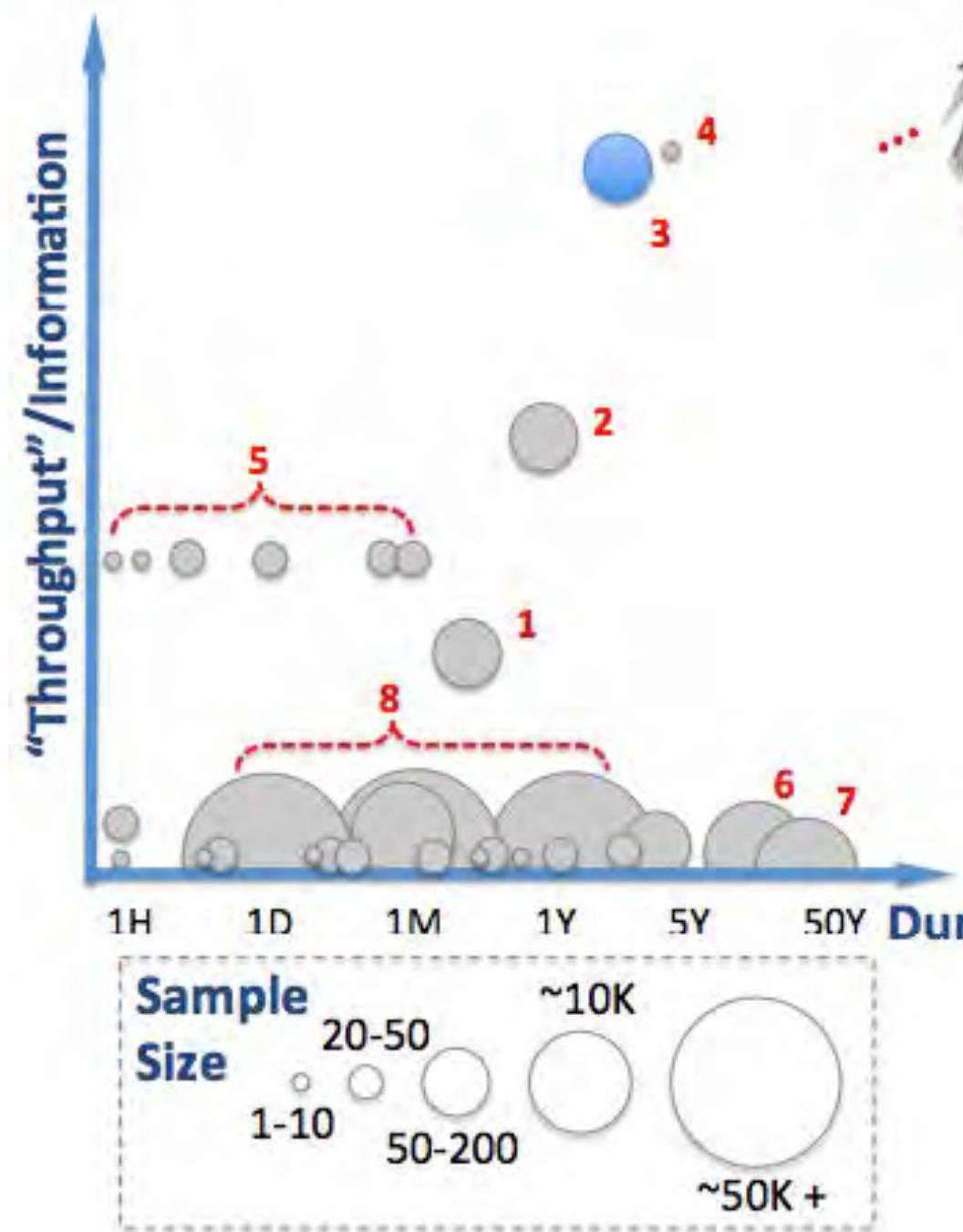
# See What Is Wrong





# See How to Fix the Problem

<http://stemsavetech.com/category/debilitating-diseases/bone-loss-debilitating-diseases/>



Can We Know  
Everything?

Can We  
Understand the  
Human Body,  
Brain and  
Personality?

A. Pentland et al.

GET ALL THE  
INFORMATION YOU CAN,  
WE'LL THINK OF A  
USE FOR IT LATER.



Hello. Sign in to get [personalized recommendations](#). New customer? [Start here.](#)

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 Today's Deals

Gifts & Wish Lists

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Movies & TV

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**DVD**

## Jon and Kate Plus Ei8ht: The Complete Season 4 (6 DVD Set)

**Starring:** [Jonathan Gosselin](#), [Kate Gosselin](#) **Director:** [Jennifer](#)

**Stocks Format:** [DVD](#)

List Price: ~~\$49.98~~

Price: **\$29.99** & this item ships for **FREE** with **Super Saver Shipping**. [Details](#)

You Save: **\$19.99 (40%)**

**In Stock.**

Ships from and sold by **Amazon.com**. Gift-wrap available

### Customers Who Bought This Item Also Bought



[Hanging Ceiling Fan](#)



[12" Footstool](#)

     (1) \$94.99

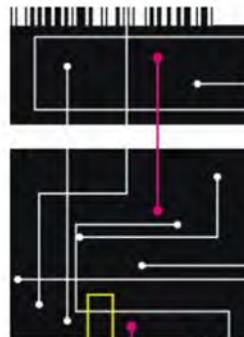
     (10) \$36.99





## Was die Kreditkarte verrät



Digitale Spuren: Vier Transaktionen verraten die Person - Wissen ...

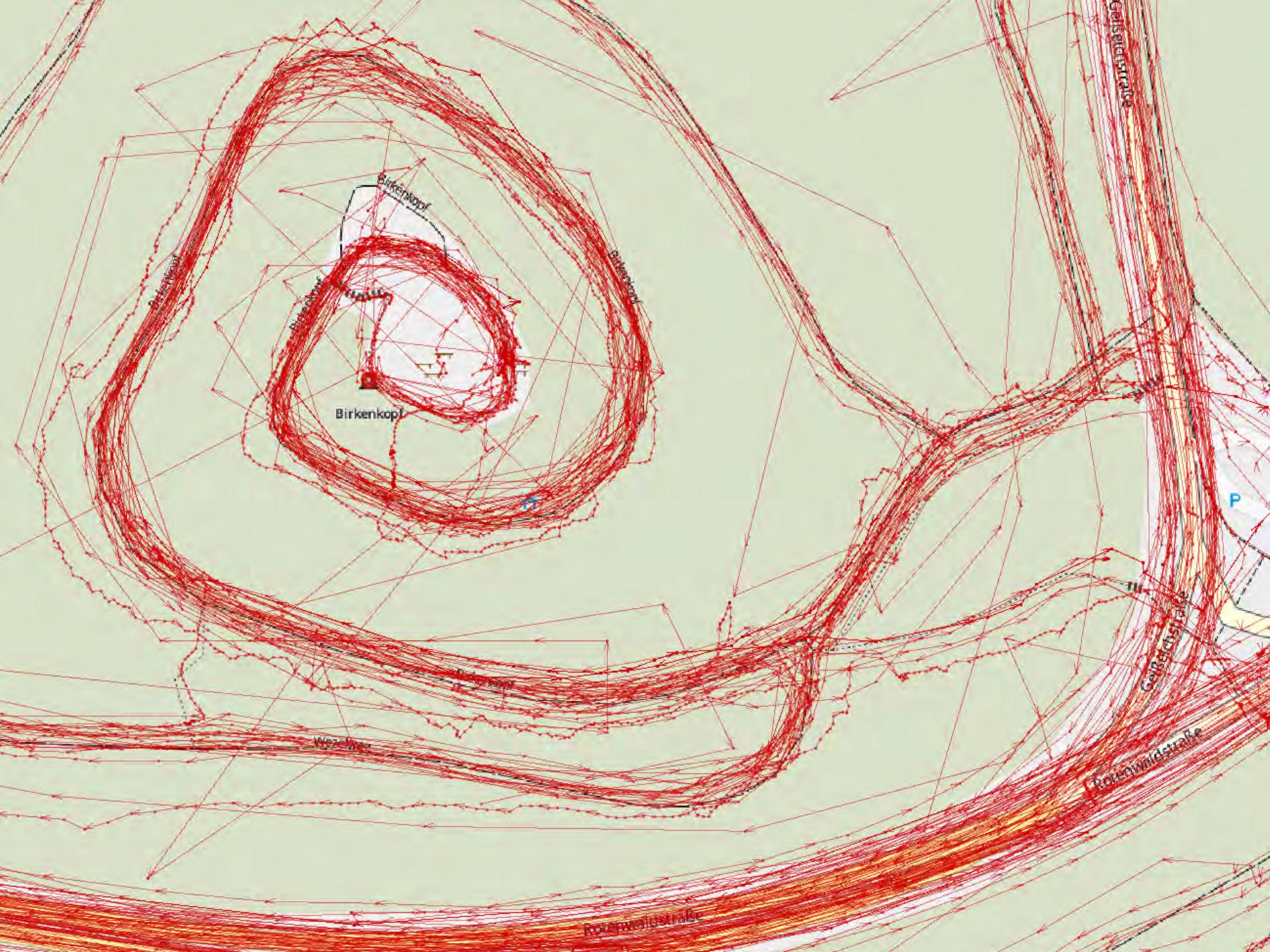
[www.sueddeutsche.de](http://www.sueddeutsche.de) › Politik › Datenschutz › [Translate this page](#)

Jan 30, 2015 - Lediglich vier Datenpunkte reichten in den meisten Fällen aus, schreiben sie in der aktuellen Ausgabe des Fachmagazins Science, um eine Person in der Datenbank eindeutig zu identifizieren. Wenn man etwa das Konsumverhalten eines Freundes durchleuchten will, so genügen dafür also sehr einfache ...

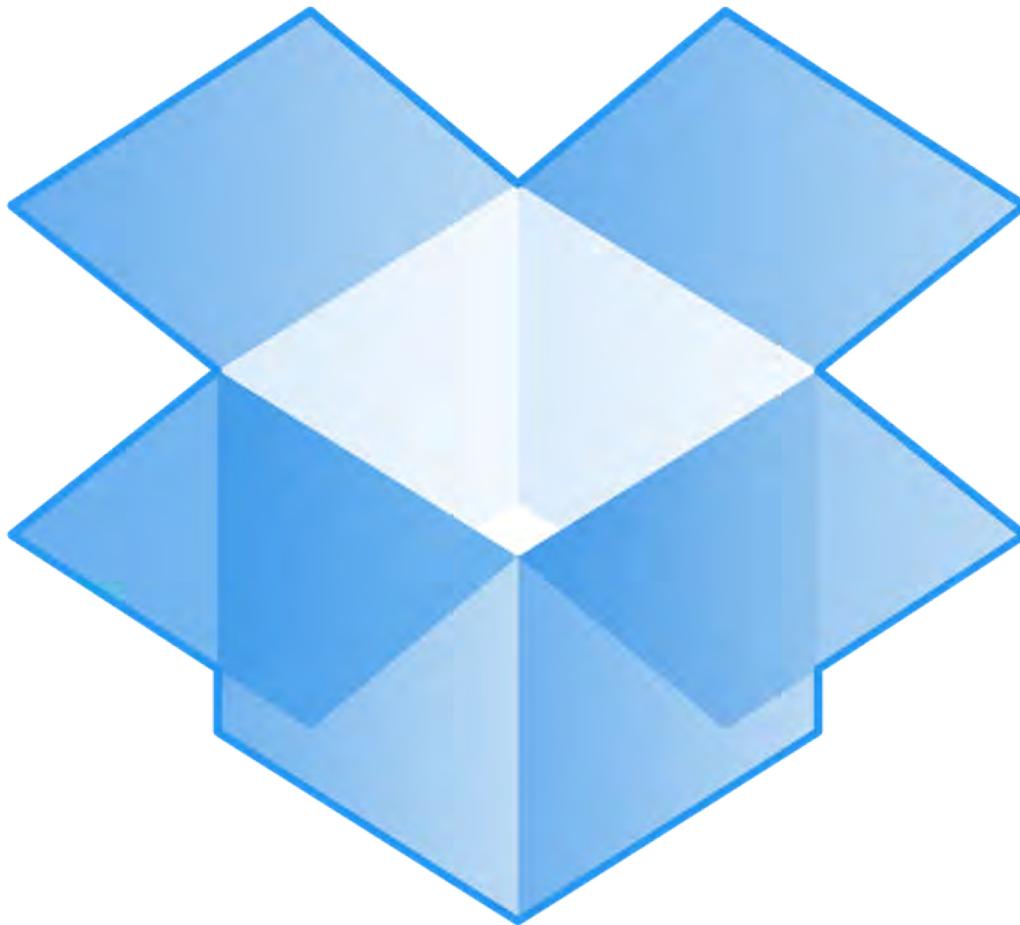


*Illustration: Stefan Dimitrov*

- Selbst große anonymisierte Datensätze bieten unter Umständen nur wenig Schutz, berichten Forscher im Fachmagazin *Science*.
- Die Wissenschaftler analysierten "einfach anonymisierte" Kreditkartentransaktionen von 1,1 Millionen Menschen über einen Zeitraum von drei Monaten hinweg.
- Anhand weniger Anhaltspunkte - wo jemand seinen Kaffee trank oder ins Restaurant ging etwa - konnten die Forscher die meisten Personen in der Datenbank reidentifizieren.







# Dropbox





by Google

# Middle Fork Lands Protected

In the last issue of the Middle Fork Snoqualmie River Valley, another 14 acres have been protected by King County.

"This is an important acquisition. Twenty years ago we didn't know what would become of the Middle Fork. Most of the lower valley was in private ownership and starting to be carved up into cabin sites. Shooting, dumping, and erosion was the norm," says Doug Schindler, Deputy Director of the Greenway Trust. "Today, through the hard work of many, most of the 190,000-acre valley is in public ownership and the area is cleaned up and safe for families. This property is one of the last holdings we have been trying to acquire for 15 years."

17%



This view looks north over Calford Lake toward Mount Index on the Middle Fork Snoqualmie River Valley. Lands in this area went to the Alpine Lakes Wilderness have been acquired over the past 20 years by the Washington State Department of Natural Resources.

Page 2

## Middle Fork News:

- The Washington State Department of Natural Resources received a grant to design a trailhead and trails in the area of the new acquisition.
- The Federal Highway Administration is working to secure funds to pave about 10 miles of the Middle Fork Road. The project aims to improve public access and safety, replace more fall-blocking stone culverts, and significantly increase trail and sidewalk usage during winter.

The State Board of Natural Resources just approved adding several thousand acres of State Forest land in the valley into the Mount Index Natural Resources Conservation Area.

2 of 8

amazon kindle

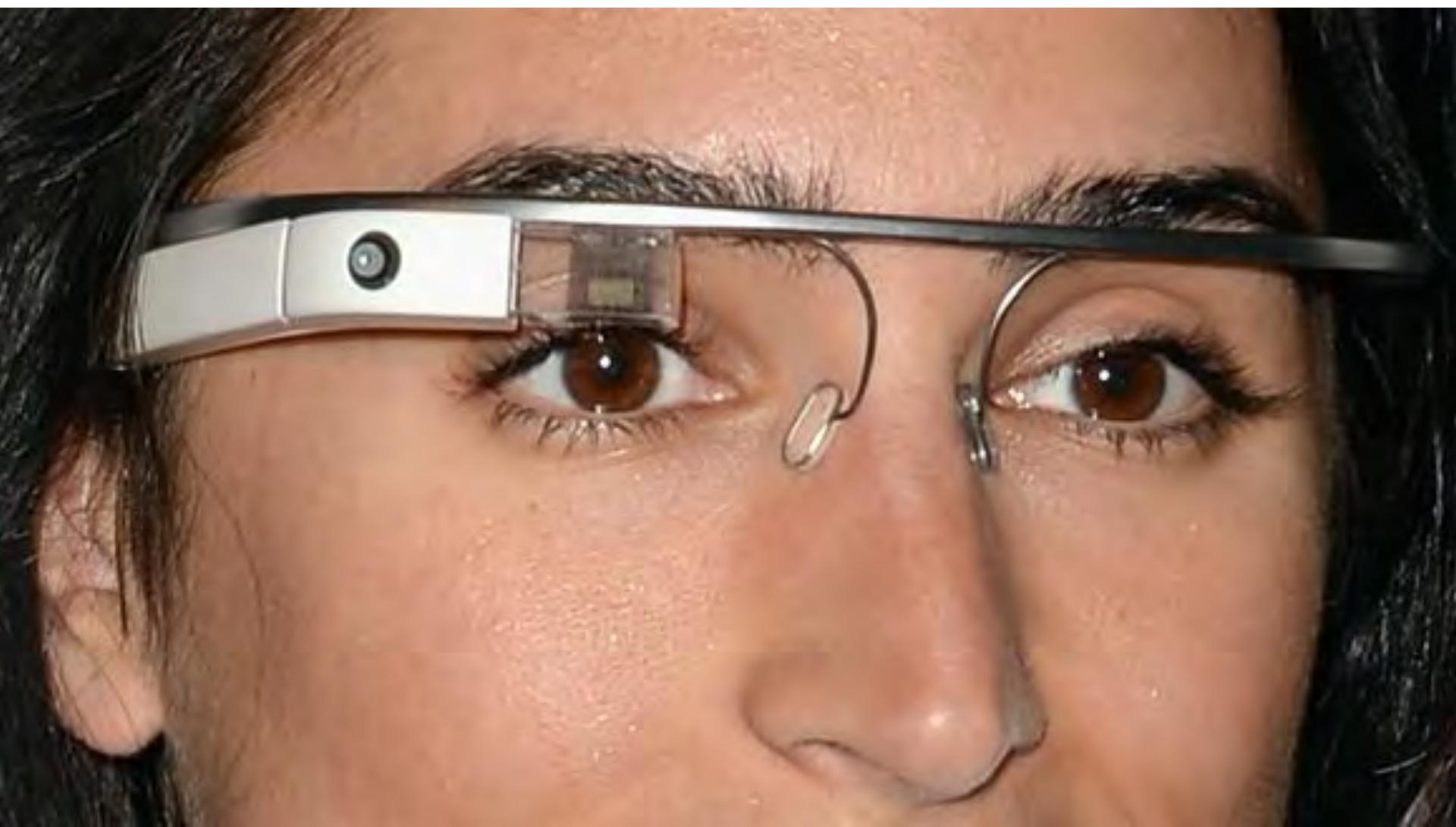
# Google

Google Search

I'm Feeling Puzzled







# I'M WATCHING YOU



# Der Spion, der aus dem Fernseher kommt

TV-Geräte der neuen Generation sind mit dem Internet verbunden. Was viele zu Hause nicht wissen: Manche Hersteller beobachten die Zuschauer beim Fernsehen.



# Staubsauger sollen Wohnungen für Apple und Google vermessen

Der Roboter-Spezialist iRobot will gesammelte Daten verkaufen. Und Microsofts Paint wird nicht verschwinden.



**1 | 4** **Vermessen:** Der Roboterstaubsaugerhersteller iRobot möchte künftig nicht nur Staub saugen, sondern auch Wohnungen und Häuser kartografieren und die gesammelten Daten Firmen wie Google, Apple oder Amazon verkaufen. Diese Pläne verkündet der Firmenchef in einem [Reuters-Artikel](#). Die drei Techkonzerne seien Fans dieser Idee. Offiziell äusserte sich allerdings keiner der drei. ([4 Bilder](#))



## Die Redaktion auf Twitter

Stets informiert und aktuell. Folgen Sie uns auf dem Kurznachrichtendienst.

 @tagesanzeiger folgen

# Überwachung via Rauchmelder Bundesnetzagentur warnt vor versteckten Mini-Kameras

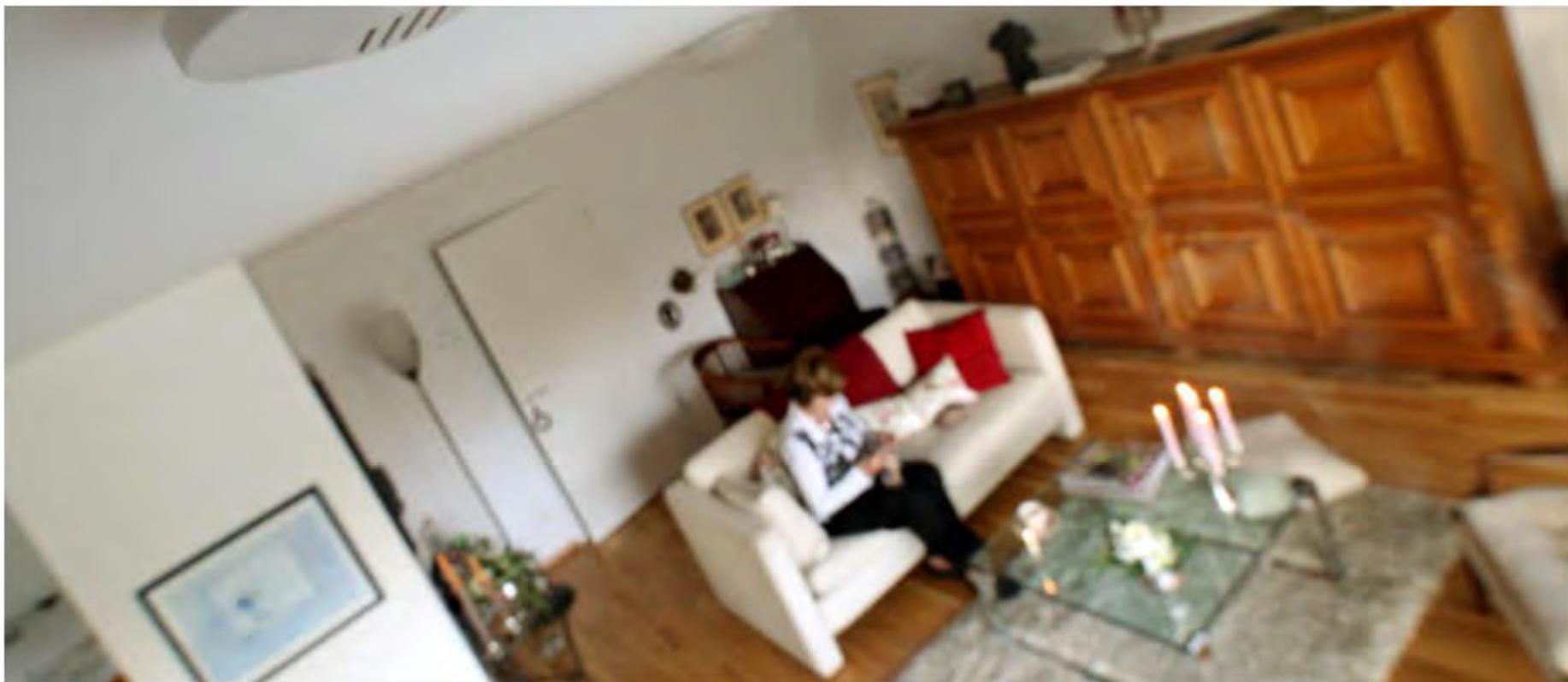
⌚ 25.04.16, 19:22 Uhr

✉ EMAIL

✉ FACEBOOK

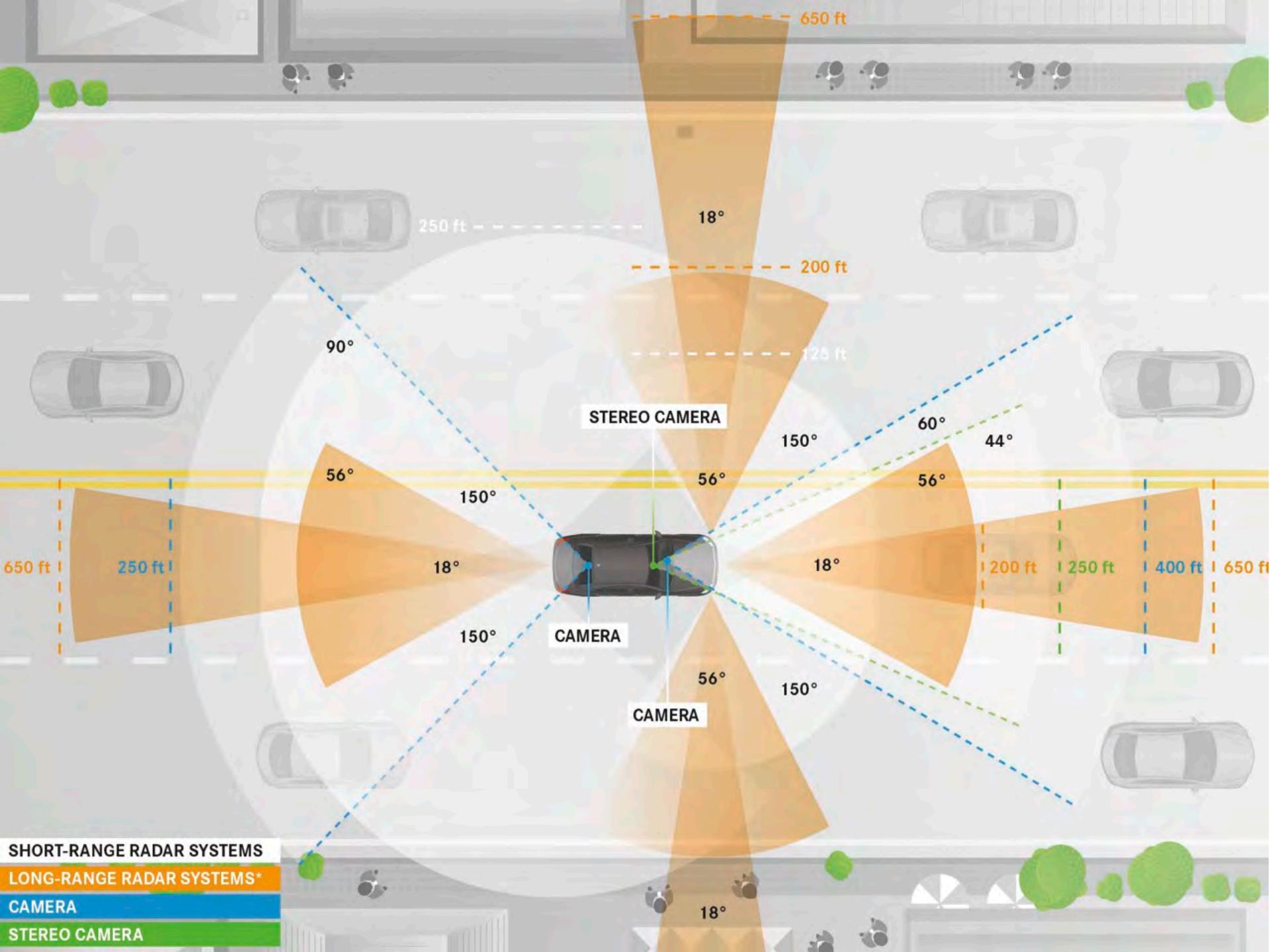
✉ TWITTER

✉ MESSENGER



Die Netzagentur warnt Spionen im eigenen Wohnzimmer.

Foto: dpa



# Der gläserne Fahrer

Autohersteller spionieren ihre Kunden offenbar über ihre Apps aus. Ein Test zeigt: Sie sammeln viel mehr Daten als nötig – und geben diese teils unverschlüsselt weiter.

Von **Martin Sistig**

27. September 2017, 16:02 Uhr / [64 Kommentare](#)

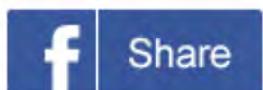


# How your car is SPYING on you: Experts reveal how automakers can track everything from your weight to the food you eat using in-built sensors

- Automakers track data through internet-connected systems in modern cars
- These systems can tell where you eat and shop, or the weather on your street
- Companies collect personal information from millions of vehicles worldwide
- Many of these firms keep tight-lipped about how and when they use this data

By [HARRY PETTIT](#) FOR MAILONLINE 

PUBLISHED: 14:45 BST, 16 January 2018 | UPDATED: 17:34 BST, 16 January 2018



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Experts have revealed the myriad ways that your car can spy on your personal habits.

Automakers track your vehicle's location, how fast you drive, what entertainment you listen to, through internet-connected systems in modern cars.

Newer cars can even record a driver's eye movements, the weight of people in the front seats, the weather on your street, and where you prefer to eat.

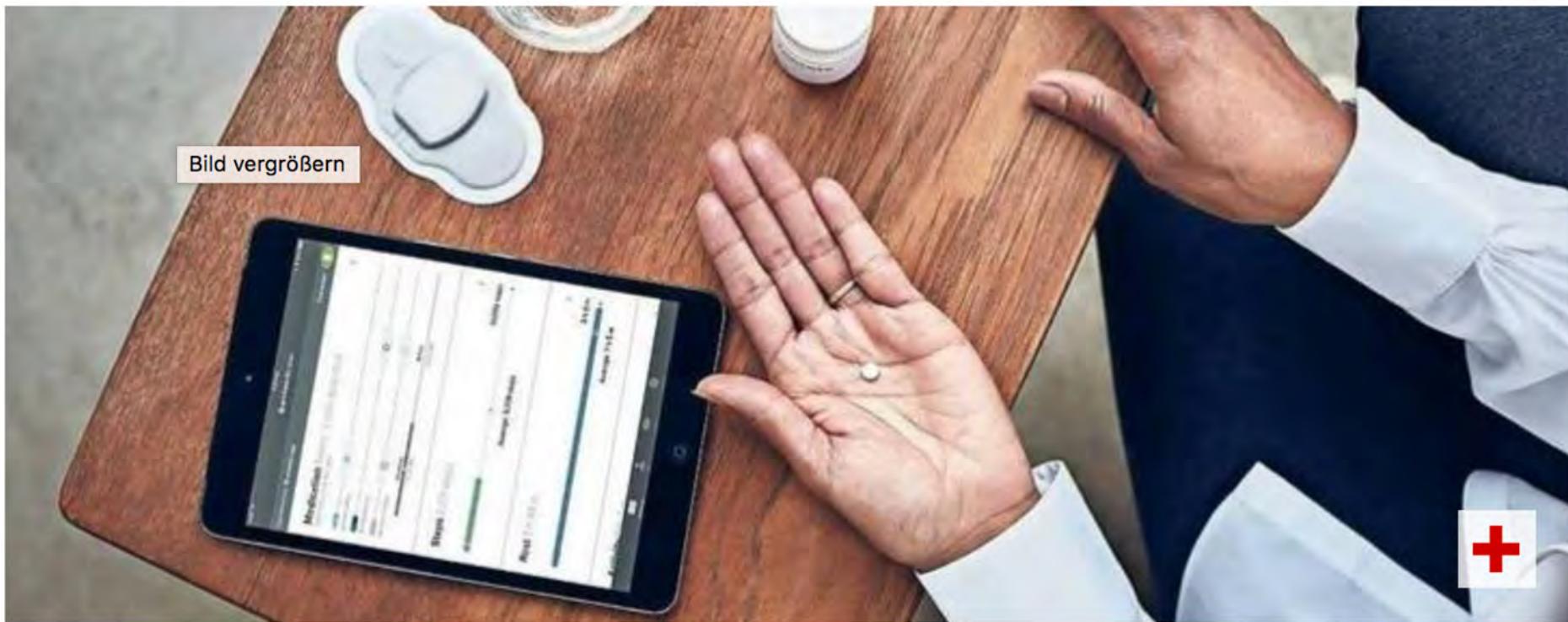
Companies use personal information collected from tens of millions of vehicles around the globe - and many keep tight-lipped about what they use the data for.





# Petzende Pillen

Patienten können jetzt eine digitale Pille schlucken, die den Arzt per Smartphone informiert, ob sie ihre Arzneien einnehmen. VON EDDA GRABAR



„Smarte Pillen“ können Informationen aus dem Darm senden, ob Patienten ihre Medikamente nehmen. Die Daten werden zunächst an ein... FOTO: PROTEUS DIGITAL HEALTH

# Watson wertet Daten von Apple-Nutzern aus

IBM will mit seinem selbst lernenden Computersystem Watson die Gesundheitsdaten von iPhone- und Apple-Watch-Nutzern analysieren – und die Ergebnisse Dritten anbieten.

Von **Patrick Beuth**

14. April 2015, 11:35 Uhr / [12 Kommentare](#)





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DoubleClick  
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Flashtalking  
Google Analytics  
GroupM Server  
INFOline  
Ligatus  
Nugg.Ad  
ScoreCard Research Beac

13. Mai 2012 ☀

Handelsblatt

# Axon Global

## A **Cyber Security, Strategy & Innovation**

company empowering boards and companies to reclaim cyber dominance. If you're an officer of a company and want help protecting valuation, reputation, and critical operations, we're the ones to call.

### **3. Have your reputation, brand, or executives been targeted for social media attack or false news?**

If you would like to know the general sentiment about your brand—based on what is collectively being said in social media—we can tell you. We have the rights to monitor over 64K social media providers (including all the major ones you would recognize). We deliver a report with details about who, what, where, and how people feel and also identify if there is critical mass forming toward social engineering for an escalated attack. We often detect bad actors in the reconnaissance phase, conducting cyber espionage or simply using false news to disparage their target. We deliver the report with advice on how to intercept it and in extreme cases, advise how to implement alternative services to stop it.

# "Wir können alles mitlesen, was Sie eintippen"

Sicherheitslücken in Chips gefährden Milliarden Computer und Handys. Einer ihrer Entdecker sagt, wie gefährlich das ist und was Nutzer tun sollten. Ein Interview. von OLIVER VOSS



Sicherheitsexperten der TU Graz haben die Schwachstellen entdeckt. Michael Schwarz, Moritz Lipp, Daniel Gruss  
(v.l.) FOTO: HELMUT LUNGHAMMER/TU GRAZ

Nackt im Netz

02.11.2016 21:27 Uhr

# Die Daten entblößen alles

Millionen deutsche Internet-Nutzer werden ausgespäht. Wie ist zu verhindern, dass intime Daten öffentlich werden? VON SONJA ÁLVAREZ, KURT SAGATZ, CHRISTIAN TRETBAR UND CARSTEN WERNER





Primary Mood



DISAGREE

AGREE

Communication from  
disappointment and sensitivity.  
Need for strong contact.  
Talkativeness from weakness.



**Got it wrong?**

Read these tips & try again



Secondary Mood



DISAGREE

AGREE

Communication difficulties.  
Struggle to express desires.

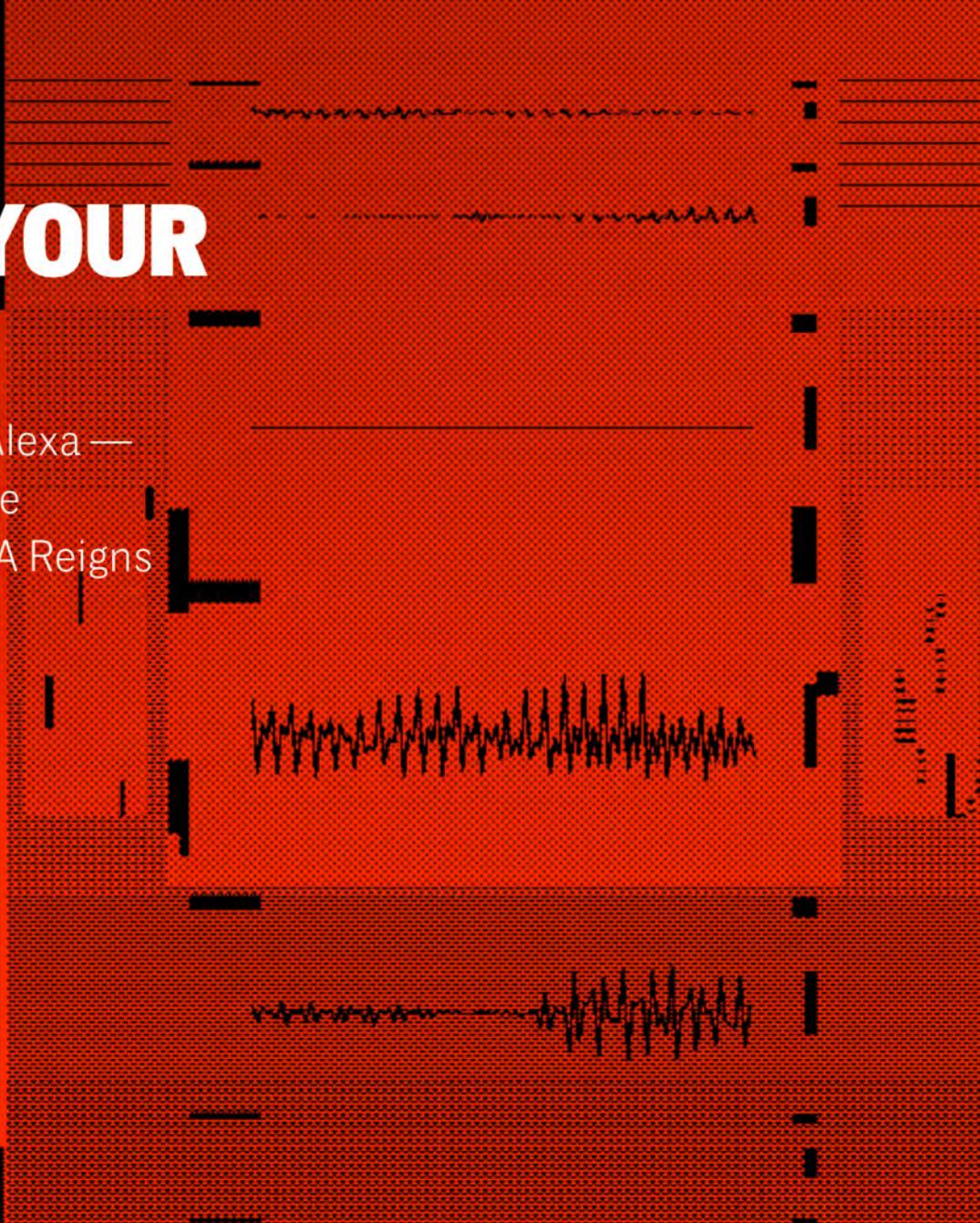
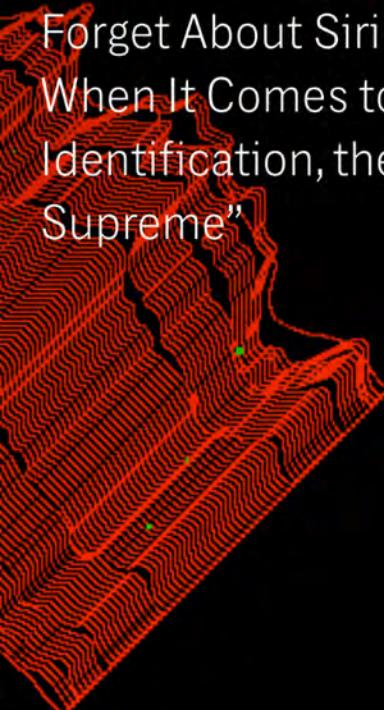


SCIENCE OF  
BEYONDVERBAL  
THE EMOTIONS ANALYTICS COMPANY



# FINDING YOUR VOICE

Forget About Siri and Alexa —  
When It Comes to Voice  
Identification, the “NSA Reigns  
Supreme”



# Google macht die Kamera zum Browser der realen Welt

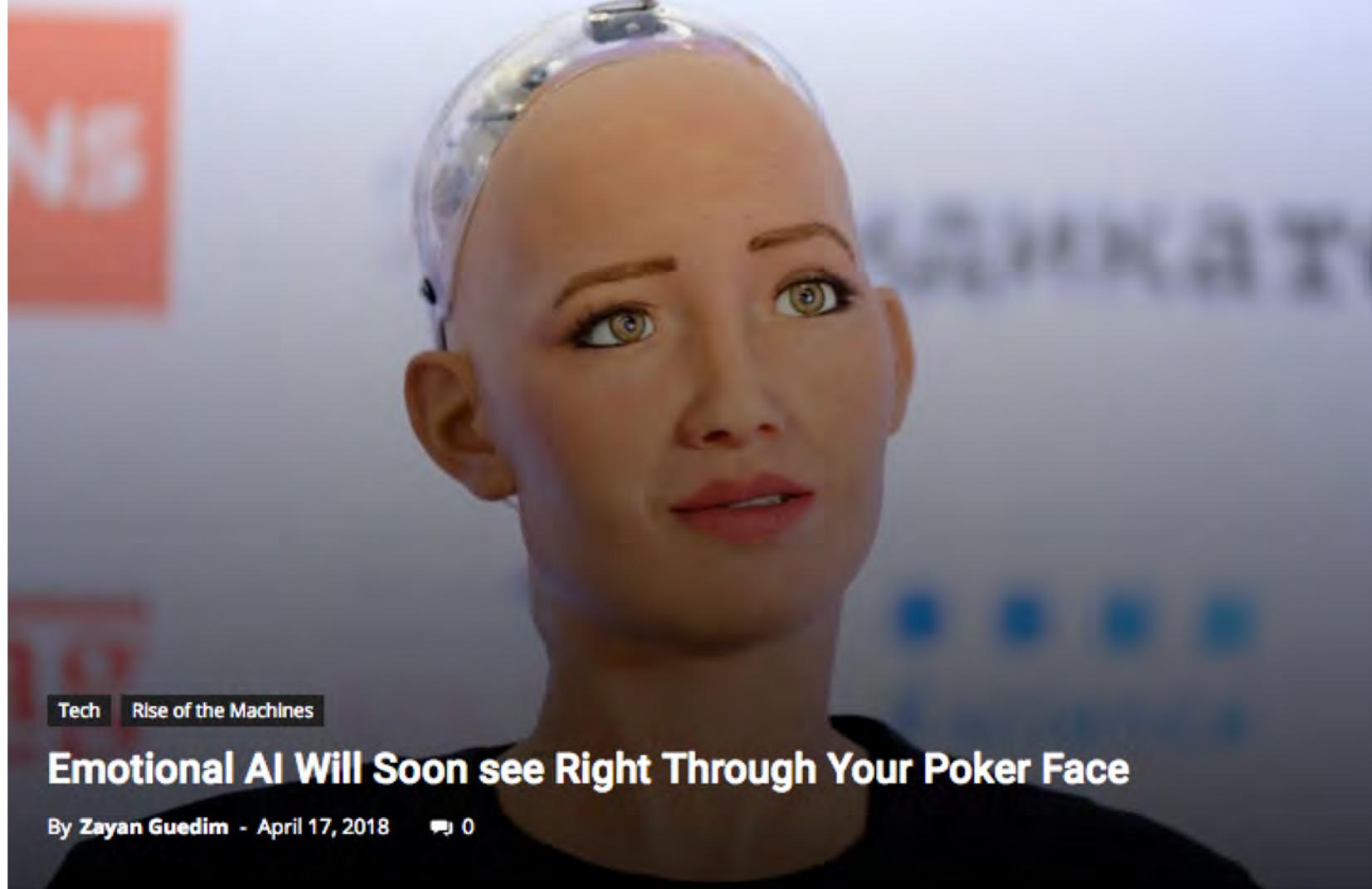
An seiner jährlichen Entwicklerkonferenz präsentiert der Internetkonzern bemerkenswerte Innovationen. Deren Preis sind noch mehr Nutzerdaten.

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Marie-Astrid Langer, Mountain View  
10.5.2018, 09:40 Uhr



Der Google-CEO Sundar Pichai wird an der Entwicklerkonferenz in Mountain View, Kalifornien, wie ein Pop-Star empfangen. (Bild: Reuters / Stephen Lam)



Tech Rise of the Machines

## Emotional AI Will Soon see Right Through Your Poker Face

By Zayan Guedim - April 17, 2018 0



24

G+



in



24  
SHARES

*Beyond current facial recognition systems, intelligent, emotional AI will soon be able to detect, recognize, and track your inner state.*

# New Sensor Monitors Heartbeat From a Distance

By Stephanie Pappas, Live Science Contributor | July 6, 2010 08:28am ET



A new electronic sensor can remotely detect the beat of a human heart from up to 3 feet (1 meter away).



The sensor, developed by researchers at the University of Sussex Innovation Centre, can also detect brain waves from a tenth of an inch (3 millimeters) away from the skull. Researchers hope the technology, called an Electric Potential Sensor, can be used to monitor home healthcare patients remotely, without the need for doctor's appointments or invasive tests. [Read "[7 High-Tech Helpers to Get Fit.](#)"]



MORE ▾

"It's a little bit like the old Star Trek technology, where they kind of wave something over your skin and take your heartbeat," said Peter Lane, an innovation support advisor at the Sussex Innovation Centre.

# Demonstration of long-distance hazard-free wearable EEG monitoring system using mobile phone visible light communication

VEGA PRADANA RACHIM, YUBING JIANG, HYEON-SEOK LEE AND WAN-YOUNG CHUNG\*

*Department of Electronic Engineering, Pukyong National University, Busan 48513, South Korea*

*\*wychung@pknu.ac.kr*

**Abstract:** A wearable electroencephalogram (EEG) is a small mobile device used for long-term brain monitoring systems. Applications of these systems include fatigue monitoring, mental/emotional monitoring, and brain-computer interfaces. However, the usage of wireless wearable EEG systems is limited due to the risks posed by the wireless RF communication radiation in a long-term exposure to the human brain. A novel microwave radiation-free system was developed by integrating visible light communication technology into a wearable EEG device. In this work, we investigated the system's performance in transmitting EEG data at different illuminance level and proposed an algorithm that functions at low illuminance levels for increased transmission distance. Using a 30 Hz smartphone camera, the proposed system was able to transmit 2.4 kbps of error-free EEG data up to 4 meter, which is equal to ~300 lux using an aspheric focus lens.

# Digital Doubles

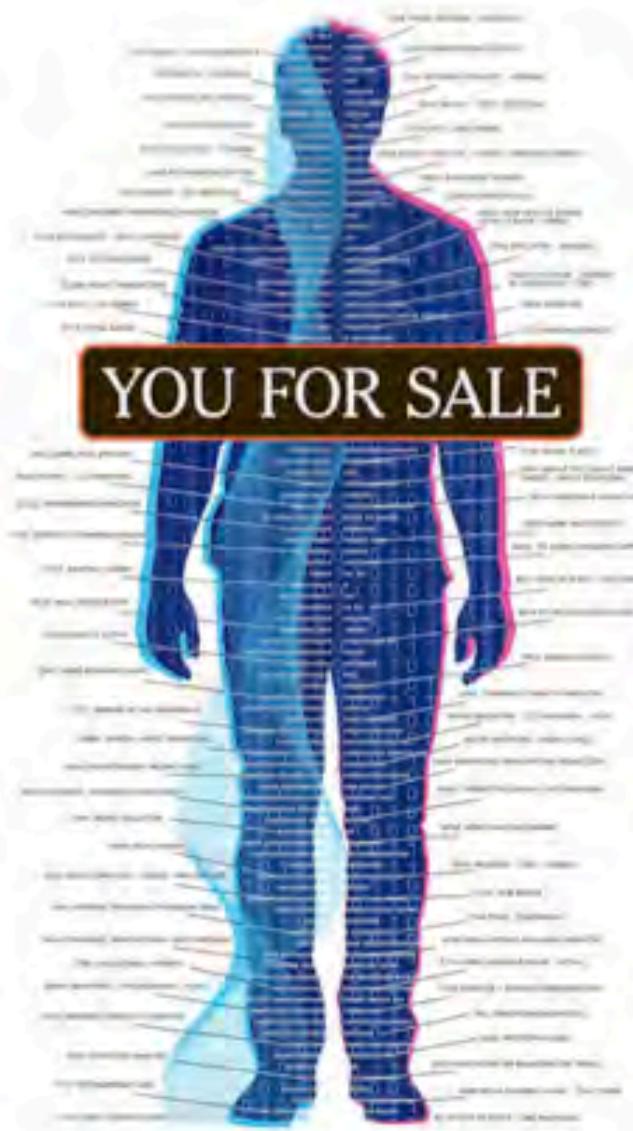
education level

estimated net  
worth

types of recent  
purchases

investments

habits (like  
smoking &  
gambling)



number of kids

contact info

religious & political  
views

marital status

mortgage amount

salary

# Google CEO: "We Know Where You Are. We Know Where You've Been. We Can More Or Less Know What You're Thinking About."

Nick Saint

Oct. 4, 2010, 9:47 AM  14,815



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**GOOG** Alphab Non Vtg Rg-C

 **1,031.79**

**27.23 (+2.70 %)**

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[Disclaimer](#)

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Google CEO Eric Schmidt really has a knack for expressing relatively benign ideas in a way that makes him and his company look incredibly creepy.

The Atlantic [has posted](#) video of the full interview in which Eric talked about 'the creepy line', and it is chock full of unsettling sound bytes. In particular, he had the following to say on privacy:

With your permission, you give us more information about you, about your friends, and we can improve the quality of our searches. We don't need you to type at all. We know where you are. We know where you've been. We can more or less know what you're thinking about.

# CIA Director Gus Hunt

“It is really very nearly within our grasp to be able to compute on all human generated information,” Hunt said.

“You’re already a walking sensor platform,” he said, noting that mobiles, smartphones and iPads come with cameras, accelerometers, light detectors and geolocation capabilities.

[http://www.huffingtonpost.com/2013/03/20/cia-gus-hunt-big-data\\_n\\_2917842.html](http://www.huffingtonpost.com/2013/03/20/cia-gus-hunt-big-data_n_2917842.html)

A NEW WORLD

A new currency

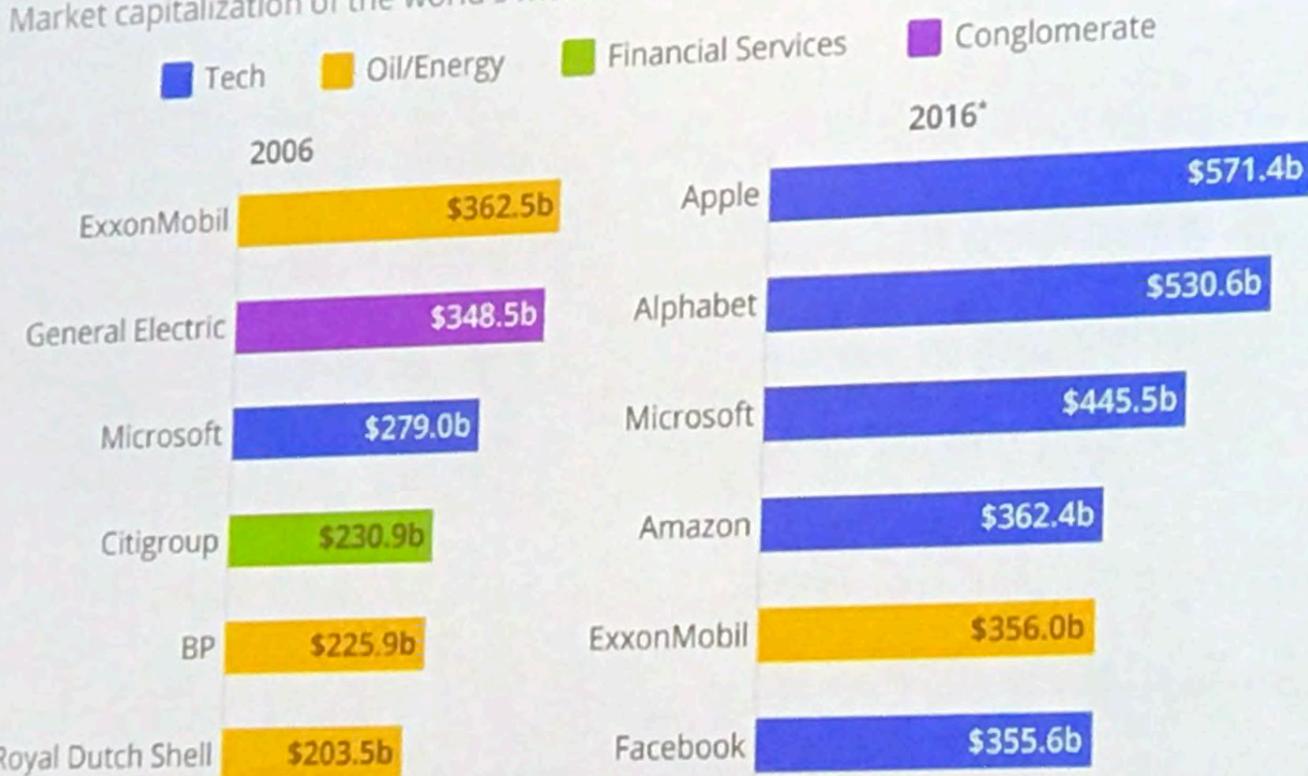
“Data is the new oil” – Clive Humby



# Data really is the new oil

## The Age of Tech

Market capitalization of the world's most valuable public companies



A new economy

# Attention Economy



# A new legal system

# »Code is law.«\*

\* AND LAW ENFORCEMENT IS  
INCREASINGLY BEING ENCODED



*Lawrence Lessig*

CODE, VERSION 2.0 (2006)

That holds true for governments as well: Not only is code law, as Lessig famously put it – increasingly, law enforcement is being encoded, offloaded into software and the infrastructure it operates on.

# Acht Superreiche besitzen angeblich so viel wie die halbe Menschheit

Die globale soziale Ungleichheit ist laut einer Oxfam-Studie offenkundiger als je zuvor: Demnach besitzen die acht reichsten Männer der Welt 426 Milliarden Dollar - und damit mehr als die gesamte ärmere Hälfte der Weltbevölkerung.



Von *Nicolai Kwasniewski* ▾



A new political system

Politik der Algorithmen

# Google will den Staat neu programmieren

Hat man Entscheidungsschwierigkeiten, kann man im Notfall natürlich auch zum Würfel greifen. Doch wie wäre es, wenn Politiker nach Googles Algorithmen entschieden? Der Konzern probiert es in Amerika aus.

14.10.2015, von ADRIAN LOBE



# Could Society Be Run Like A Giant Machine?



# Diese Firma weiss, was Sie denken

Cambridge Analytica kann mit einer neuen Methode Menschen anhand ihrer Facebook-Profile minutiös analysieren. Und verhalf so Donald Trump mit zum Sieg.



Alexander Nix erklärt die Methode seiner Firma (Quelle: Youtube/Concordia).

Am 9. November gegen 8.30 Uhr erwacht Michal Kosinski in Zürich im Hotel Sunnehus. Der 34-jährige Forscher ist für einen Vortrag am Risikocenter der ETH angereist, zu einer Tagung über die Gefahren von Big Data und des sogenannten digitalen Umsturzes. Solche Vorträge hält Kosinski ständig, überall auf der Welt. Er ist ein führender Experte für Psychometrik, einen datengetriebenen Nebenzweig der Psychologie. Als er an diesem Morgen den Fernseher einschaltet, sieht er, dass die Bombe geplatzt ist: Entgegen den Hochrechnungen aller führenden Statistiker ist Donald J. Trump gewählt worden.

**ZÜRITIPP**  
Alles über die Region Zürich  
Veranstaltungskalender, Ne



**Hunger?**  
Finde hier Restaurants in de



**sich-erinnern.ch**  
Das Trauerportal von Tages-

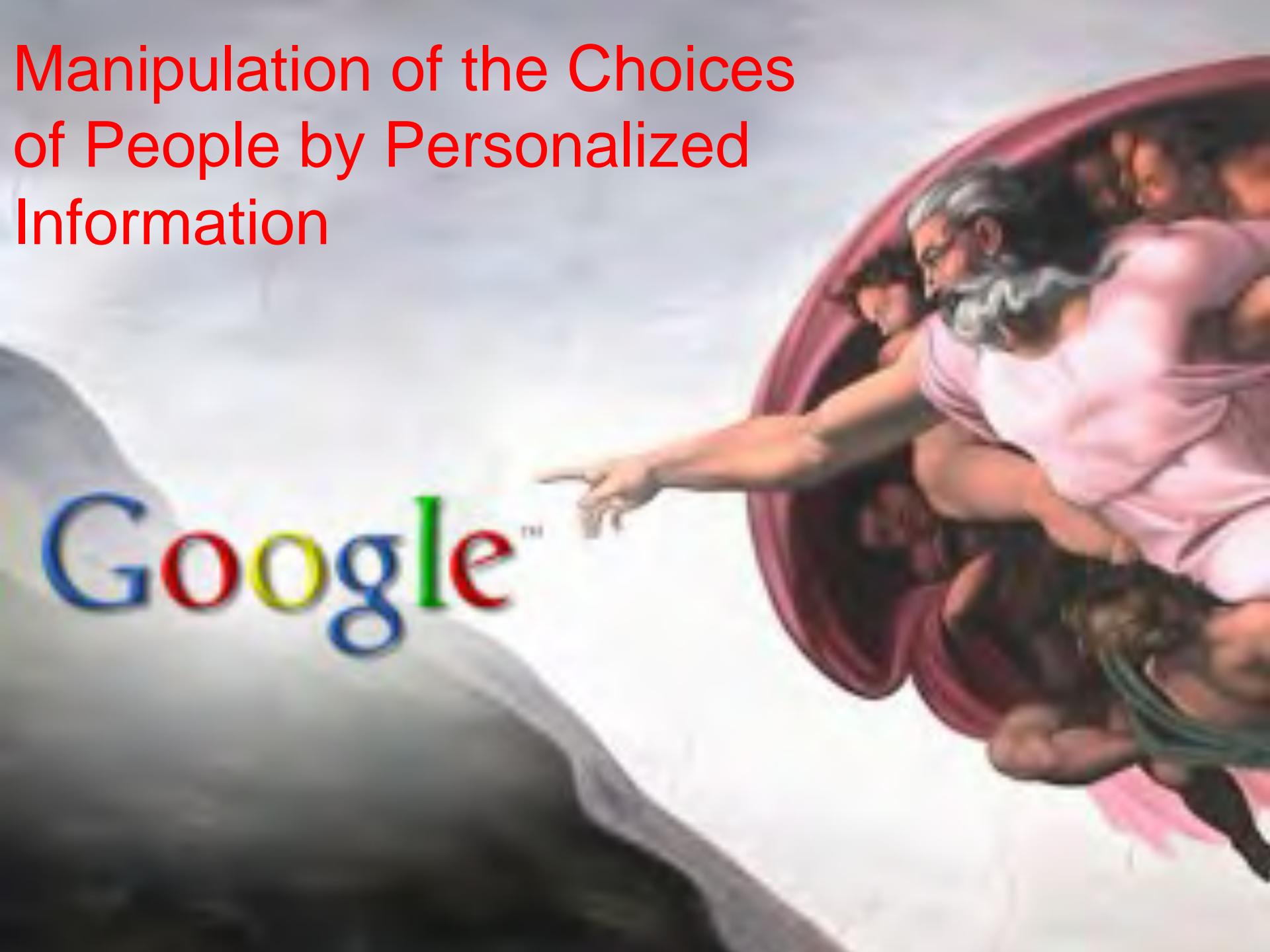
## Artikel zum Thema

**«Cambridge Analytica ble jeden Beweis schuldig»**

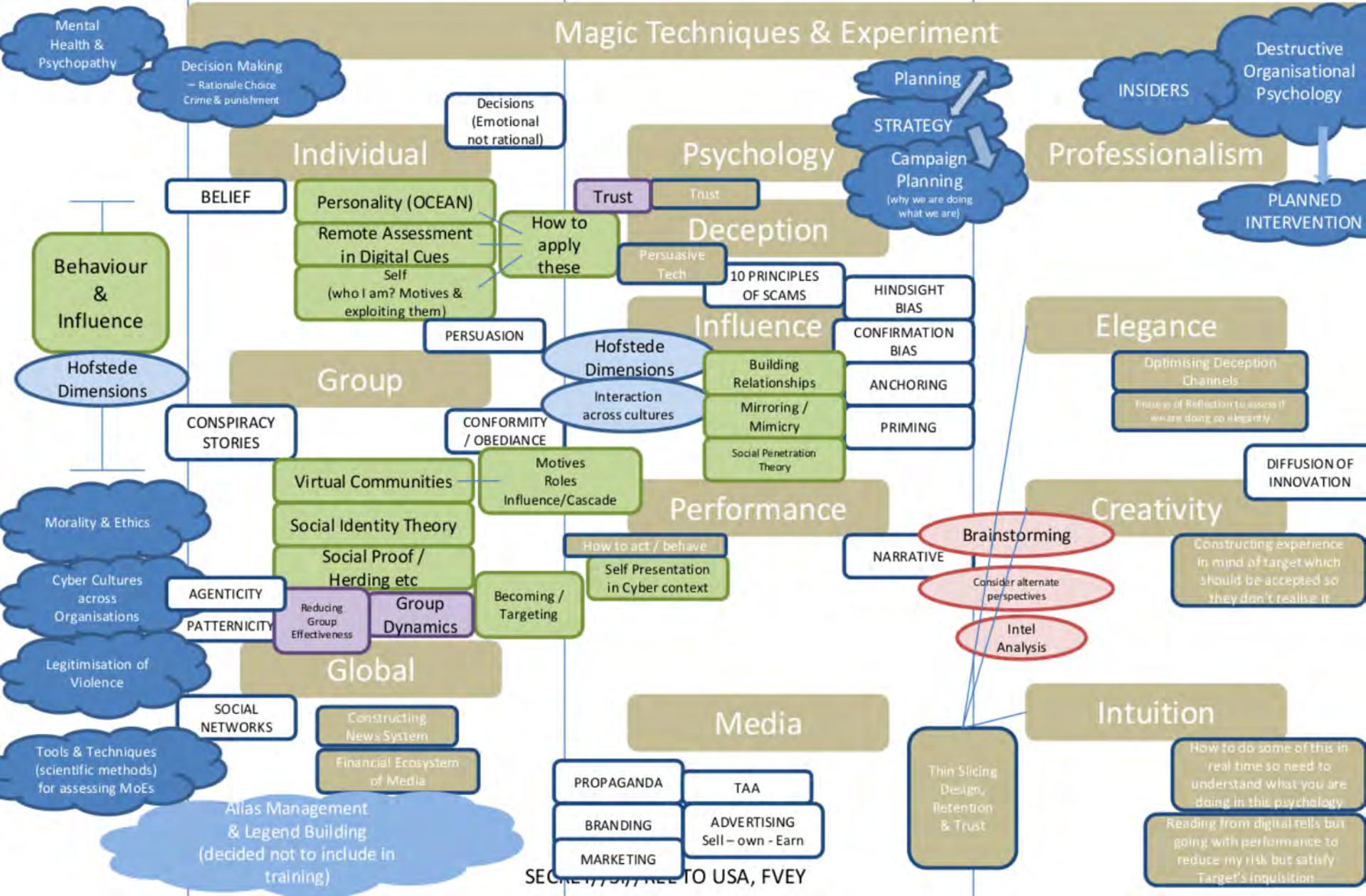


“Bald kann sein Modell anhand von zehn Facebooks-Likes eine Person besser einschätzen als ein durchschnittlicher Arbeitskollege. 70 Likes reichen, um die Menschenkenntnis eines Freundes zu überbieten, 150 um die der Eltern, mit 300 Likes kann die Maschine das Verhalten einer Person eindeutiger vorhersagen als deren Partner. Und mit noch mehr Likes lässt sich sogar übertreffen, was Menschen von sich selber zu wissen glauben.”

# Manipulation of the Choices of People by Personalized Information





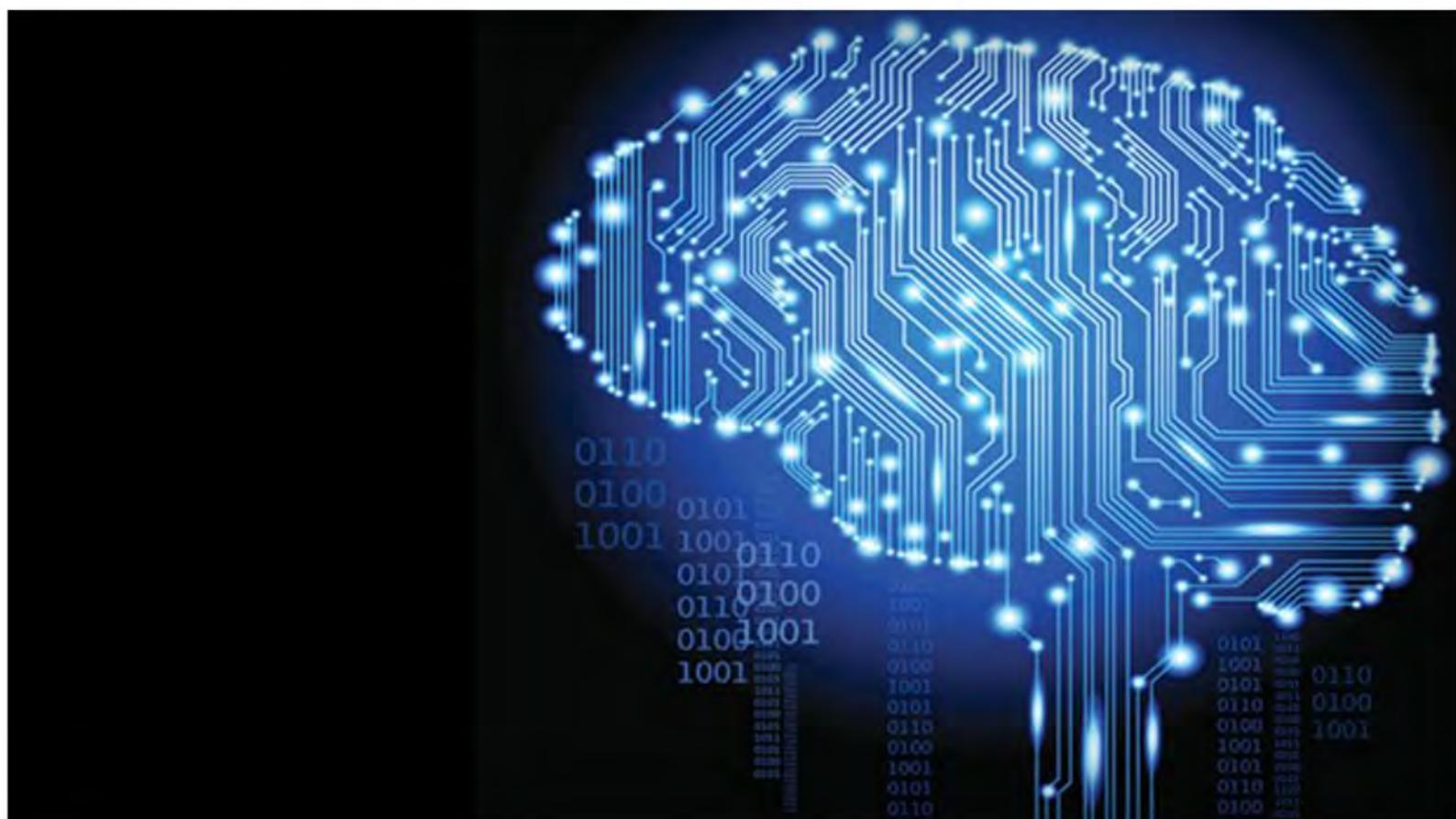


# Meet the weaponized propaganda AI that knows you better than you know yourself

By Jessica Hall on March 1, 2017 at 8:42 am | [0 Comments](#)



1.3K SHARES





# Tristan Harris: Mass Mind Control



How a handful of tech companies control billions of minds every day | Tristan Harris

258,580 views

1K 6K 237 SHARE

THOMAS R. KÖHLER



Kai Schlieter



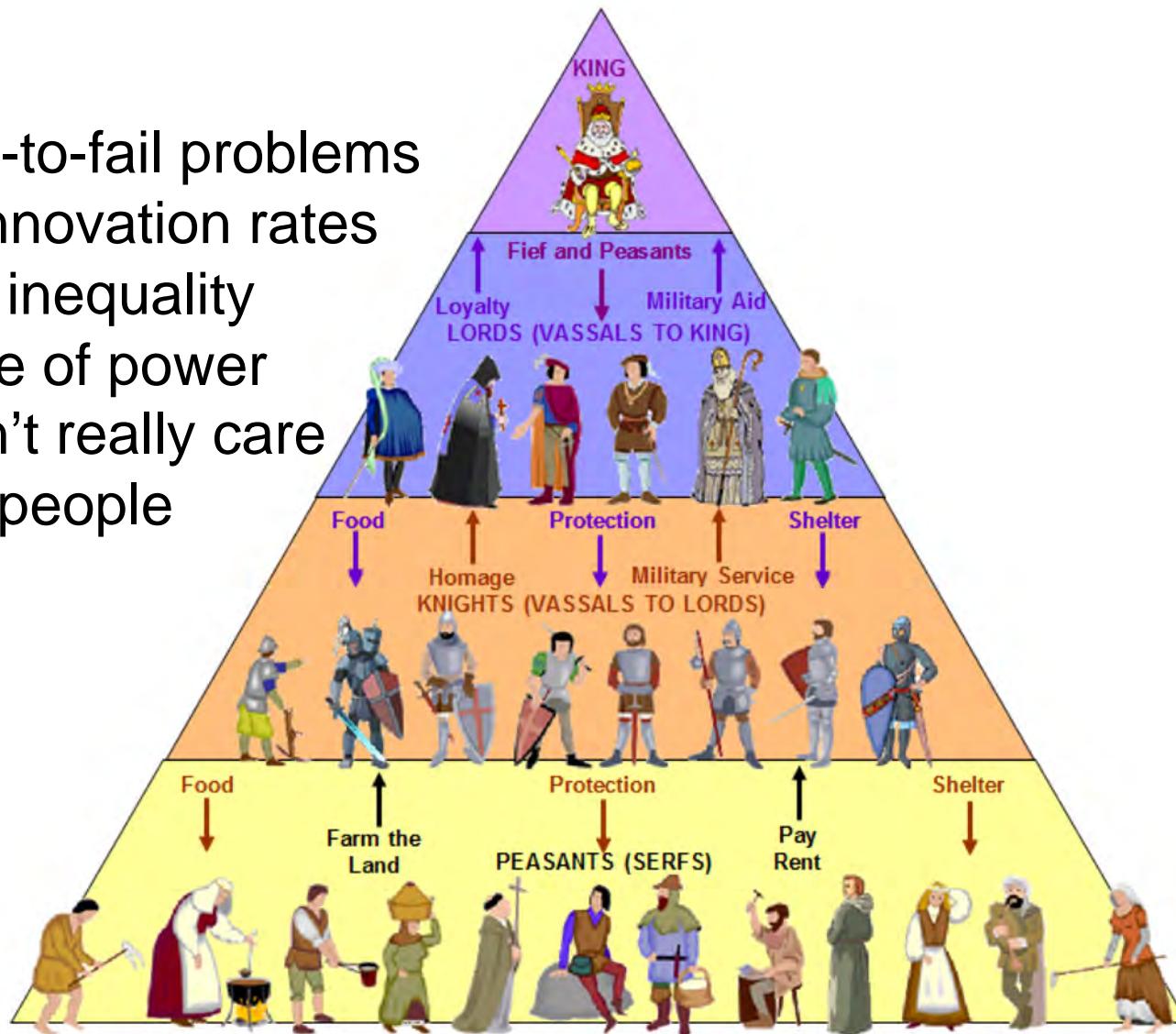
# Fascism 2.0: Big Brother, Brave New World



- Top-down decision-making
- Average behavior sets the norm
- Government determines value of people
- Discrimination of minorities, euthanasia, war

# Feudalism 2.0: Big Other (Surveillance Capitalism)

- To-big-to-fail problems
- Low innovation rates
- Large inequality
- Misuse of power
- Doesn't really care about people



# Communism 2.0: Big Mother, Benevolent Dictator

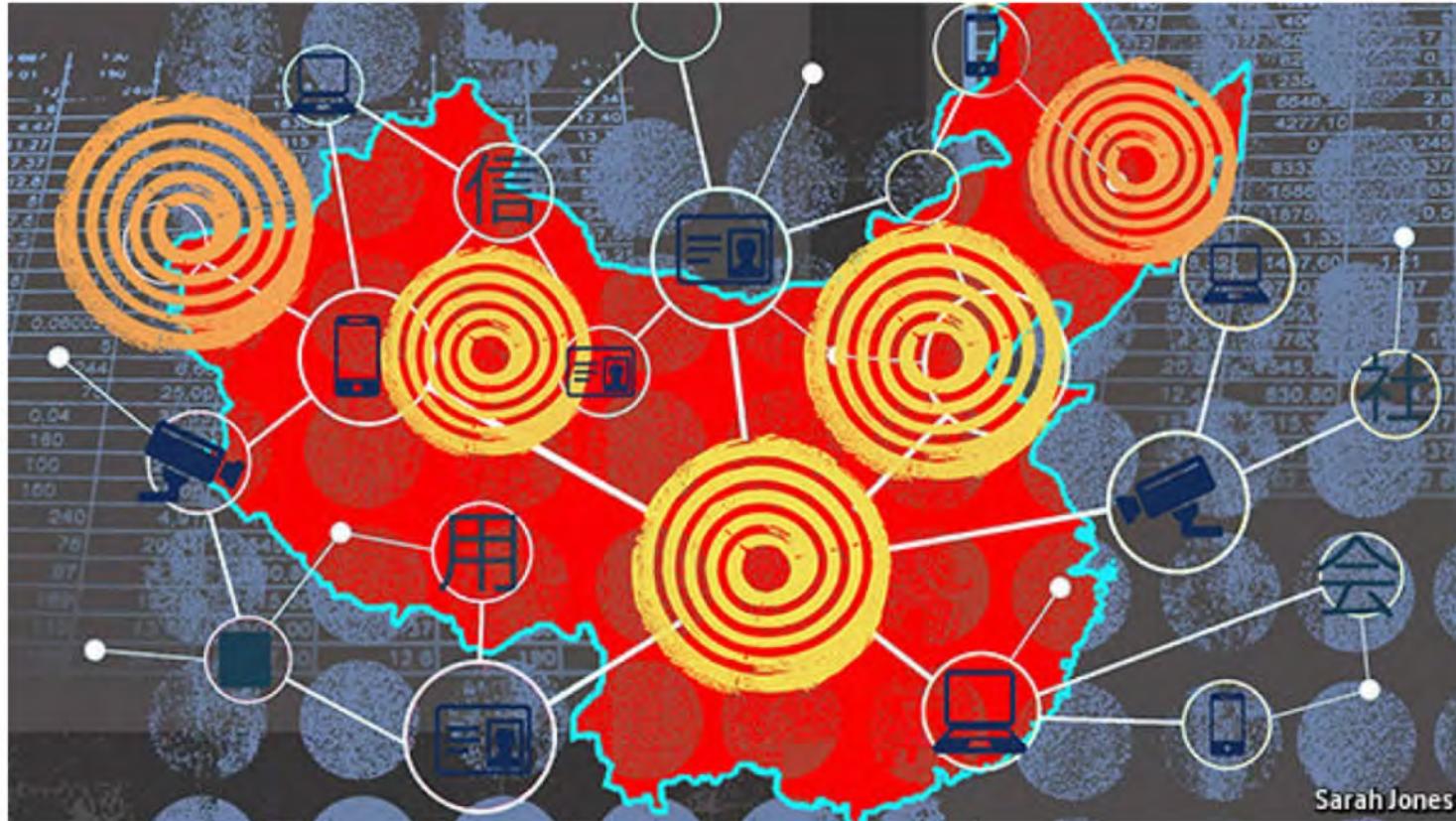


- Top-down planning
- Goals set by the government
- Redistribution of wealth
- Scarce resources rationed

Big data, meet Big Brother

# China invents the digital totalitarian state

*The worrying implications of its social-credit project*

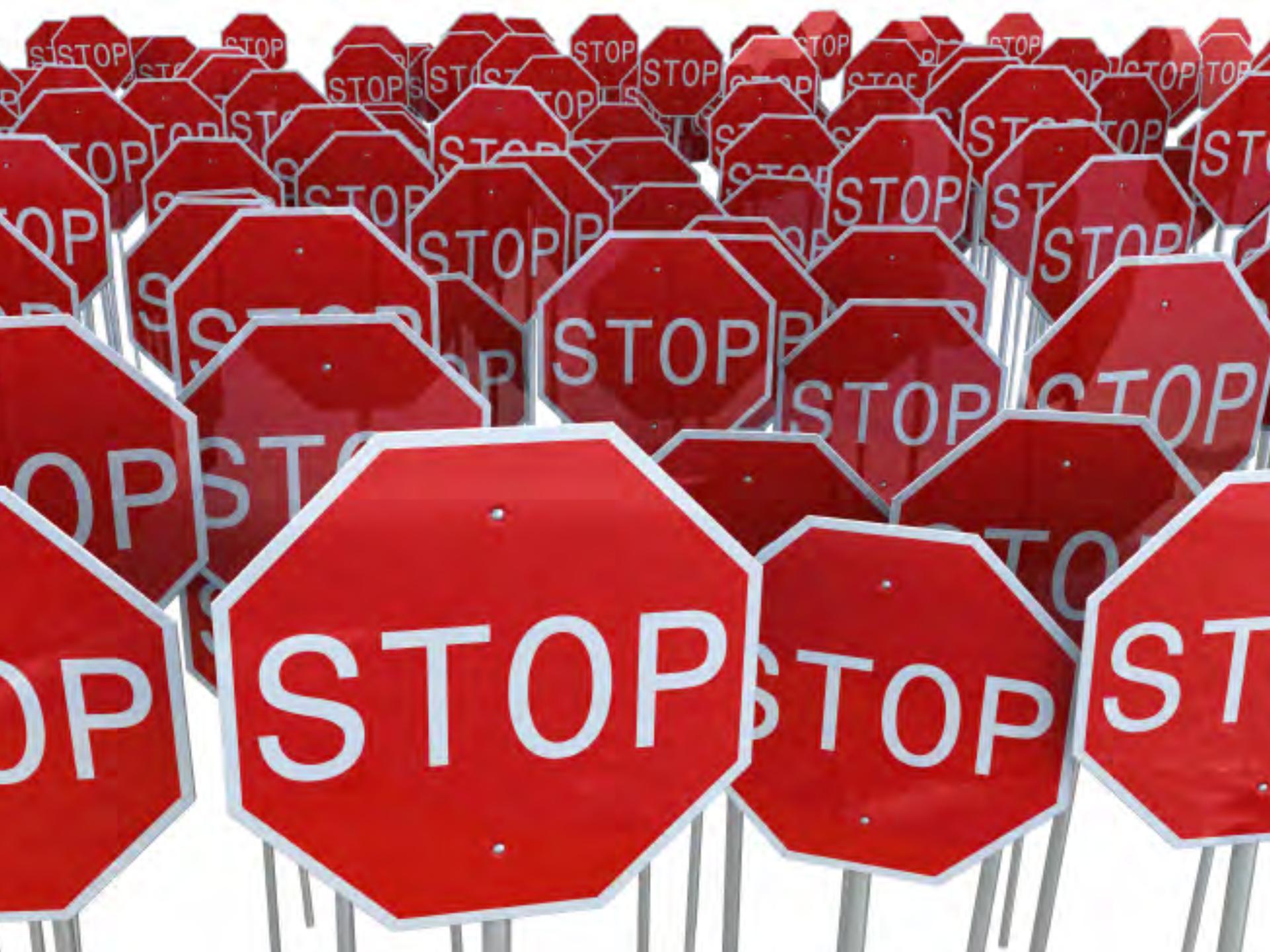


# Technologischer Totalitarismus

Eine Debatte  
Herausgegeben von

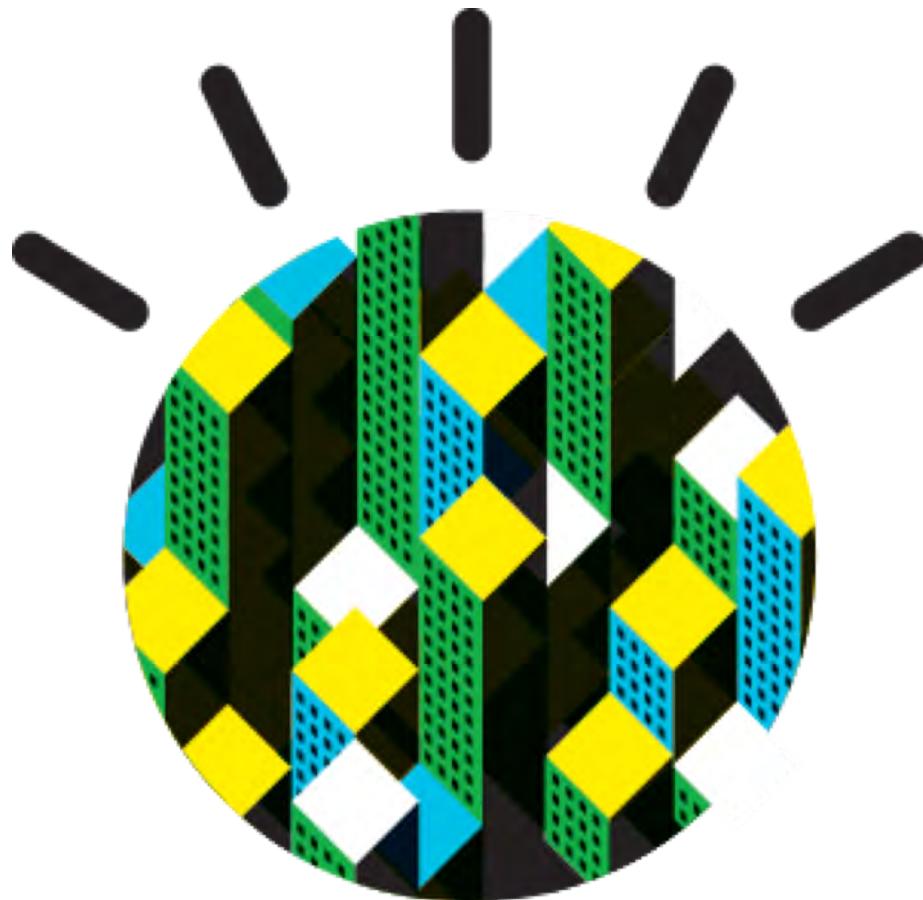
Frank Schirrmacher  
edition suhrkamp





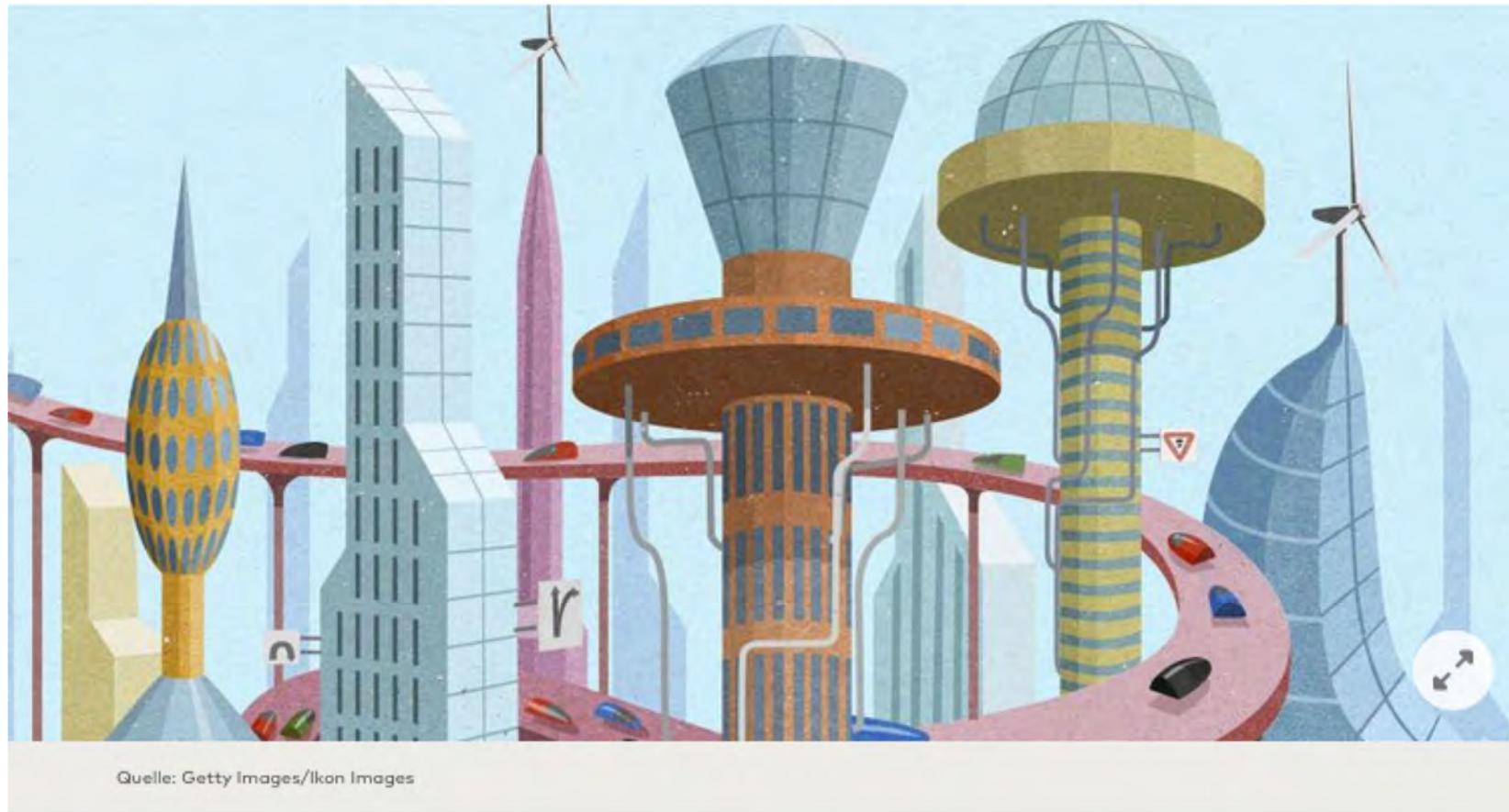
**It does not work well!**

# Automated Smart Cities, Smart Nations?



# Googles smarte Stadt, ein digitaler Alptraum

Von Henryk M. Broder | Stand: 28.10.2017 | Lesedauer: 3 Minuten



Quelle: Getty Images/Ikon Images

Google will in Toronto ein voll vernetztes Testfeld für das Leben von morgen errichten: Eine Stadt vom Reißbrett, total vernetzt und überwacht wie eine moderne Justizvollzugsanstalt. Unserem Autor gruselt es.

[SUBSCRIBE](#)[THE SCIENCES](#) [MIND](#) [HEALTH](#) [TECH](#) [SUSTAINABILITY](#) [EDUCATION](#) [VIDEO](#) [PODCASTS](#) [BLOGS](#) [STORE](#)**ENERGY**

What 4 Million Solar Panels Look Like from Space

February 23, 2017 — Brian Kahn and Climate Central

VX Nerve Agent in North Korean's Murder: How Does It Work?

February 24, 2017 — David Bradley and ChemistryWorld

**POLICY & ETHICS**

# Will Democracy Survive Big Data and Artificial Intelligence?

**ARTS & CULTURE**

Why Is It Significant That the White House Tours Resume?

11 hours ago — Krystal D'Costa

**ARTS & CULTURE**

Readers Respond to the November 2016 Issue

15 hours ago

**EVOLUTION**

Paleo Profile: Mauricio Fernández's Plesiosaur

13 hours ago — Brian Switek

**EVOLUTION**

Fossil Pigments Reveal the True Colors of Dinosaurs



Report

## **Disrupting cities through technology**

Thursday 17 – Saturday 19 March 2016 | WP1449

# The Cities with Highest Quality of Life Are Not in the Leading IT Nations

Mercer's 2015 Quality of Living Rankings<sup>[2]</sup>

	<b>City</b>	<b>Country</b>
1	Vienna	 Austria
2	Zürich	 Switzerland
3	Auckland	 New Zealand
4	Munich	 Germany
5	Vancouver	 Canada
6	Düsseldorf	 Germany
7	Frankfurt	 Germany
8	Geneva	 Switzerland
9	Copenhagen	 Denmark
10	Sydney	 Australia

# Critical Thinking

# Digital Literacy and Digital Enlightenment



Aufklärung ist der Ausgang des Menschen aus seiner selbstverschuldeten Unmündigkeit. Unmündigkeit ist das Unvermögen, sich seines Verstandes ohne Leitung eines anderen zu bedienen. Selbstverschuldet ist diese Unmündigkeit, wenn die Ursache derselben nicht am Mangel des Verstandes, sondern der Entschließung und des Mutes liegt, sich seiner ohne Leitung eines anderen zu bedienen. Sapere aude! Habe Mut, dich deines eigenen Verstandes zu bedienen! ist also der Wahlspruch der Aufklärung.

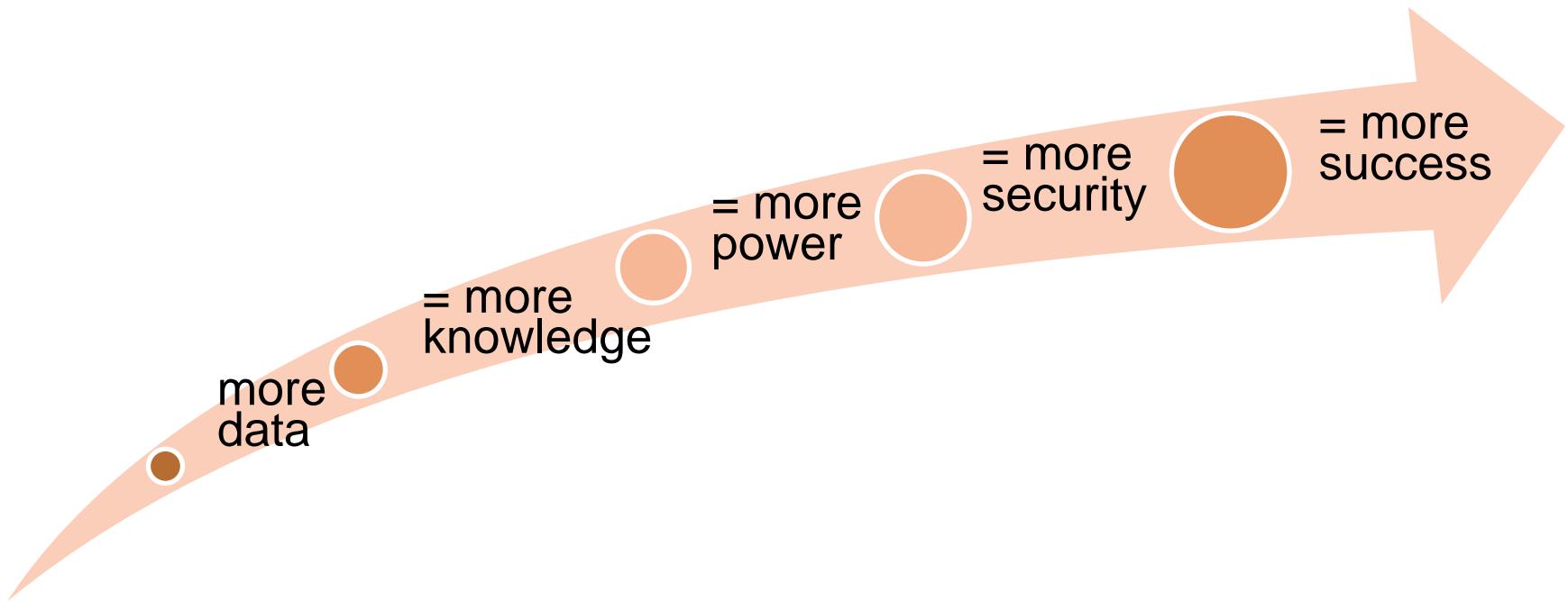
(Immanuel Kant)

# What the Concept of a Data-Driven and AI-Controlled Society Lacks

- Human Dignity
- Love
- Consciousness
- Freedom
- Everything that cannot  
be well quantified

More data = more  
knowledge?

# The Magic Formula ...



...does not work!

$x$ =Nicolas Cage films

$y$ =Swimming pool drownings

$x$ =Divorces in Maine

$y$ =Margarine consumption

# Spurious correlations

CORRELATION DOES NOT EQUAL CAUSATION

$x$ =Cheese eating

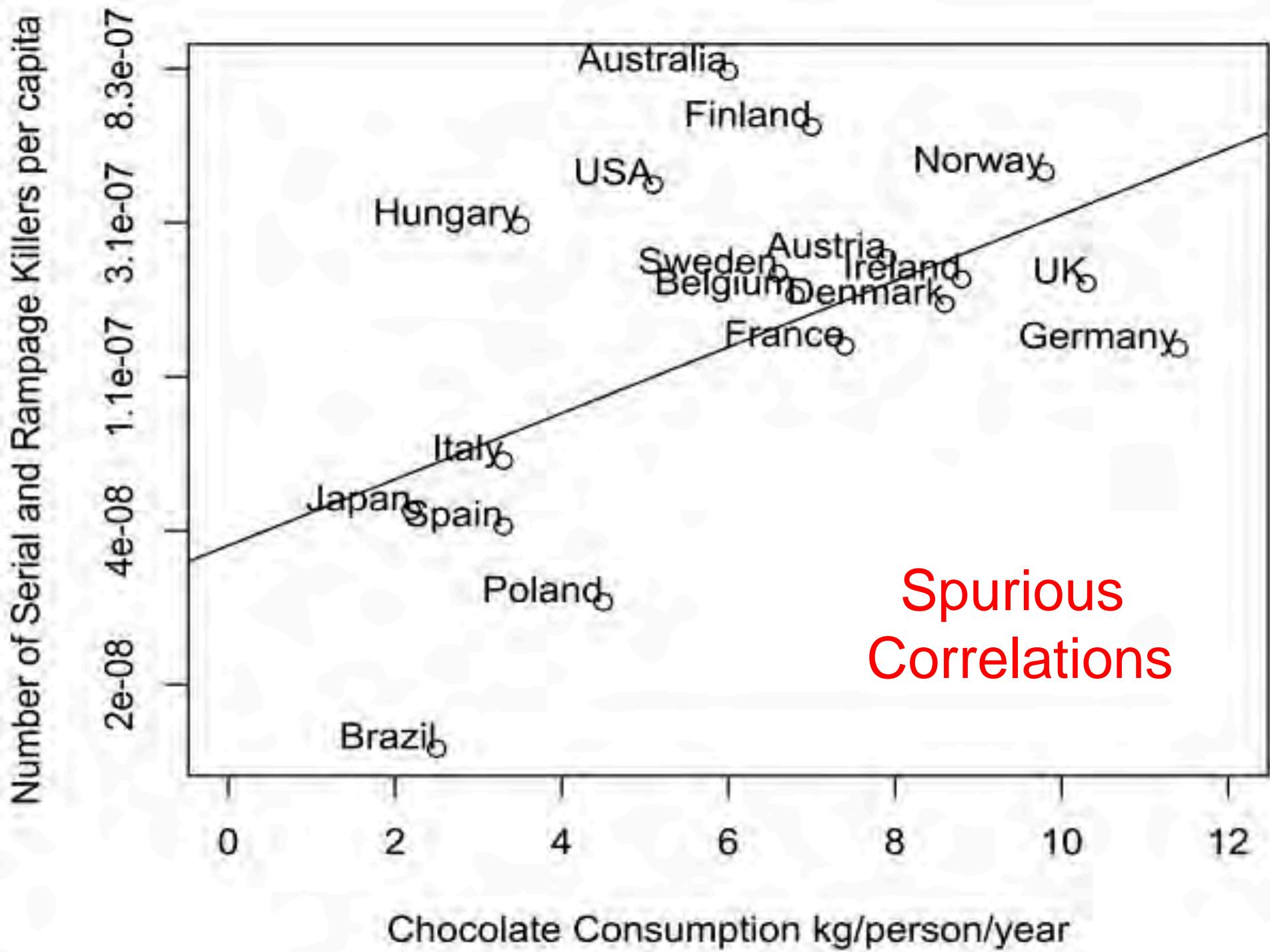
$y$ =Infant near dangles

TYLER VIGEN



$x$ =Shark attacks

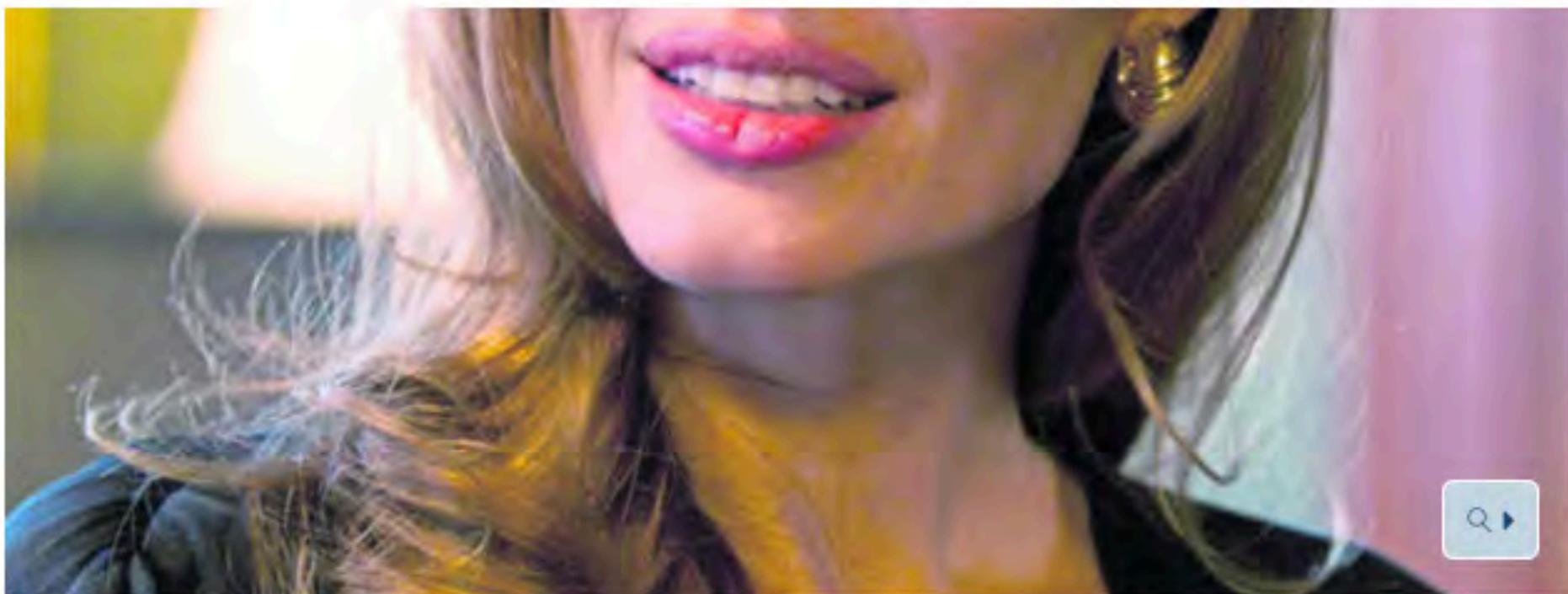
$y$ =Tornadoes







# Jolie: "Wissen ist Macht"



Die amerikanische Schauspielerin Angelina Jolie, mit ihrem Kollegen Brad Pitt verheiratet, will dem Krebs zuvorkommen. Deshalb ließ sich die 39-Jährige nach ihren Brüsten jetzt auch die Eierstöcke entfernen. Bei ihr wurde ein mutiertes Gen diagnostiziert, das für sie das Risiko, an Krebs zu erkranken, deutlich erhöht. Bild: dpa

**Angelina Jolie über ihre Brust-Amputation**

# «Ich bin Trägerin eines defekten Gens»

Angelina Jolie hat eine drastische Massnahme ergriffen. Die Schauspielerin liess sich aus Angst vor Krebs beide Brüste entfernen.



# Angelina Jolie lässt sich beide Brüste amputieren

Hollywood-Schauspielerin Angelina Jolie hat sich vorsorglich ihre Brüste abnehmen lassen. Grund ist ihre Angst vor einer Krebserkrankung. Schon ihre Mutter starb einst im Alter von 56 Jahren daran.

58



Twittern

G+1

2

Von Caroline Stern  
Autorin WELT-Gruppe



Video teilen

Twittern

G+1

0

Auto Start: an | aus

Die Schauspielerin Angelina Jolie hat sich beide Brüste amputieren lassen. Das gab die Schauspielerin selbst in einem Beitrag in der "New York Times" bekannt. So wollte sie ihr Risiko minimieren.

Quelle: Reuters

# Angelina Jolie taugt nicht als Vorbild

Kaum eine Frau sollte sich vorsorglich aus Angst vor Krebs die Brüste entfernen lassen. Angelina Jolies Weg ist nur für die wenigsten eine Option.

Von **Sven Stockrahm**

14. Mai 2013, 20:14 Uhr / Aktualisiert am 14. Mai 2013, 20:46 Uhr

Die Schauspielerin Angelina Jolie

*Die Schauspielerin Angelina Jolie © Dan Kitwood/Getty Images*

## INHALT

[Seite 1 — Angelina Jolie taugt nicht als Vorbild](#)

[Seite 2 — Jeder Krebs ist einzigartig](#)

[Auf einer Seite lesen >](#)

Angelina Jolie ist vielleicht dem Trugschluss erlegen, sie könne sich dafür entscheiden, nicht krank zu werden. Die Schauspielerin hat sich beide Brustdrüsen entfernen lassen, damit kein Tumor darin zu wuchern beginnen kann. Geblieben sind ihr Haut und Brustwarzen, die sich nun über zwei Silikonimplantate spannen. In der New York Times schreibt Jolie: "Das

Leben birgt viele Herausforderungen. Diejenigen, die uns keine Angst machen sollten, sind auch diejenigen, die wir annehmen und kontrollieren können."

Kommentieren (1) 

Brustkrebs-Screening

## Wissenschaftler zweifelt am Sinn

**MÜNCHEN.** Deutliche Zweifel am Nutzen von Screeningprogrammen hat der Berliner Wissenschaftler Professor Gerd Gigerenzer geäußert. Statt das Geld etwa in das Mammografiescreening zu stecken, sollte besser die [Prävention](#) gestärkt werden, erklärte der Direktor am Berliner Max-Planck-Institut für Bildungsforschung beim BKK Tag 2013 in München.



Kommentieren (0)

Von tausend Frauen, die am Mammografiescreening teilnehmen, sterben nach Gigerenzers Angaben vier an Brustkrebs, gegenüber fünf Frauen, die nicht zum Screening gehen.

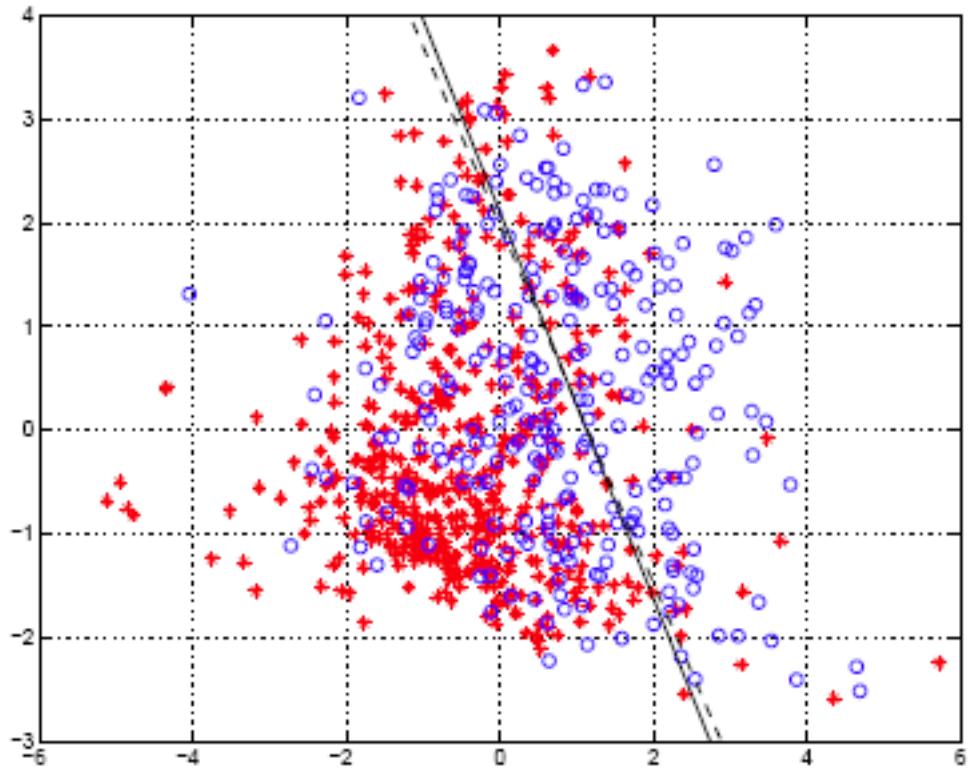
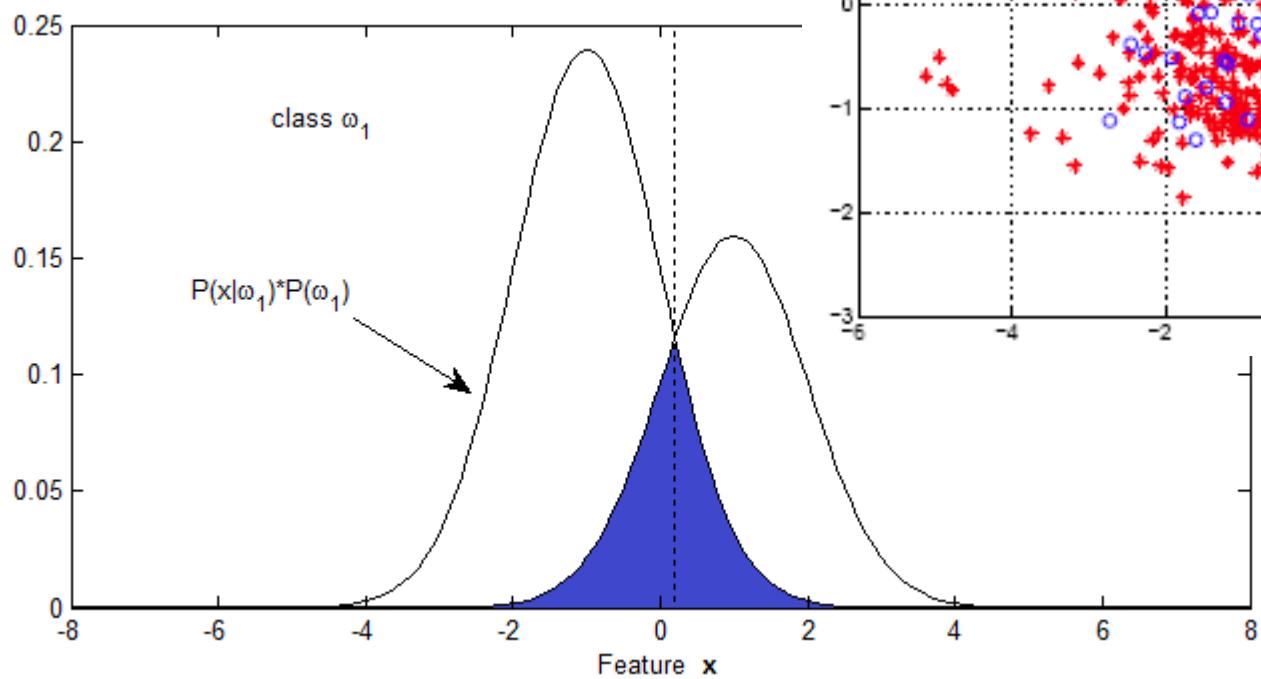
Dieser Unterschied werde dann für Aussagen genutzt, wonach ein Screening die Brustkrebsmortalität um 20 Prozent senkt. Damit würden die Frauen in die Irre geführt, da sich im Einzelfall das Risiko an Brustkrebs zu sterben durch eine Nicht-Teilnahme kaum erhöhe, erklärte Gigerenzer.

Außerdem müsse berücksichtigt werden, dass Brustkrebsscreenings zu Fehlalarmen und überflüssigen Eingriffen führen.

In der Bevölkerung und auch in der Ärzteschaft werde der Nutzen der Mammografie als ein Mittel zur Vermeidung von tödlich verlaufenden Krebserkrankungen in hohem Maße überschätzt, erklärte er. Statt über relative Risiken zu informieren, sollten absolute Zahlen genannt werden.

Dann würde auch deutlich, dass Screeninguntersuchungen zur Früherkennung "so gut wie nichts" bringen. (sto)

# Classification Errors Will Happen



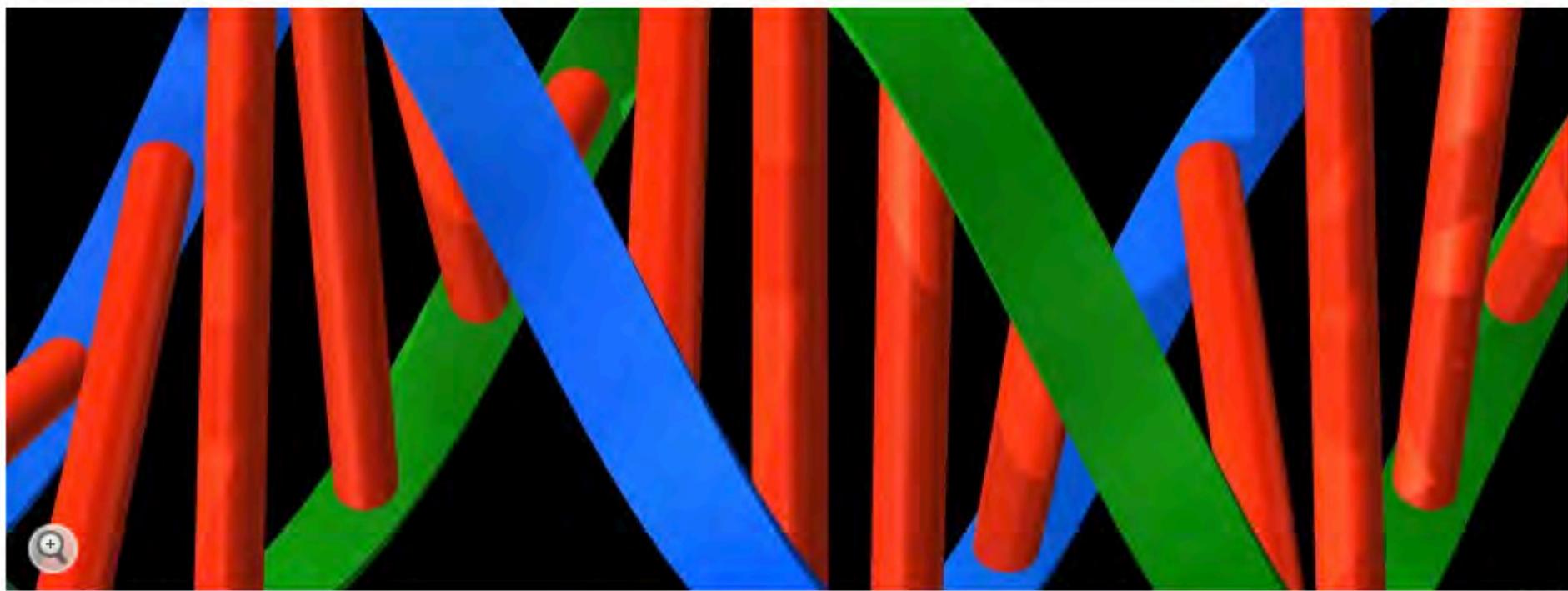
Pseudo-objectivity is a serious problem



welcome  
to you®



## **23andMe: US-Gesundheitsbehörde will Verkauf von Gentests stoppen**



Corbis

DNA-Doppelhelix: US-Gentest-Firma analysiert das Erbgut von Kunden auf erblich bedingte Erkrankungen

**Der Gentest-Firma 23andMe droht das Aus eines ihrer wichtigsten Geschäftsmodelle: Sie soll keine DNA-Tests mehr verkaufen. Dazu forderte die US-Gesundheitsbehörde FDA das Unternehmen auf. Die Begründung: Nutzen und Sicherheit seien bisher nicht belegt.**

Riesige Genom-Studie deckt auf

# Kerngesund trotz Gendefekten: Forscher stehen vor Rätsel um 13 Resistente

Donnerstag, 14.04.2016, 23:58

Teilen

0



G+1



★★★★★

0

Fehler melden

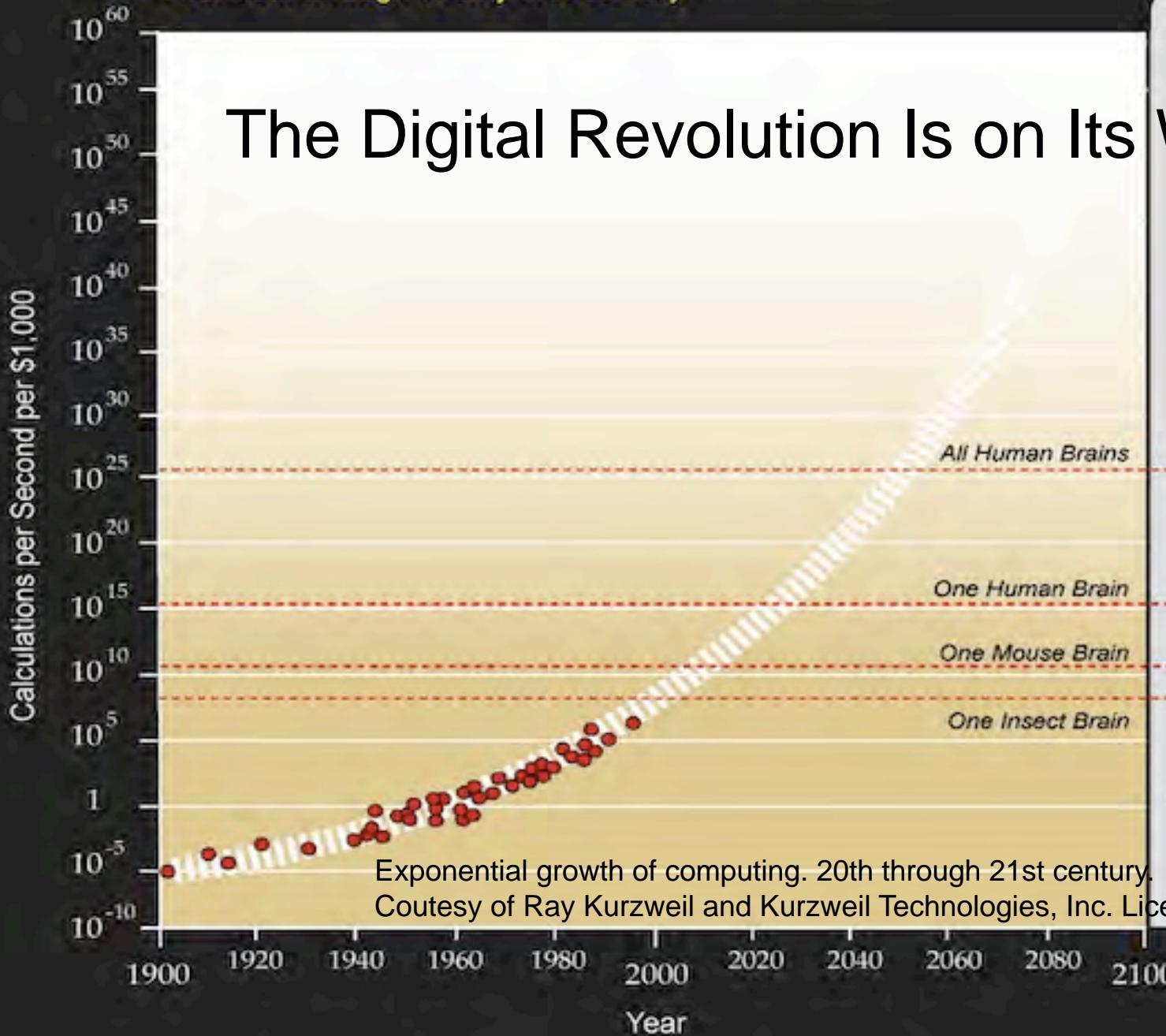


Will AI fix it?

# Exponential Growth of Computing

Twentieth through twenty first century

## The Digital Revolution Is on Its Way



Logarithmic Plot



# Better Chess Players



# Better in Answering Questions?



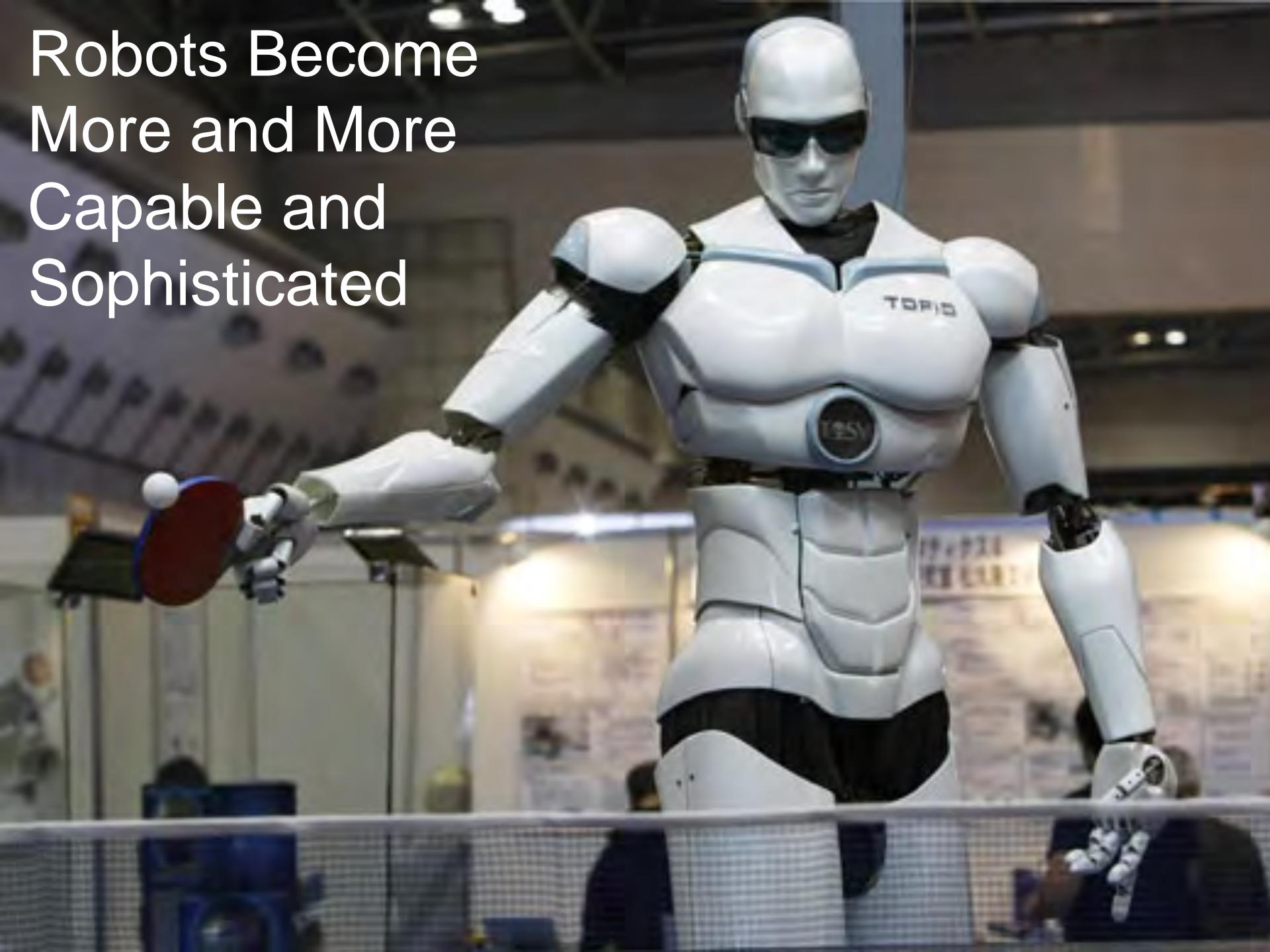


# Google DeepMind Challenge Match

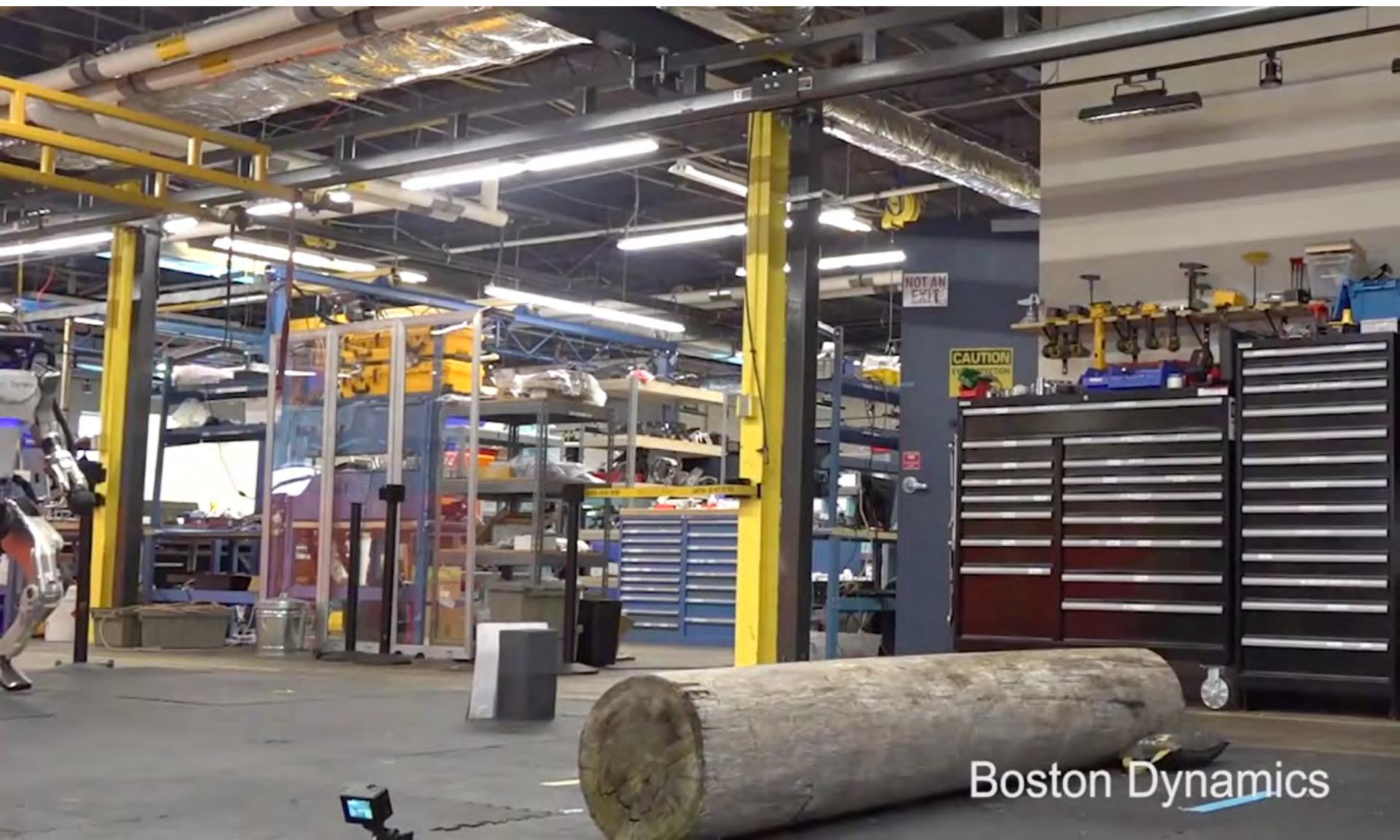
8 - 15 March 2016



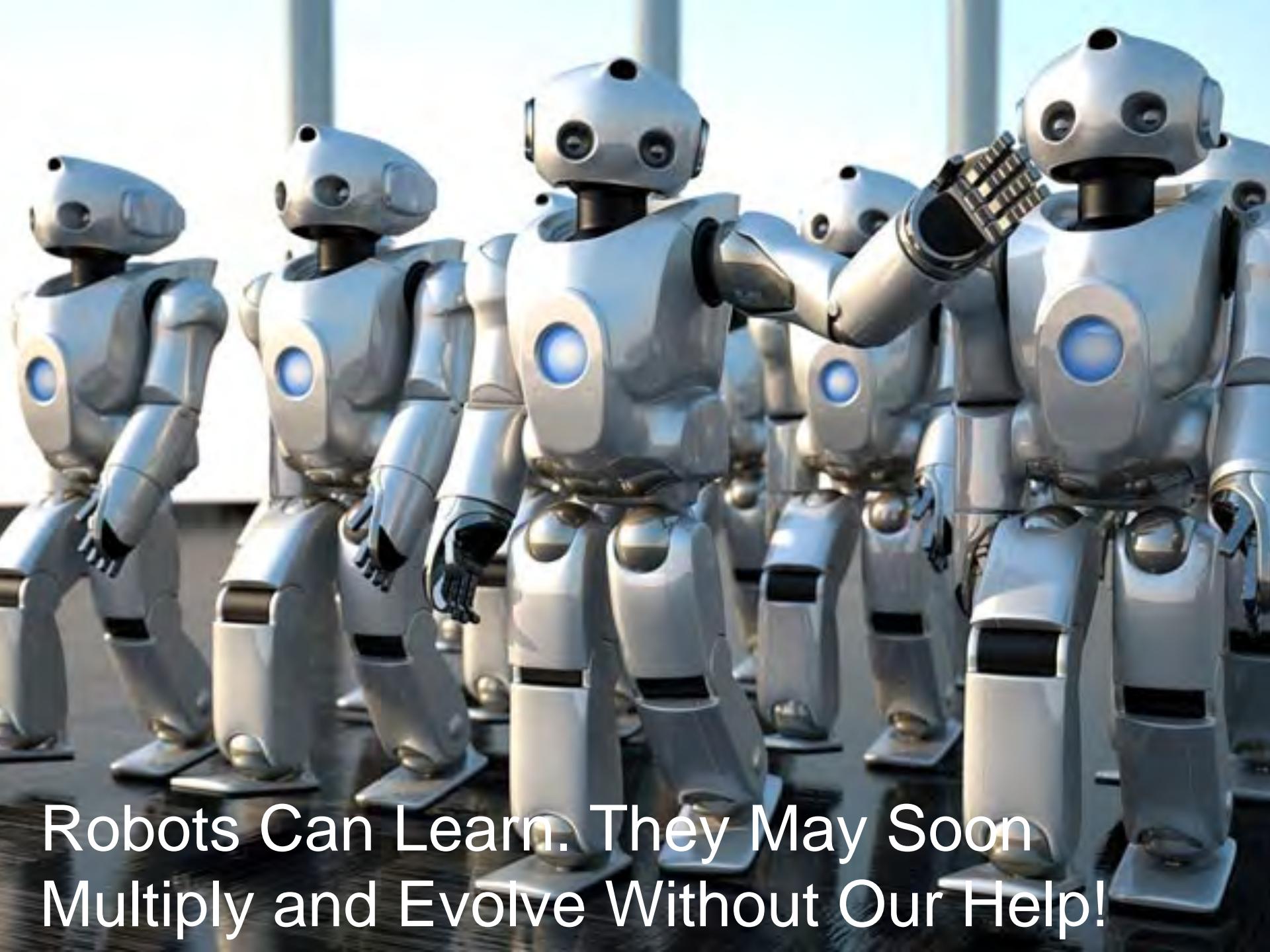
# Robots Become More and More Capable and Sophisticated



# The Official Status of Robotics



Boston Dynamics



Robots Can Learn. They May Soon  
Multiply and Evolve Without Our Help!

Intelligent Machines will  
be our tools,

Intelligent Machines will  
be our tools,  
then our “partners”,

Intelligent Machines will  
be our tools,  
then our “partners”,  
then our coaches,

Intelligent Machines will  
be our tools,  
then our “partners”,  
then our coaches,  
then our bosses...?

Intelligent Machines will  
be our tools,  
then our “partners”,  
then our coaches,  
then our bosses...

Soon, we may need  
“upgrades” to be  
competitive

# Elon Musk wants to link computers to our brains to prevent an existential threat to humanity



Kevin Loria [✉](#) [RSS](#) [Twitter](#)

⌚ Jun. 17, 2017, 12:35 PM [🔥 26,903](#)



[FACEBOOK](#)



[LINKEDIN](#)



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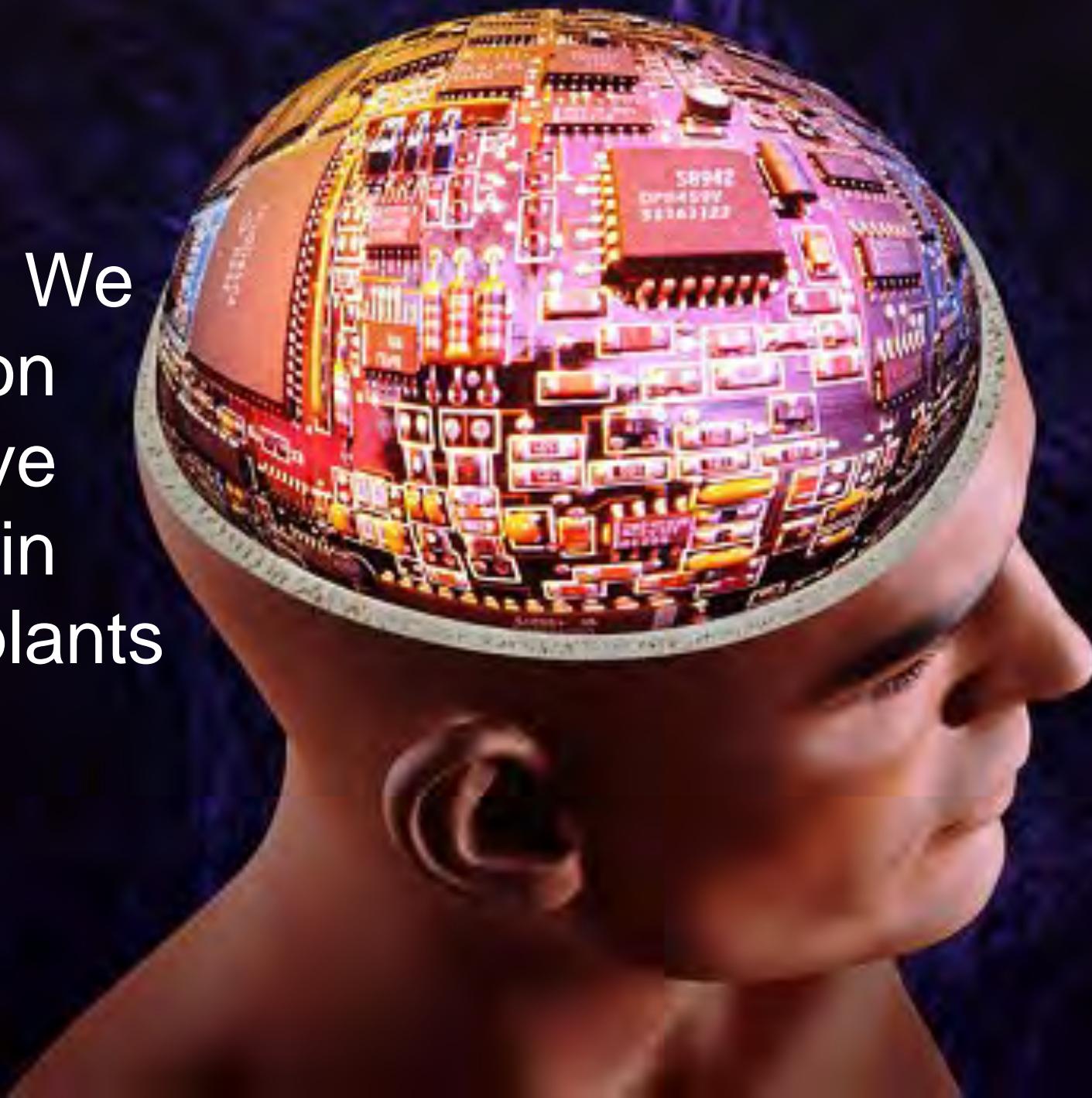


Elon Musk is a busy guy.

He's developing [electric vehicles](#), [self-driving cars](#), [tunnel-boring infrastructure](#) [technology](#), and [re-usable rockets](#) (with the goal of getting humans to Mars).



Will We  
Soon  
Have  
Brain  
Implants  
?



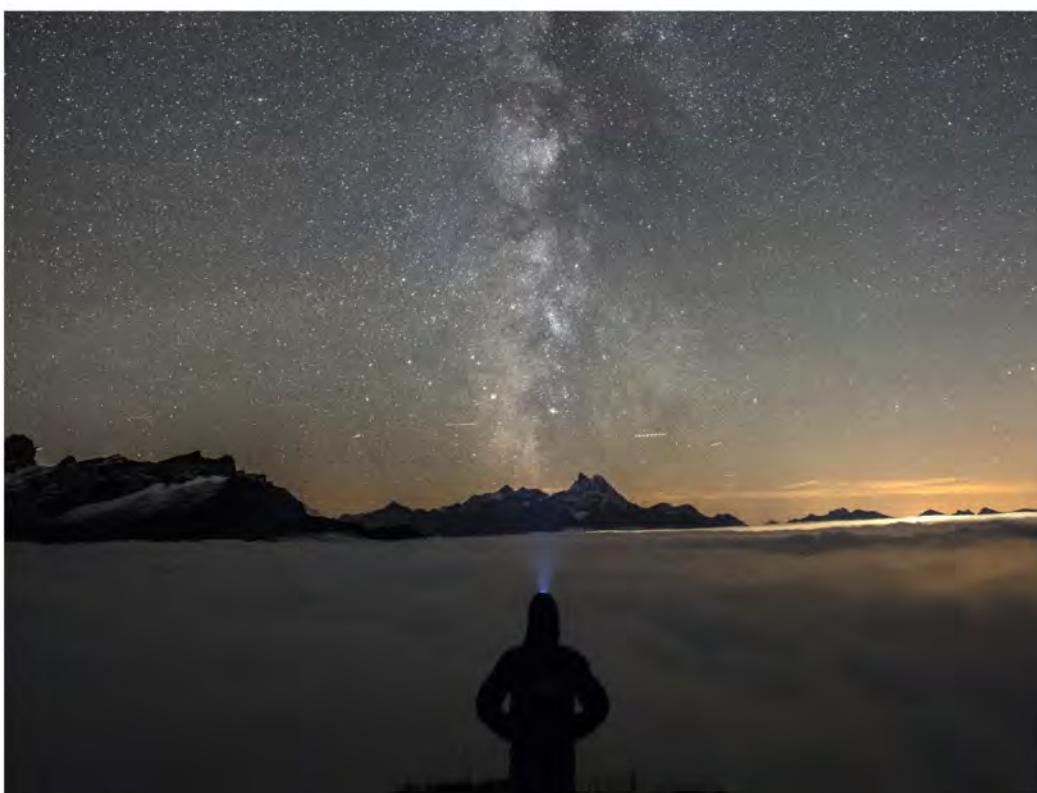
# Unsere Nachfahren werden Maschinen sein

Der Händedruck zwischen Mensch und E. T. findet wohl niemals statt. Die Zukunft gehört anorganischen Lebensformen.

---

Martin J. Rees

21.10.2017, 05:30 Uhr



In der Milchstrasse gibt es Milliarden Planeten, die der Erde ähneln. (Bild: Anthony Anex / Keystone)

# Jürgen Schmidhuber: «Die Geschichte wird nicht mehr von Menschen dominiert»





## Master's in Artificial Intelligence (Fall 2017)

Contact:

Jürgen Schmidhuber  
IDSIA, Galleria 2, 6928  
Manno-Lugano, Switzerland



Master's in Artificial Intelligence (Fall 2017)

Contact:

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Fax +41 58 666666 1  
Fon +41 58 666666 2  
Sec +41 58 666666 6

# The Dark Secret at the Heart of AI

No one really knows how the most advanced algorithms do what they do. That could be a problem.

by Will Knight April 11, 2017

L

ast year, a strange self-driving car was released onto the quiet roads of Monmouth County, New Jersey. The experimental



Supercomputer in der Medizin

## Dr. Watson versagt

**SPIEGEL+** Exklusiv für Abonnenten

**IBM will mit Großrechnern Krankheiten behandeln, bisher mit wenig Erfolg.** Von Martin U. Müller

# Think twice before consulting Dr. Google, researchers say



When you seek health advice online, you may unwittingly be sharing sensitive information with third parties



Kelly Crowe · CBC News · Posted: Apr 07, 2018 9:00 AM ET | Last Updated: April 7



# Forget Killer Robots— Bias Is the Real AI Danger

John Giannandrea, who leads AI at Google, is worried about intelligent systems learning human prejudices.

by Will Knight    October 3, 2017



Carnegie Mellon University, Google, Algorithm, Google Algorithm, National Science Foundation, AdFisher

## Study Suggests That Google Algorithms Discriminate Against Women

9 July 2015, 3:34 pm EDT By [J.E. Reich](#) Tech Times

The results of a study conducted at Carnegie Mellon University propose that Google algorithms tend to discriminate against female job-seekers. (Robert Scoble | Flickr)

Using [AdFisher](#), a tool developed at CMU that uses statistical methodology to analyze Google ads, researchers created 17,370 simulated male and female user profiles programmed only to visit jobseeker websites. The experiment was meant to be part of a larger study concerning general Google Ad settings.

However, the CMU researchers discovered that 1,000 profiles out of the 17,370 specifically configured to peruse available salaried positions, more results popped up for the male profiles that featured career coaching services for executive positions that paid \$200k or more than they did for the female-oriented profiles.

What did the ladies get instead? Run-of-the mill posting services (and strangely enough, an auto dealer).

"The male users were shown the high-paying job ads about 1,800 times, compared to female users who saw those ads about 300 times," explained Ph.D. student Amit Datta in a [press release](#) issued by the university.

In the same statement, associate professor of electrical and computer engineering/computer science Anupam Datta confessed that the mainspring for the algorithmic male preference is more difficult to trace than one might imagine, but that programs like AdFisher might be able to correct them.



Bernard Parker, left, was rated high risk; Dylan Fugett was rated low risk. (Josh Ritchie for ProPublica)

# Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

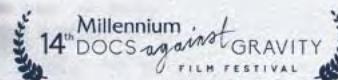
by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica

May 23, 2016

# Algorithms May Turn Correlations into Causal Relationships

WE KNOW YOU WILL  
COMMIT A CRIME.

YOU JUST DON'T  
KNOW IT YET.



# PRE-CRIME

a film by MONIKA HIELSCHER & MATTHIAS HEEDER

Kloos & Co.  
Medien GmbH

WDR® arte

Filmförderung Hamburg  
Schleswig-Holstein

FFA

Deutscher  
FILMFÖRDERFONDS

nddr  
Mitteldeutsche  
Medienförderung

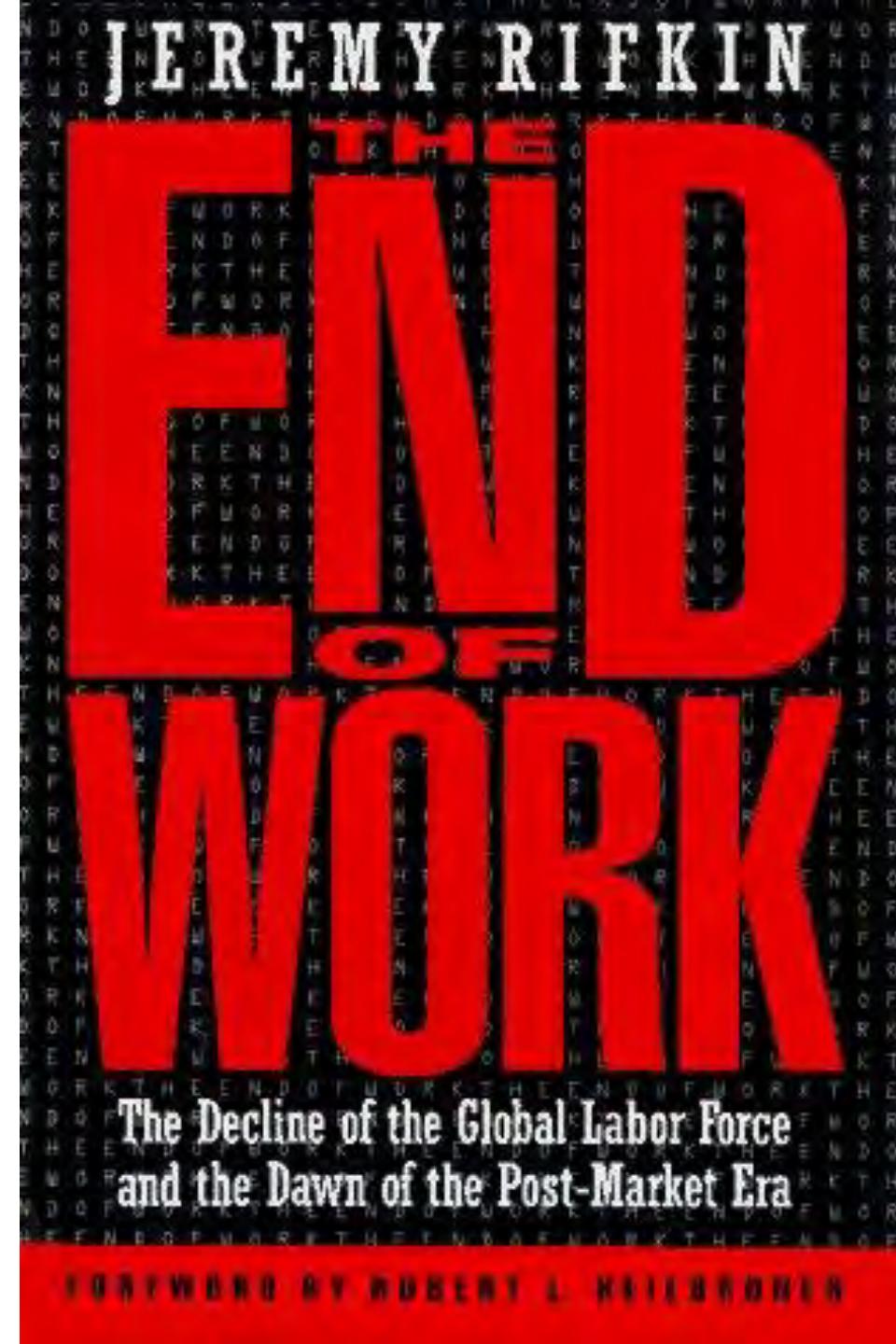
MEDIA  
EUROPE LOVES CINEMA

german  
films

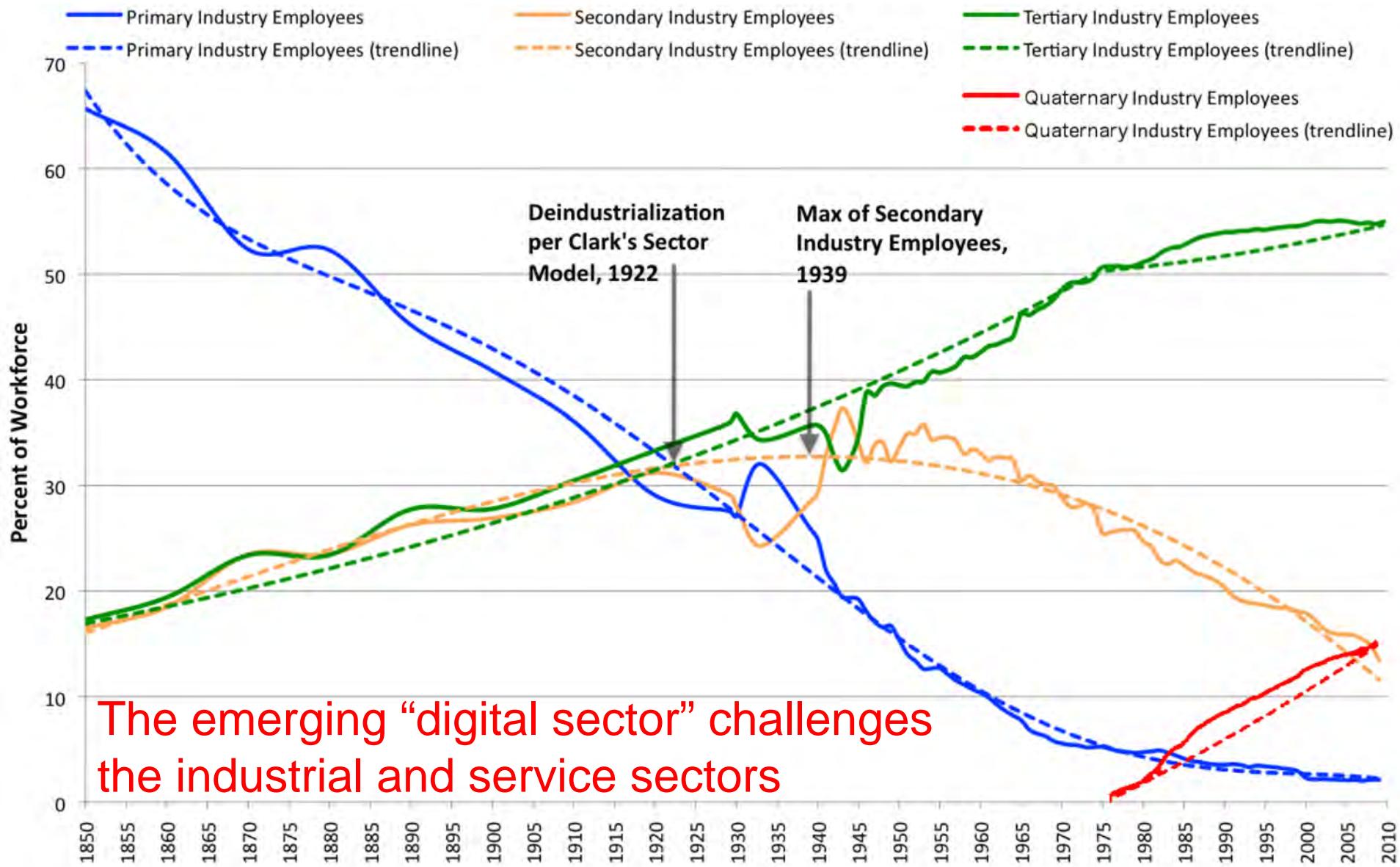
RISE AND SHINE  
WORLD SALES



# THE PERFECT STORM



# The Economy 4.0 Is Born



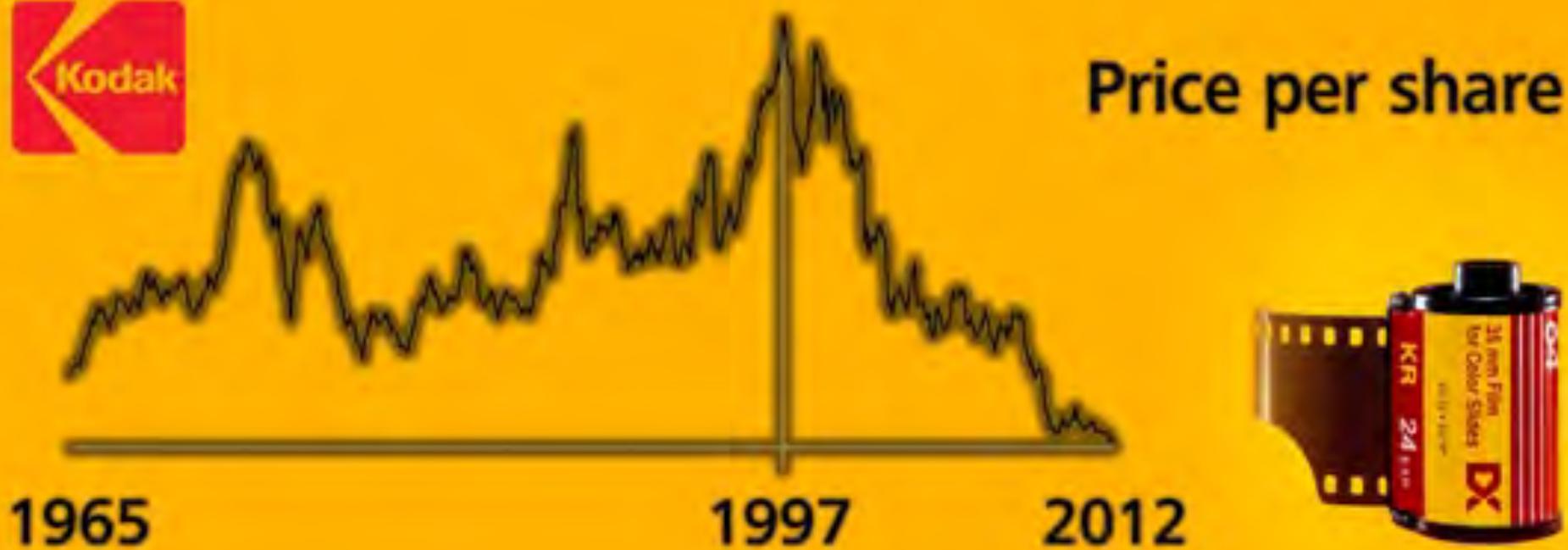
# A Massive Loss of Jobs Is Already Happening

## European Youth Unemployment Skyrockets



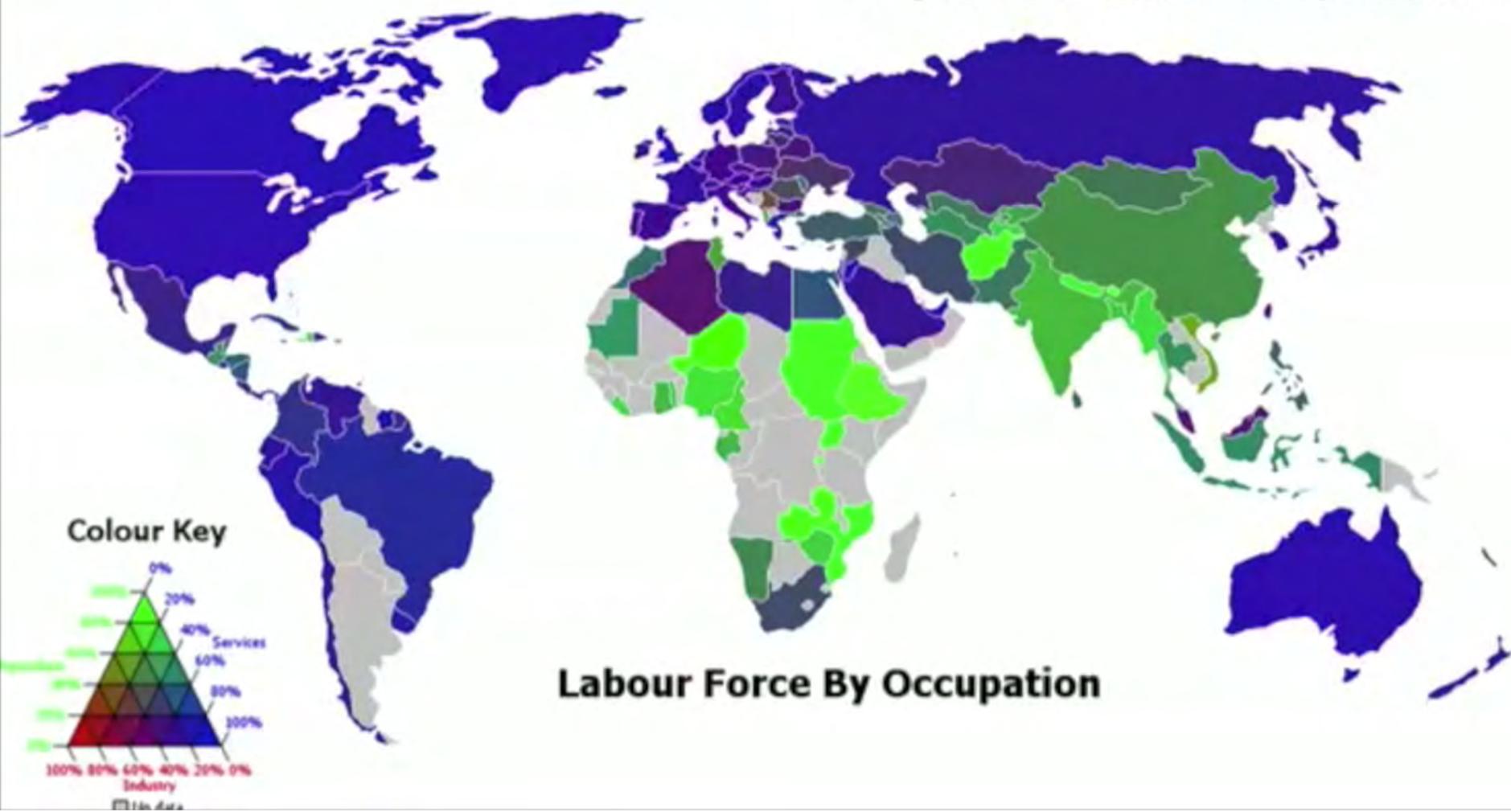
Source: Thomson Reuters Datastream, Eurostat  
Reuters graphic/Scott Barber 4/2/2012

40% of  
Today's  
Top 500  
Companies  
Will Be Gone  
in 10 Years



# Jeremy Howard on Learning Computers

*GDP Composition By Sector and Labour Force By Occupation, produced using data from the CIA World Factbook 2006 (Wikimedia Commons)*



# Steve Wozniak on Artificial Intelligence

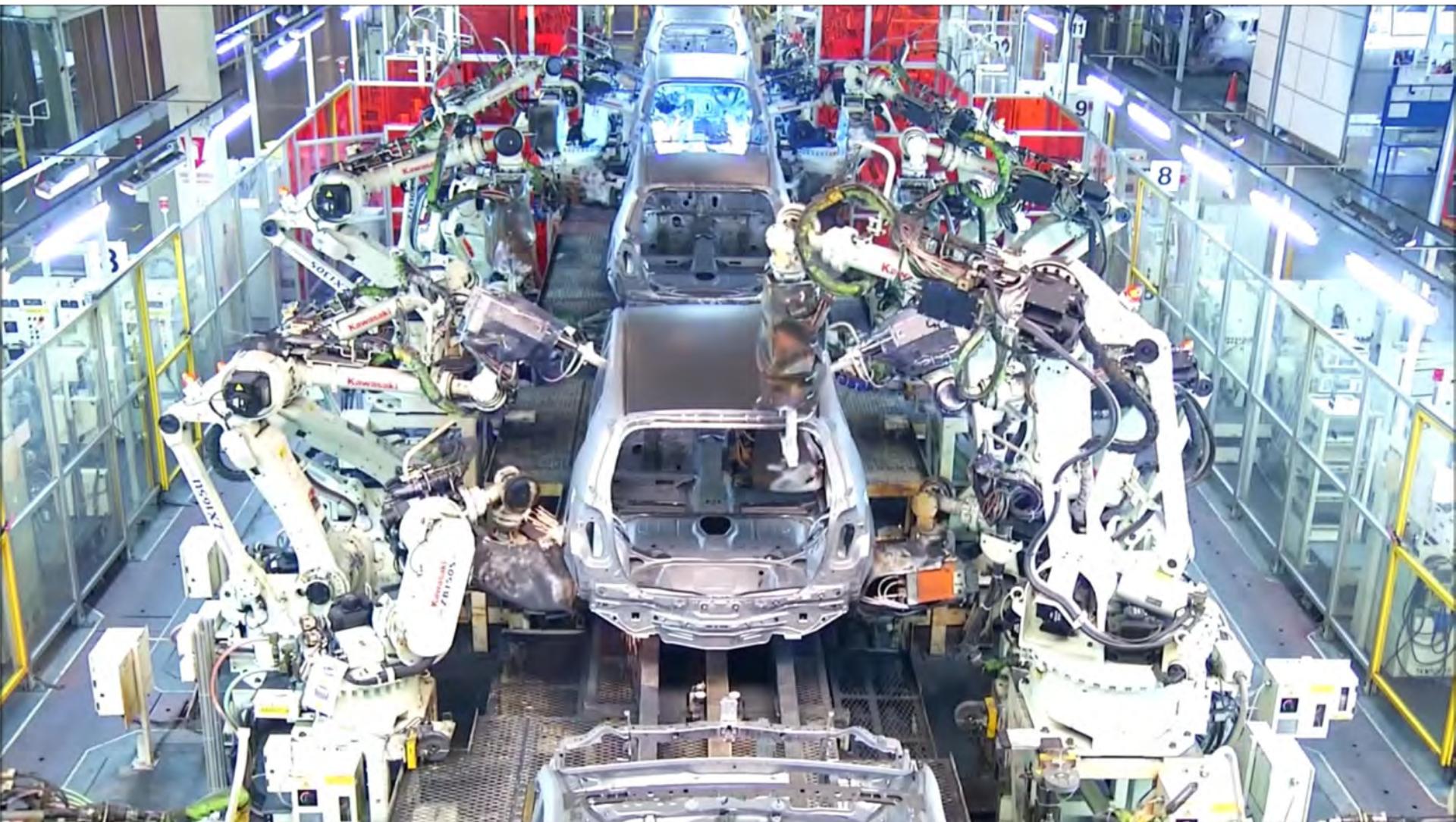
"Computers are going to take over from humans, no question ...

Like people including Stephen Hawking and Elon Musk have predicted, I agree that the future is scary and very bad for people ...

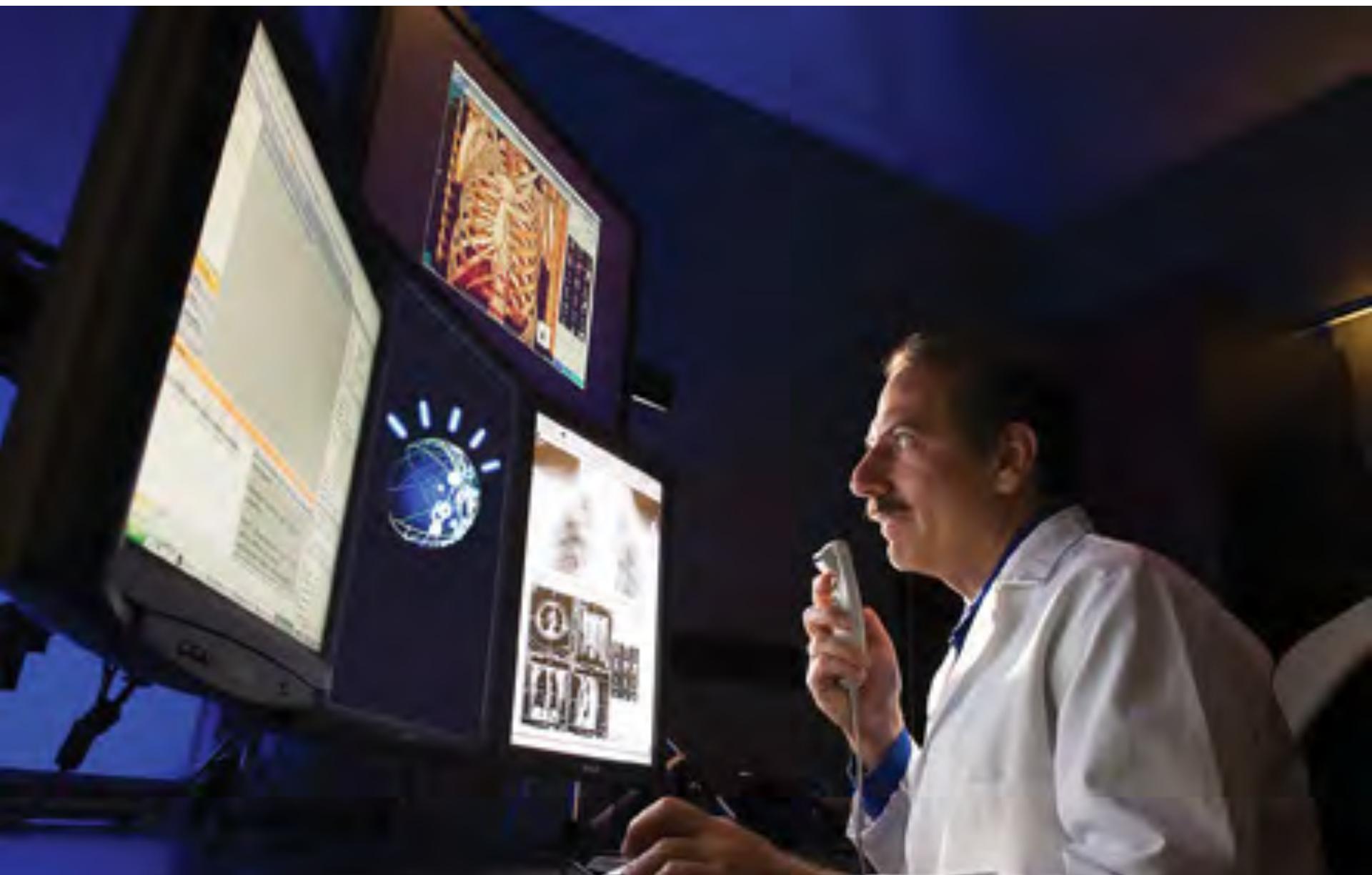
If we build these devices to take care of everything for us, eventually they'll think faster than us and they'll get rid of the slow humans to run companies more efficiently ...

Will we be the gods? Will we be the family pets? Or will we be ants that get stepped on? I don't know ..."

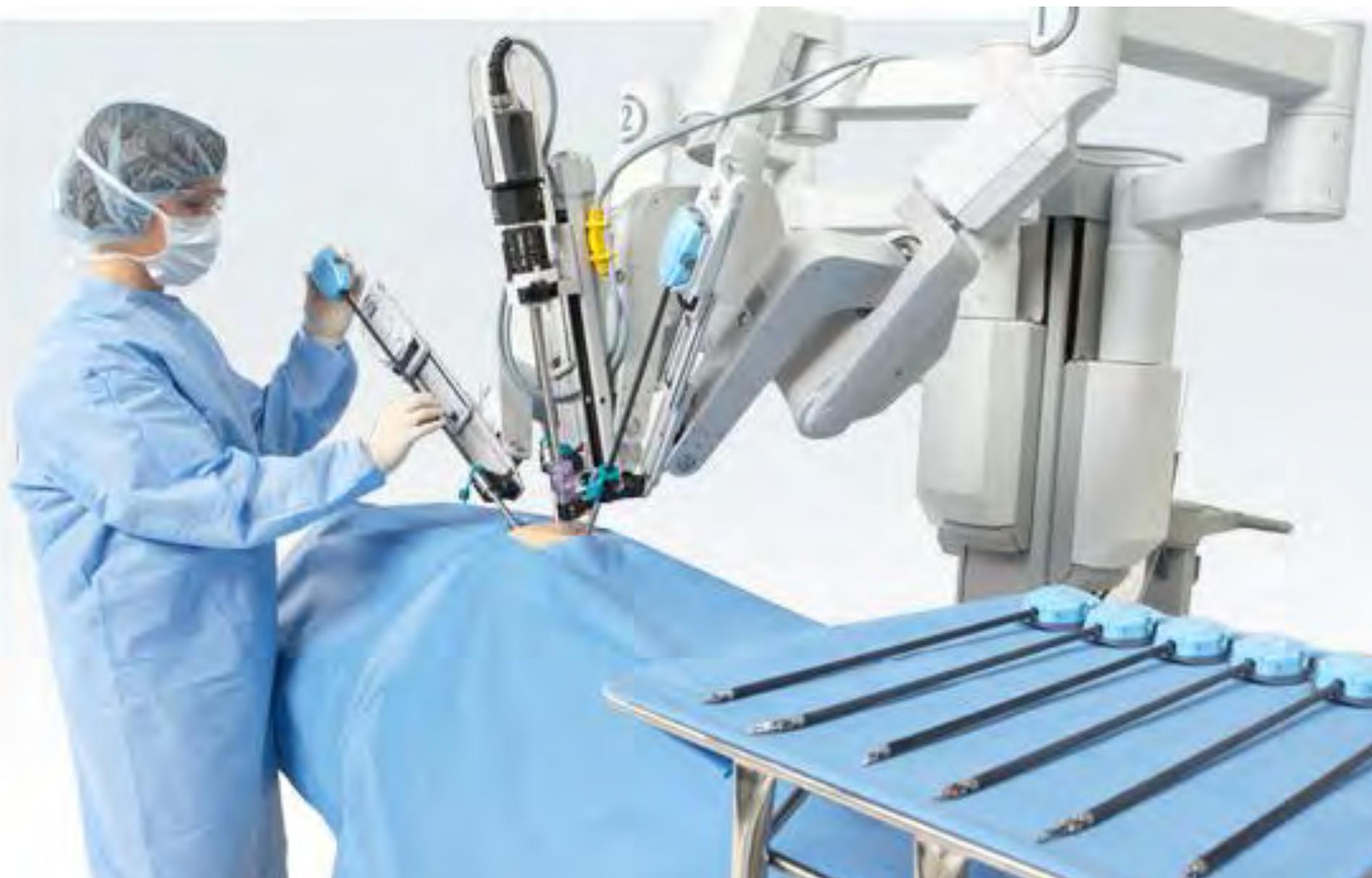
# Better Workers



# Better Doctors?



# Da Vinci Surgical System



# The robot lawyers are here - and they're winning



Rory Cellan-Jones

Technology correspondent

@BBCRoryCJ

⌚ 1 November 2017



Share



GETTY IMAGES

# Would you take orders from a ROBOT? An artificial intelligence becomes the world's first company director

- Robot was appointed by Hong-Kong venture capital firm Deep Knowledge
- The robot, named Vital, finds trends 'not immediately obvious to humans'
- Eventually, it will get an equal vote on financial decisions made by the firm

By [ELLIE ZOLFAGHARIFARD](#) 

PUBLISHED: 17:34 GMT, 19 May 2014 | UPDATED: 22:50 GMT, 19 May 2014



 26  
View comments

Robots have been creeping into our homes, streets and cities – and soon they could be dominating our boardrooms.

In a world first, Japanese venture capital firm Deep Knowledge recently named an artificial intelligence (AI) to its board of directors.

The robot, named Vital, was chosen for its ability to pick up on market trends 'not immediately obvious to humans'.

# Roboter als Assistenz-Professoren?

Roboter werden immer schlauer und bedrohen so viele Jobs. Campus Magazin fragt: Können Roboter bald auch Professoren ersetzen? Als Assistenten für die Lehre werden sie seit Kurzem an der Uni Marburg getestet.

Von: Fabian Mader

Stand: 03.05.2017 | [Bildnachweis](#)



Digital Intelligence: Roboter als Assistenz-Professoren?

# Der vollautomatische Politiker

Ein Roboter könnte 2020 für das Amt des neuseeländischen Premierministers kandidieren. Er vergisst nichts, hat aber auch keinen persönlichen Stil. VON BARBARA BARKHAUSEN



Stecker statt Synapsen, Kabel anstelle des Kleinhirns - Künstliche Intelligenz macht auch vor Politikern nicht halt. FOTO: FABRICE COFFRINI/AFP

# Yesterday's Jobs

Arbeiten Sie als Headhunte r / Uni-Professor /  
Textilarbeiter / Krankenpfleger / Partnervermittler /  
Illustrator / Finanzanalyst / News-Journalist /  
Uni-Assistent / Künstler / Callcenter-Mitarbeiter /  
Busfahrer / Vermögensverwalter / Laborant /  
Unternehmensberater / Videoverleiher / Supermarktkassierer / Altenpfleger / Druckereiangestellter /  
Nachhilfelehrer / Fotograf / Buchhändler / Soldat /  
Reiseverkehrskaufmann / Banker / Verkäufer?

Dann werden Sie es in Zukunft noch schwerer haben.

# WILL WORK FOR FREE



# WE MUST REMAKE SOCIETY IN THE COMING AGE OF AI: OBAMA

THE FRONTIERS ISSUE

## HOW ARTIFICIAL INTELLIGENCE WILL AFFECT JOBS

WIRED

We are at the beginning of a new age



Universe – C. Flammarion, Woodcut, Paris 1888, Colorit : Heikenwaelder Hugo, Vienna 1998, CC BY-SA 2.5

Global Agenda

Information Technology

Information and Entertainment

Emerging Technologies

# How can we engineer a more responsible digital future



Creating ethical machines is essential in order to prevent technology undermining basic human values.

Image: REUTERS/Thomas Peter

# Design for Values

- Cooperation
- Fairness
- Trust
- Truth
- ...

# Value Pluralism and Design for Values

- Privacy
- Autonomy
- Equity
- Justice
- Dignity
- Happiness
- Wellbeing
- Safety
- Security
- Sustainability
- Health
- Friendship
- Solidarity
- Peace
- Usability
- Resilience
- Efficiency
- Flexibility

After Jeroen van den Hoven

Goals must be balanced (politically negotiated).  
Otherwise, the approach is oversimplified, inadequate.

# What Does Democracy Mean?

- Human rights, human dignity
- Freedom
- Self-determination
- Pluralism
- Protection of minorities
- Division of power
- Checks and Balances
- Participation
- Transparency
- Fairness
- Justice
- Legitimacy
- Anonymous, equal votes

Design for values,  
value-sensitive design,  
ethically aligned design

- Privacy
- ✓ Protection from misuse/exposure
- ✓ Right to be left alone

# **Grundgesetz für die Bundesrepublik Deutschland**

## **Art 1**

- (1) Die Würde des Menschen ist unantastbar. Sie zu achten und zu schützen ist Verpflichtung aller staatlichen Gewalt.
- (2) Das Deutsche Volk bekennt sich darum zu unverletzlichen und unveräußerlichen Menschenrechten als Grundlage jeder menschlichen Gemeinschaft, des Friedens und der Gerechtigkeit in der Welt.
- (3) Die nachfolgenden Grundrechte binden Gesetzgebung, vollziehende Gewalt und Rechtsprechung als unmittelbar geltendes Recht.

Als Wesensmerkmal ist Menschenwürde unveräußerlich [also auch durch Terms of Use].

Menschenwürde (Art. 1 GG) hat Ewigkeitsgarantie und muss vom Staat auch gegenüber Dritten (inkl. Unternehmen und anderen Staaten) durchgesetzt werden. Das ist seine Legitimationsgrundlage.

# Informational Self-Determination

1. Send (a copy of) all personal data to a personal data mailbox
2. Require legally that personal data can only be used with the informed consent of individuals
3. Create a public platform that allows individuals to determine who is allowed to use what kind of data for what period of time and purpose (and what amount of money)
4. Build AI-based digital assistants that help people to easily administer personal data according to their preferences
5. Allow governments and scientists to run statistics on data
6. Report data use transparently to data mailbox

# Empowering People



[www.enableeurope.eu](http://www.enableeurope.eu)

If set up well, enabling users, customers, citizens will lead to better services, better products, better businesses, better neighborhoods, smarter cities, smarter societies ...

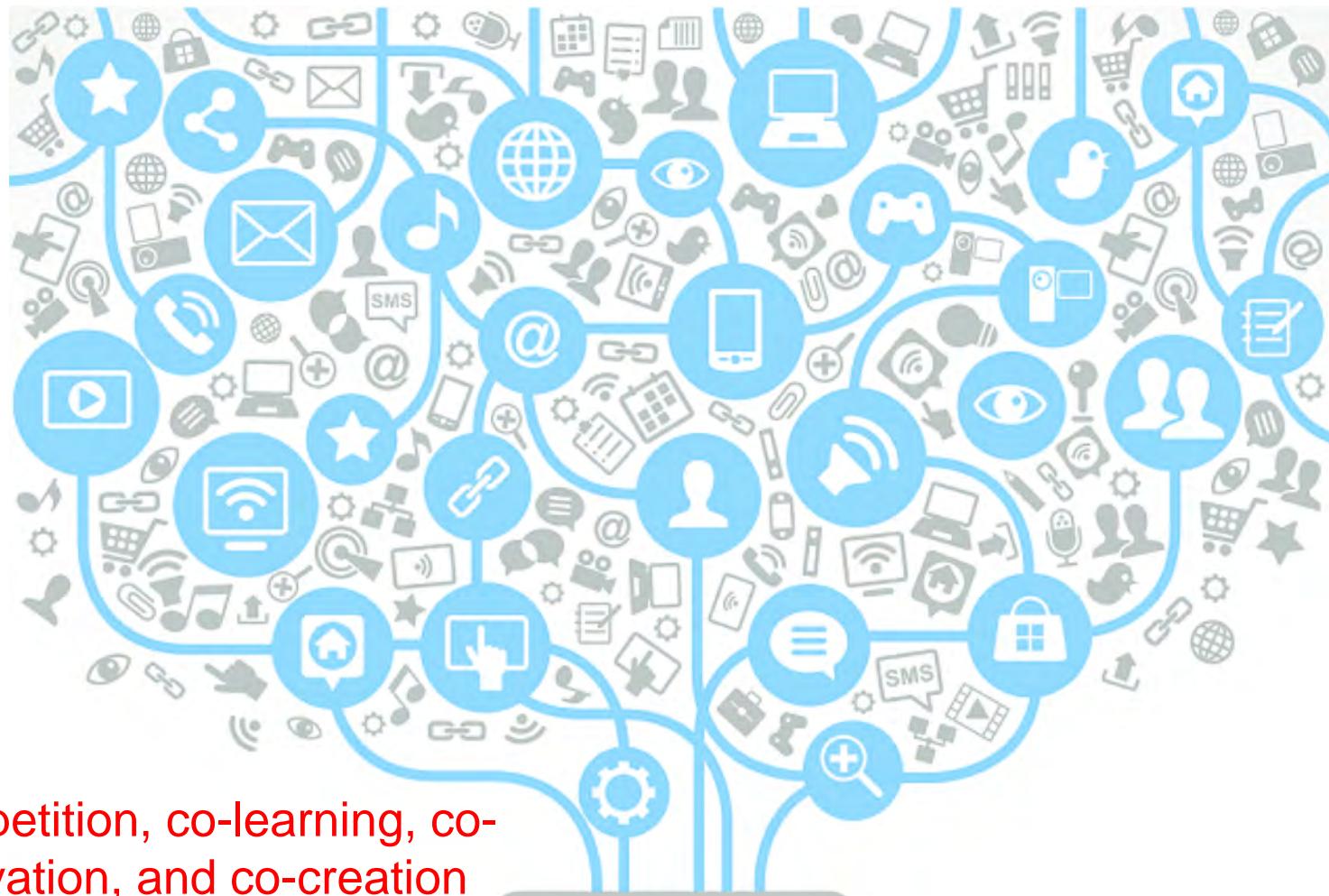


Nathan  
Sawaya



Combinatorial Innovation,  
Co-Evolution (needs Freedom)

# Information, Innovation, Production and Service Ecosystem



co-epetition, co-learning, co-innovation, and co-creation

Combinatorial innovation

 English ▾

6



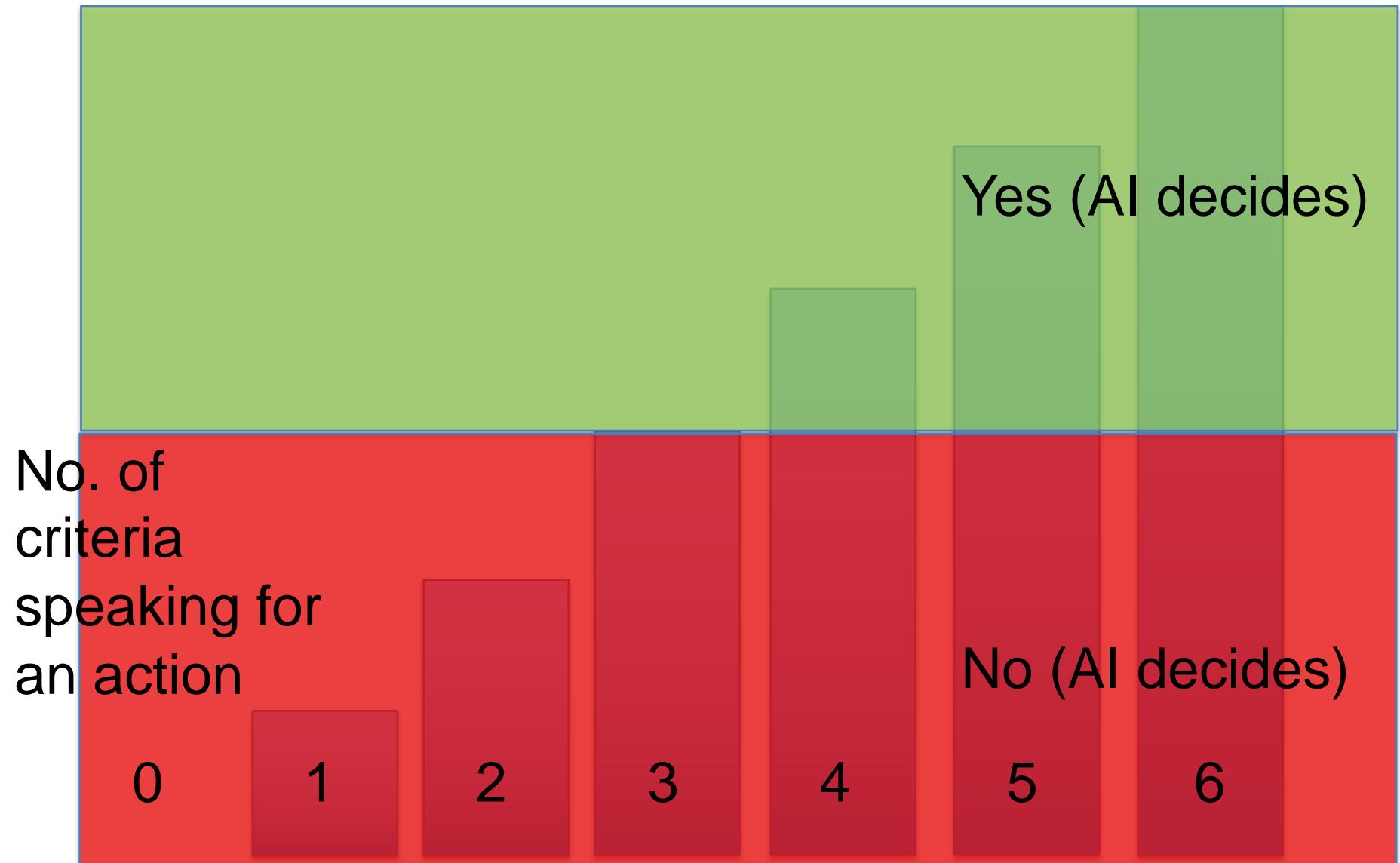
## The Hidden Danger of Big Data

Aug 16, 2016 | CARLO RATTI, DIRK HELBING

*With big data, we can multiply our options and filter out things we don't want to see. But there is much to be said for making discoveries through pure serendipity: contingency and randomness often furnish the transformational or counterintuitive ideas that propel humanity forward.*

# Artificial Intelligence Taking Over

Take action?



# Re-Inventing Freedom in the Digital Age

Take action?



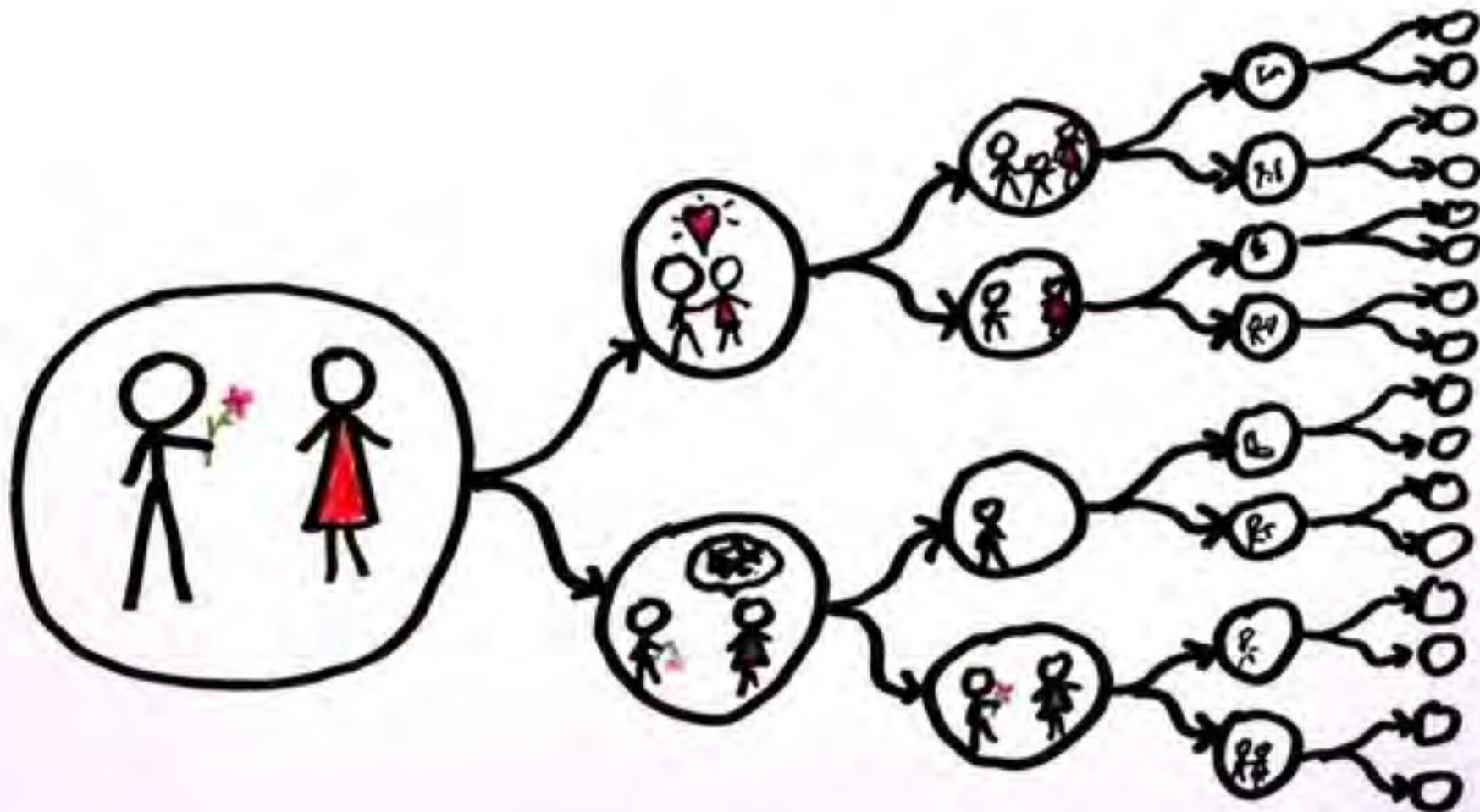
# Unser Wille ist doch nicht so unfrei

Seit dem berühmten Libet-Experiment glauben viele, statt des freien Willens würden unbewusste Hirnprozesse über uns gebieten. Ein ähnlicher Versuch widerspricht nun.

von [Daniela Zeibig](#)

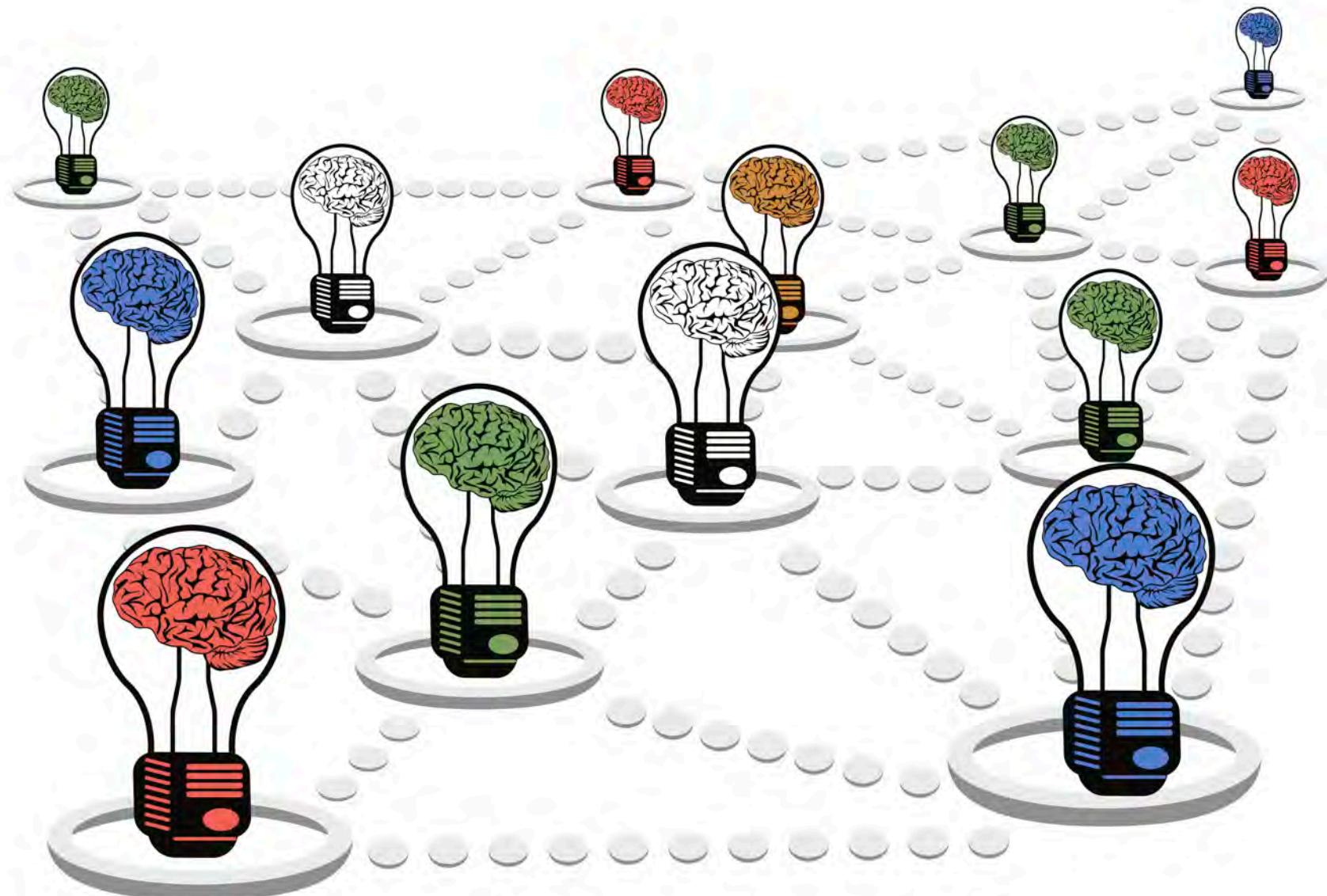


# Ask At Relevant Decision Points

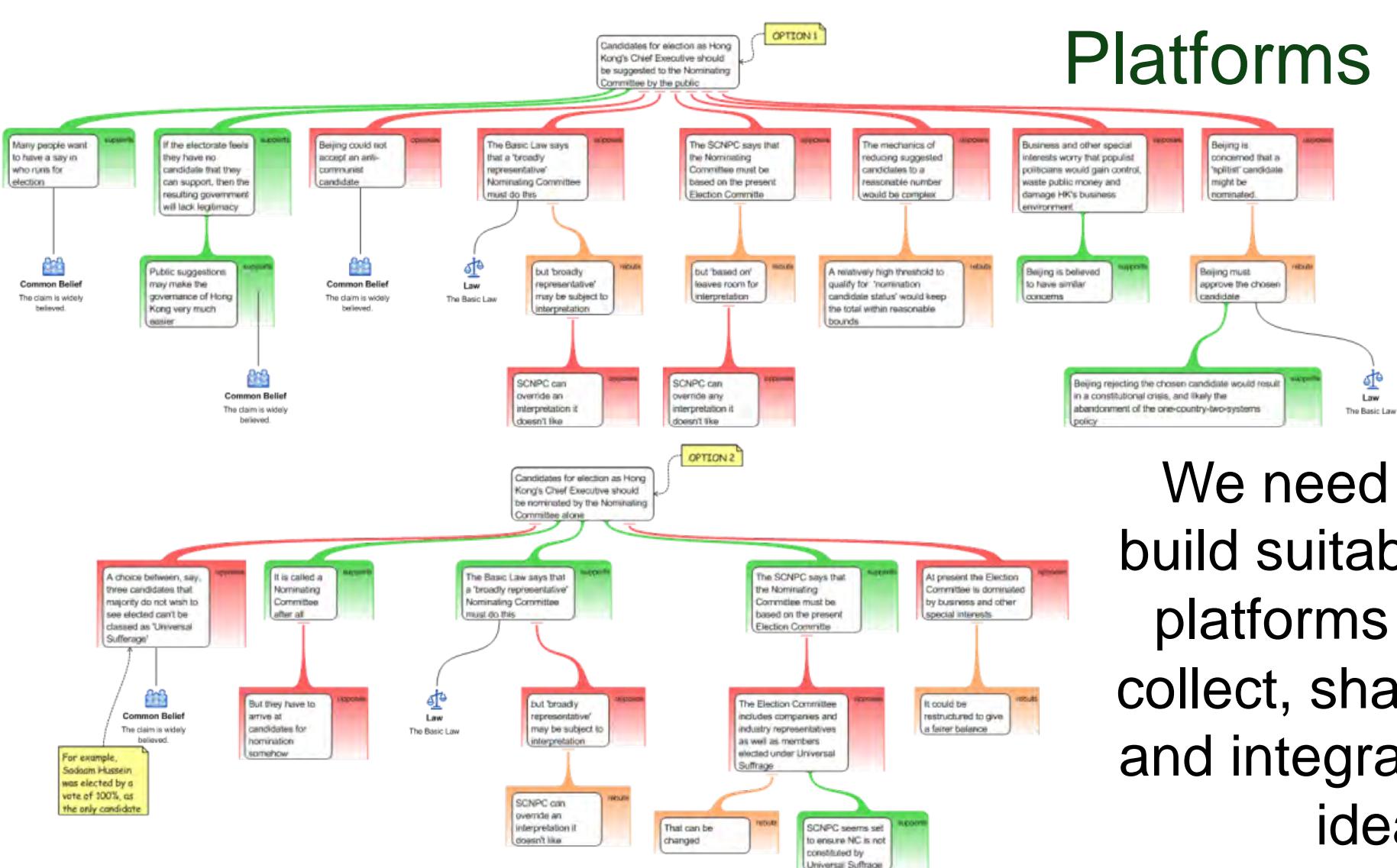


# Democracy 2.0: Boosting collective intelligence

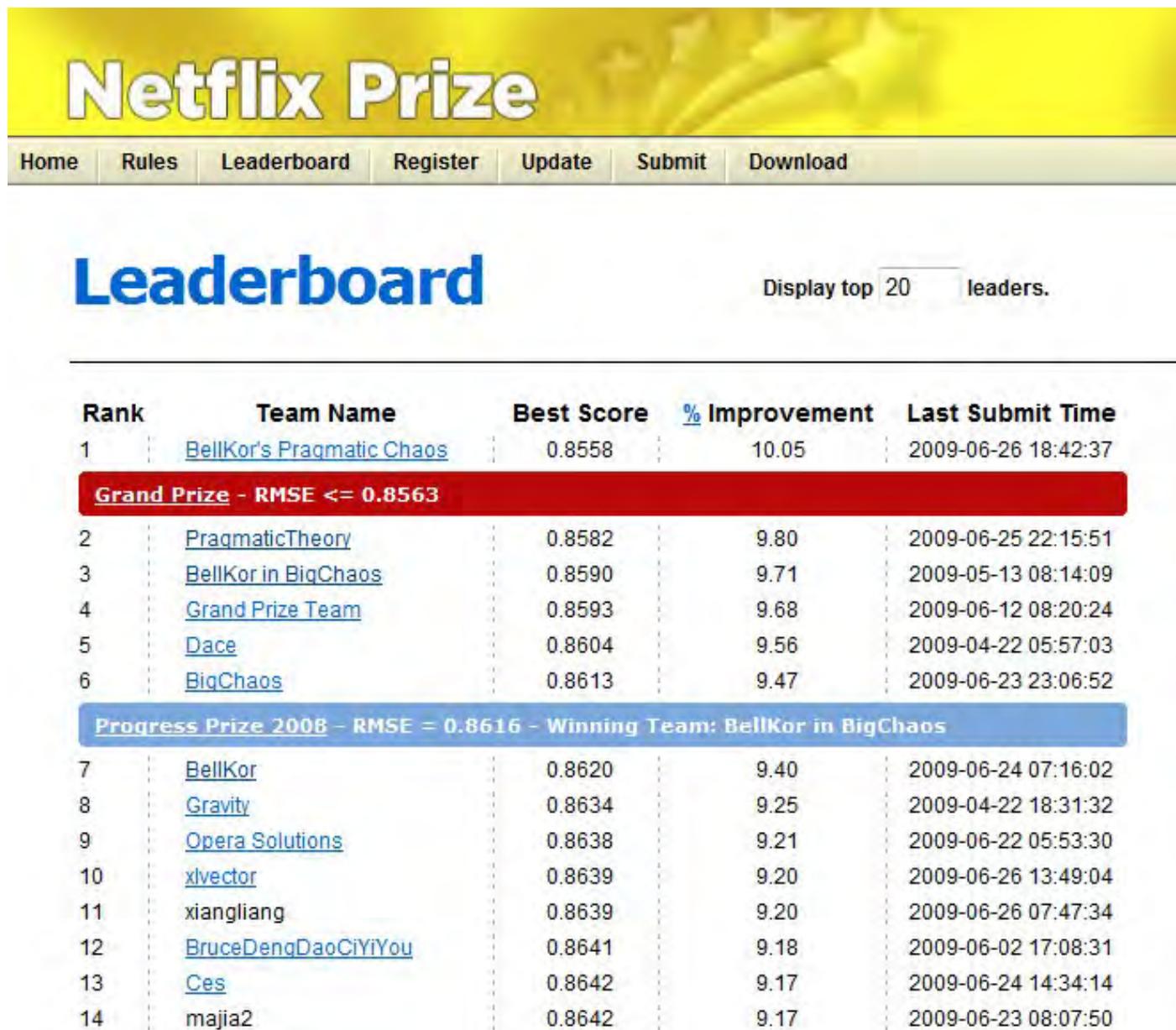
# Bring the Best Ideas of Many Minds Together



# Online Deliberation Platforms



# Diversity Wins, Not the Best



The screenshot shows the Netflix Prize Leaderboard page. The top navigation bar includes links for Home, Rules, Leaderboard, Register, Update, Submit, and Download. The main title is "Leaderboard" with a subtitle "Display top 20 leaders." A red box highlights the top team, "BellKor's Pragmatic Chaos", which has a Best Score of 0.8558 and an Improvement of 10.05. Below this, a red box highlights the "Grand Prize - RMSE <= 0.8563" category, listing the top 6 teams. Another red box highlights the "Progress Prize 2008 - RMSE = 0.8616 - Winning Team: BellKor in BigChaos" category, listing the top 14 teams.

Rank	Team Name	Best Score	% Improvement	Last Submit Time
1	<a href="#">BellKor's Pragmatic Chaos</a>	0.8558	10.05	2009-06-26 18:42:37
2	<a href="#">PragmaticTheory</a>	0.8582	9.80	2009-06-25 22:15:51
3	<a href="#">BellKor in BigChaos</a>	0.8590	9.71	2009-05-13 08:14:09
4	<a href="#">Grand Prize Team</a>	0.8593	9.68	2009-06-12 08:20:24
5	<a href="#">Dace</a>	0.8604	9.56	2009-04-22 05:57:03
6	<a href="#">BigChaos</a>	0.8613	9.47	2009-06-23 23:06:52
7	<a href="#">BellKor</a>	0.8620	9.40	2009-06-24 07:16:02
8	<a href="#">Gravity</a>	0.8634	9.25	2009-04-22 18:31:32
9	<a href="#">Opera Solutions</a>	0.8638	9.21	2009-06-22 05:53:30
10	<a href="#">xlvector</a>	0.8639	9.20	2009-06-26 13:49:04
11	xiangliang	0.8639	9.20	2009-06-26 07:47:34
12	<a href="#">BruceDengDaoCiYiYou</a>	0.8641	9.18	2009-06-02 17:08:31
13	<a href="#">Ces</a>	0.8642	9.17	2009-06-24 14:34:14
14	majia2	0.8642	9.17	2009-06-23 08:07:50

Top-down  
and majority  
decisions  
obstruct  
collective  
intelligence

Wisdom of  
crowds  
requires  
independent  
exploration  
and then  
integration

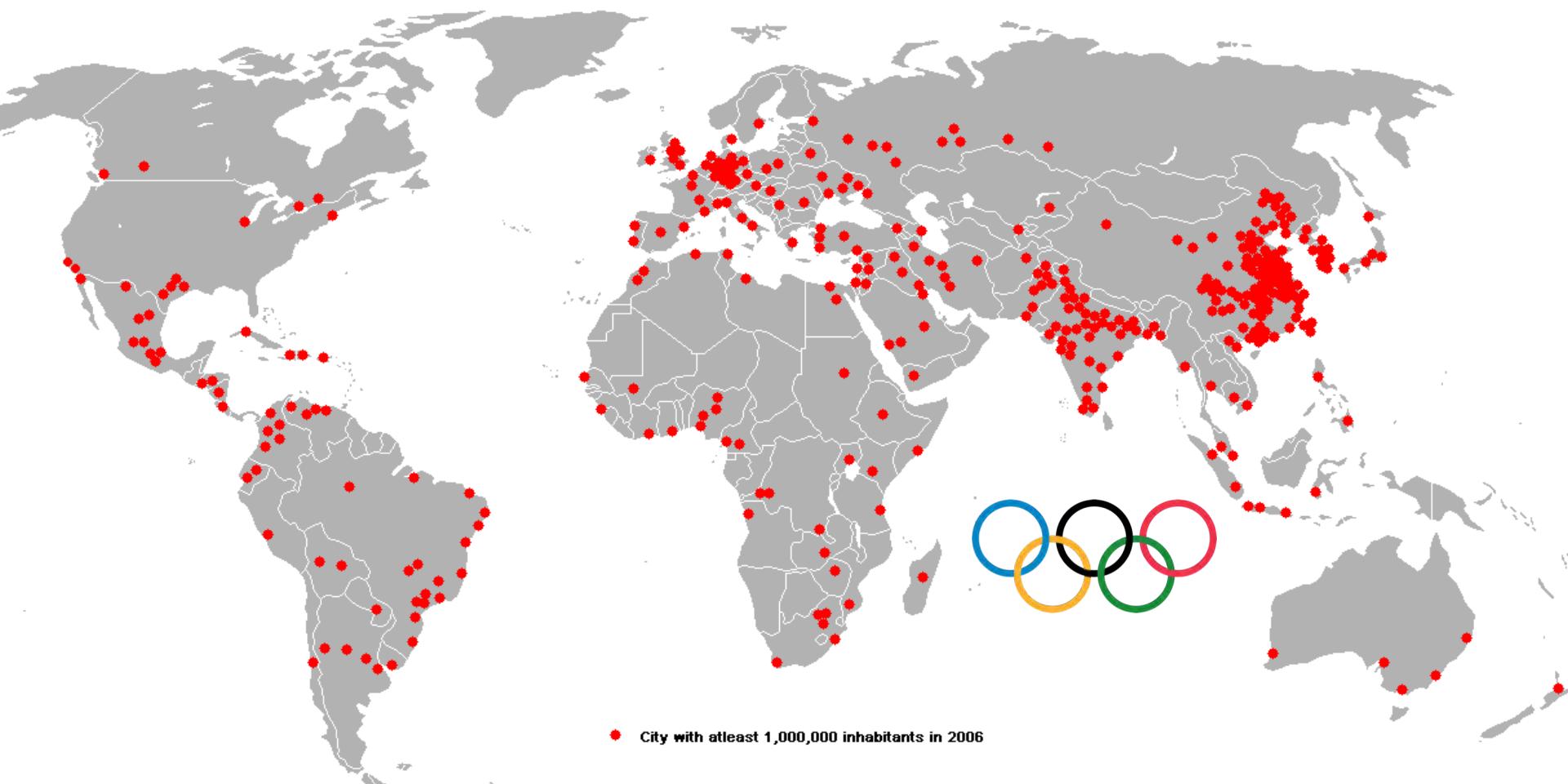


Many choices that people consider their own are already determined by algorithms.

# Build digital democracy

Open sharing of data that are collected with smart devices would empower citizens and create jobs, say **Dirk Helbing** and **Evangelos Pournaras**.

# Countering Global Problems Bottom-Up: City Olympics for Better Climate, Energy, Sustainability + Resilience Solutions



Public domain ([SoccerFan](#) (update to a map done by [Bogdan](#))

Collective Intelligence  
Beats Artificial Intelligence

# Why AI isn't going to solve Facebook's fake news problem

*Moderation will always be a problem on a platform this huge*

By James Vincent | [@jjvincent](#) | Apr 5, 2018, 2:23pm EDT

   SHARE



facebook

# Facebook outsources its fake news problem to Wikipedia—and an army of human moderators

 Share

 Share

+



# YouTube will use Wikipedia to tackle fake news - but failed to tell Wikipedia

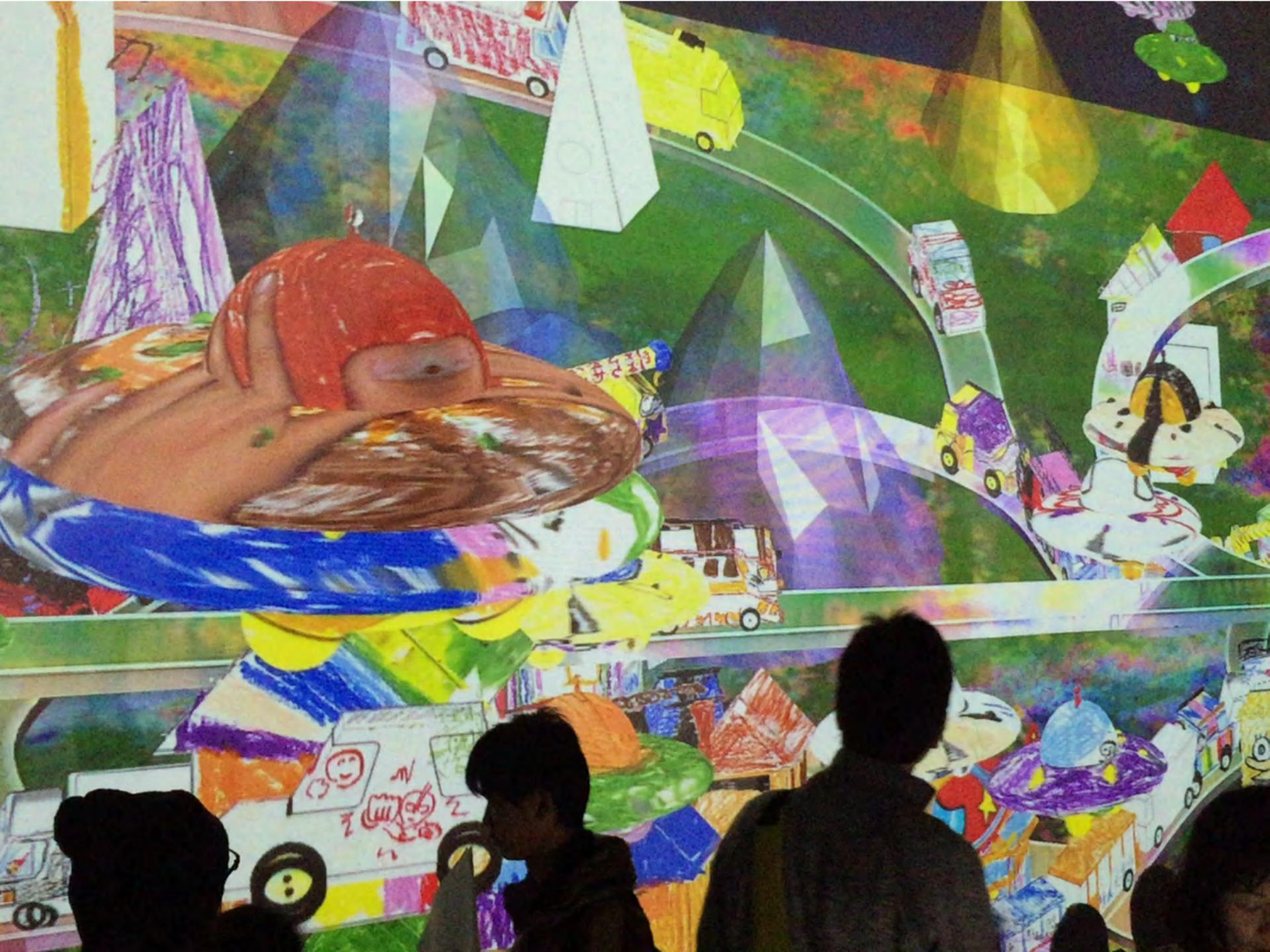


1



YouTube chief executive Susan Wojcicki at SXSW CREDIT: BLOOMBERG

# Personalized Education: Unleashing creativity and personal potentials





















EXIT

PARKING OCCUPANCY 100%

#### GOOGLE HITS THE ROAD

#### How Google's self-driving vehicles work

For a vehicle to drive itself, it must continuously and accurately address these four questions:

Mapping the Environment

Planning the Destination

Controlling the Vehicle

Adapting to the World

#### CHALLENGES

PLEASE  
DO NOT  
TOUCH

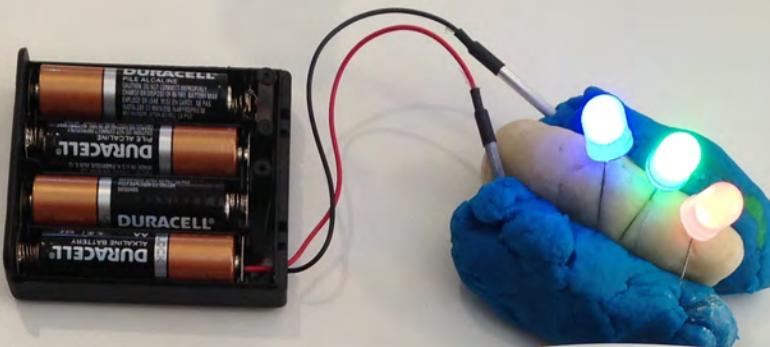
Sunset Ave

8th Street









## HOW YOU CAN TINKER Sculpt Your Own Circuits

We like squishy circuits because they're a perfect mix of tech and art. Plus, the accessible materials you use to craft them are delightfully tactile and creativity-inducing. Just whip up two types of moldable dough in your kitchen and start making magic. Battery packs, LEDs, buzzers, motors, and more will come into play later, depending on what you build.

### START WITH CONDUCTIVE DOUGH

Mix 1 cup (240 mL) water, 1 cup (120 g) flour,  $\frac{1}{4}$  cup (75 g) salt, 3 tablespoons cream of tartar, 1 tablespoon vegetable oil, and some drops of food coloring in a pot over medium heat. Stir continuously as the mixture boils and thickens, and keep on stirring until it forms a ball in the pot's center. Let it cool slightly and knead it on a floured surface until it's nice and smooth. Store it in an airtight container; it will stay malleable for weeks.



**NOW FOR THE INSULATING DOUGH**  
To make complicated circuits, you need a nonconductive dough, too. Mix 1 cup (120 g) flour,  $\frac{1}{2}$  cup (100 g) sugar, and 3 tablespoons vegetable oil in a bowl. Then incorporate up to  $\frac{1}{2}$  cup (120 mL) distilled water in tiny increments (about 1 tablespoon at a time) until the dough forms a cohesive lump. Knead it in a little more flour until it's easy to mold with your hands. You can store this dough just like its conductive doppelganger.

**MOVE ON TO COMPLEX BUILDS** Now that you've got a simple LED under your belt, try replacing it with a DC motor or buzzer—just remember, you may need to use more powerful batteries to put some components into action. You can also play with parallel circuits, in which electricity is allowed to flow through multiple components independently of one another (like the dark green circuit below). Or experiment with series circuits, in which components are linked together across sections of resistive dough and rely on each other to transmit current from one to the next (like the playdough inspire you to craft ones that are both functional and expressive.



**PUT YOUR DOUGHS TO USE** Grab two lumps of conductive dough, and poke one leg of each LED into each one. Take the two leads of a battery pack and stick the positive one into the lump with the LED's positive leg, and the negative one into the lump with the LED's negative leg. See the light go on? Bingo—that's your first squishy circuit. You always need a gap between your negative and positive dough lumps, so next try placing some insulating dough between them to divert electricity from the battery pack into your LED. This allows for more solid construction without any shorts.

# Nintendo is bringing Labo to schools across North America this year

*A pilot program is already underway in New York*

By [Andrew Webster](#) | Oct 23, 2018, 8:00am EDT

[!\[\]\(8eed8cbbb83d6c59a4f97969e09cd314\_img.jpg\)](#) [!\[\]\(f5ef1d2f19b314f5e44d5cb8847d1723\_img.jpg\)](#) [!\[\]\(c30d1788498bdd7d902b42093ad47293\_img.jpg\)](#) [SHARE](#)



**MOST READ**



[MacBook Air vs. MacBook Pro: how Apple's laptops compare](#)



NINTENDO  
**SWITCH**™



# Education 4.0

- creative work
- produce information and knowledge, including cultural products
- personalized education
- creativity and imagination
- ability to find relevant information and critically evaluate it
- curate information and to produce new knowledge
- share knowledge, collaborate with others, and create services and products collaboratively
- concentrate on tasks
- flexibly adapt to new opportunities
- interaction- and systems-oriented way of thinking
- digital literacy and good education will be more important than ever

Source: The Automation of Society Is Next

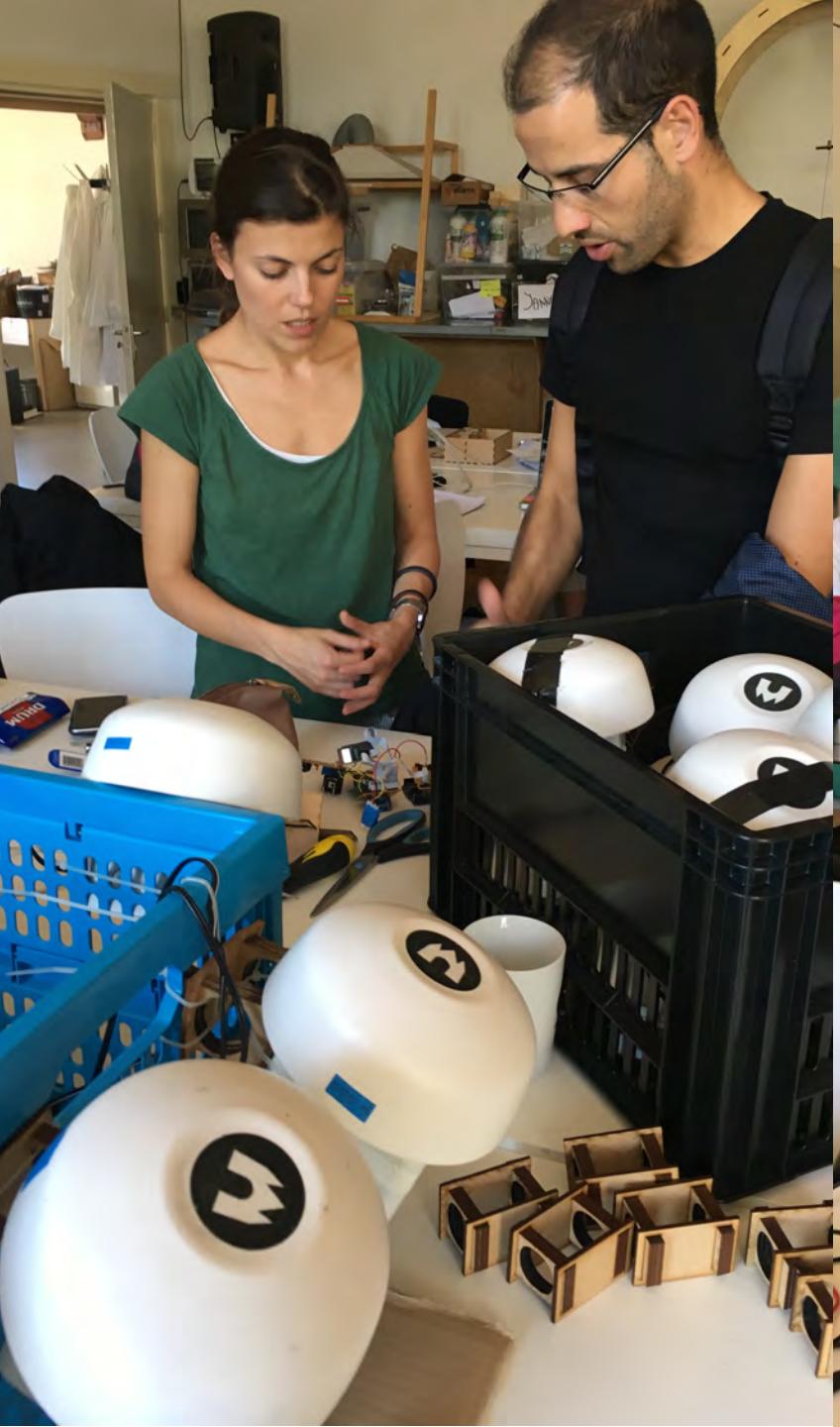
# Massive Open Online Courses

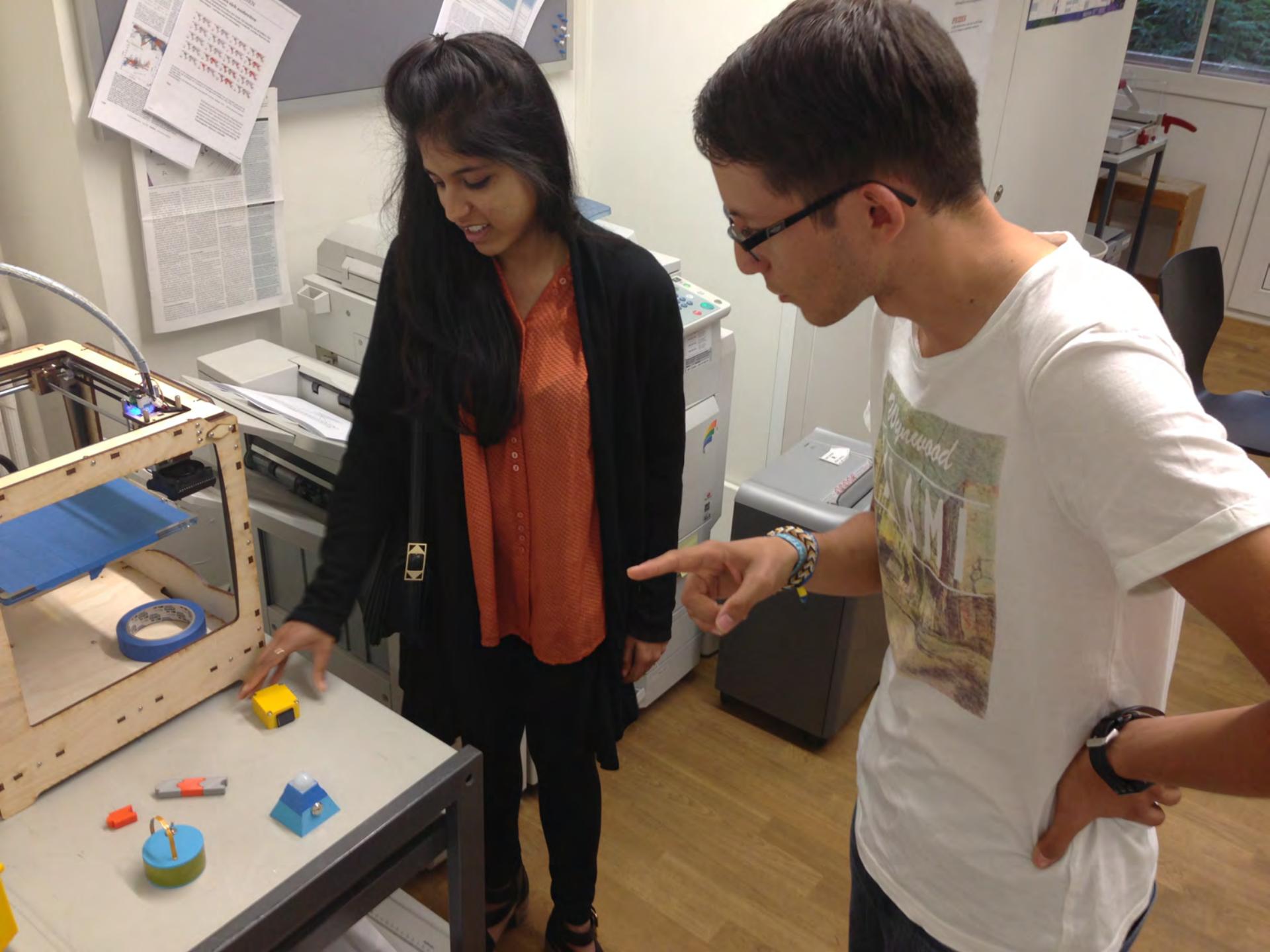
# Learning Platforms



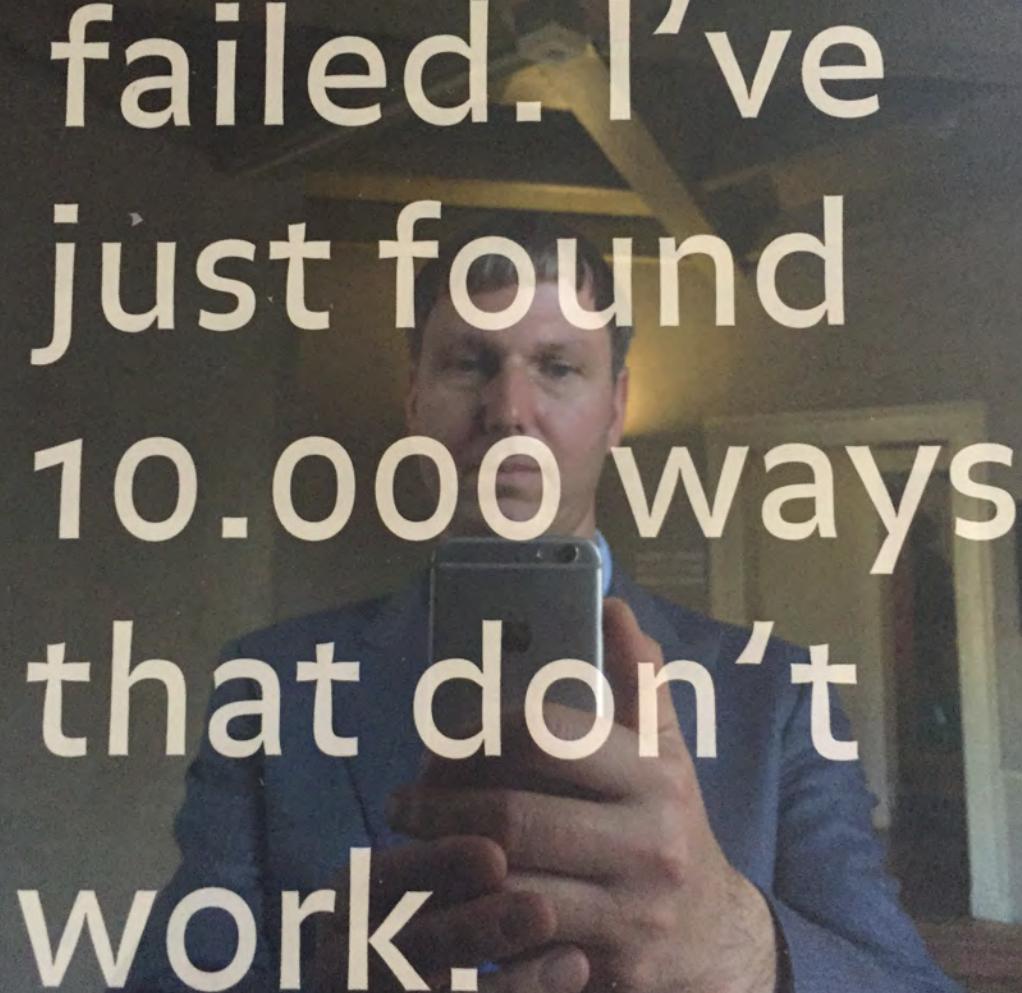








I have not failed. I've just found 10.000 ways that don't work.

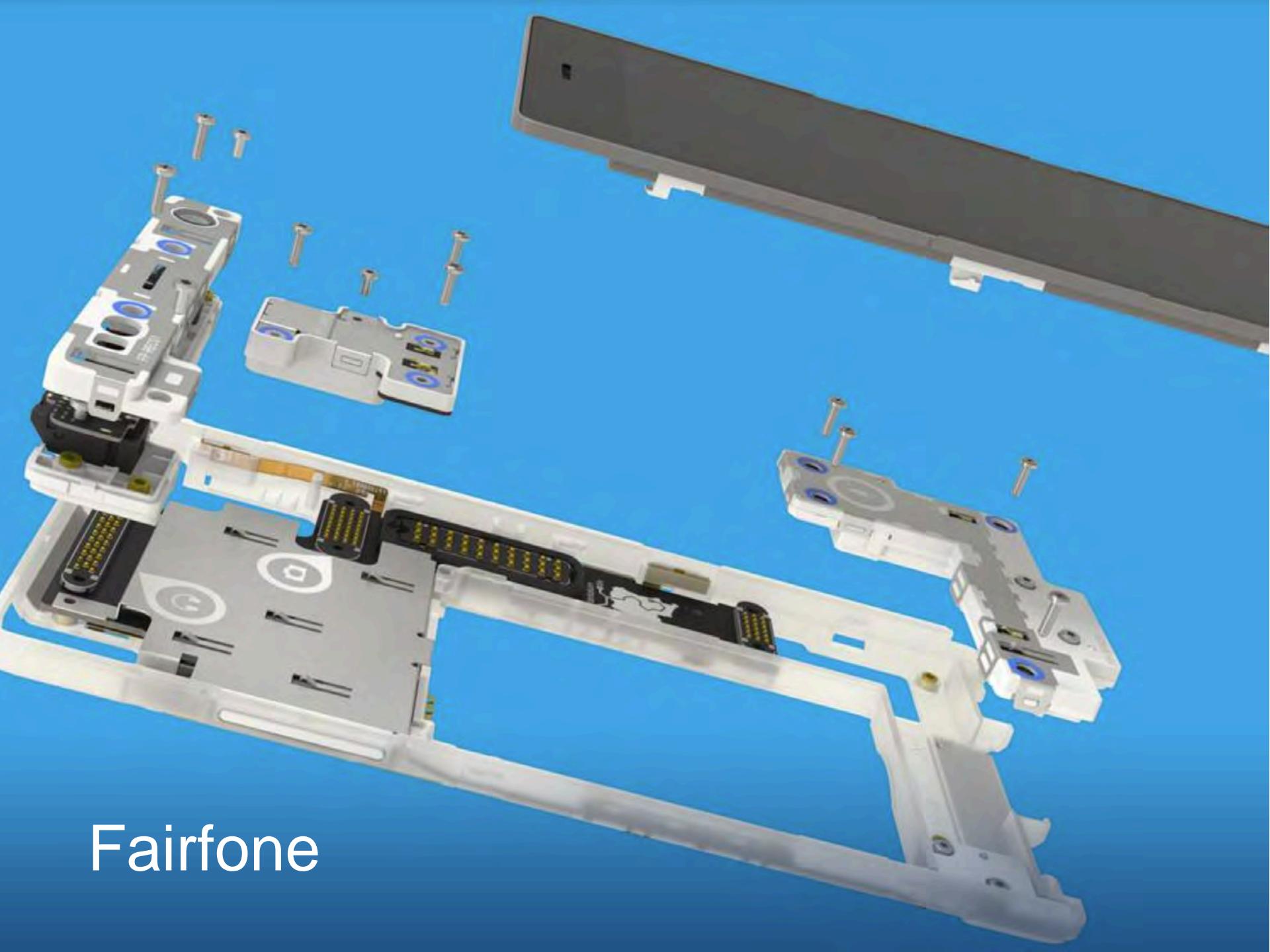
A photograph of a man with short brown hair, wearing a blue button-down shirt. He is looking down at a silver smartphone held in his right hand. The background is dark and out of focus, showing some yellow and white shapes that could be architectural elements or reflections.

Thomas A.  
Edison





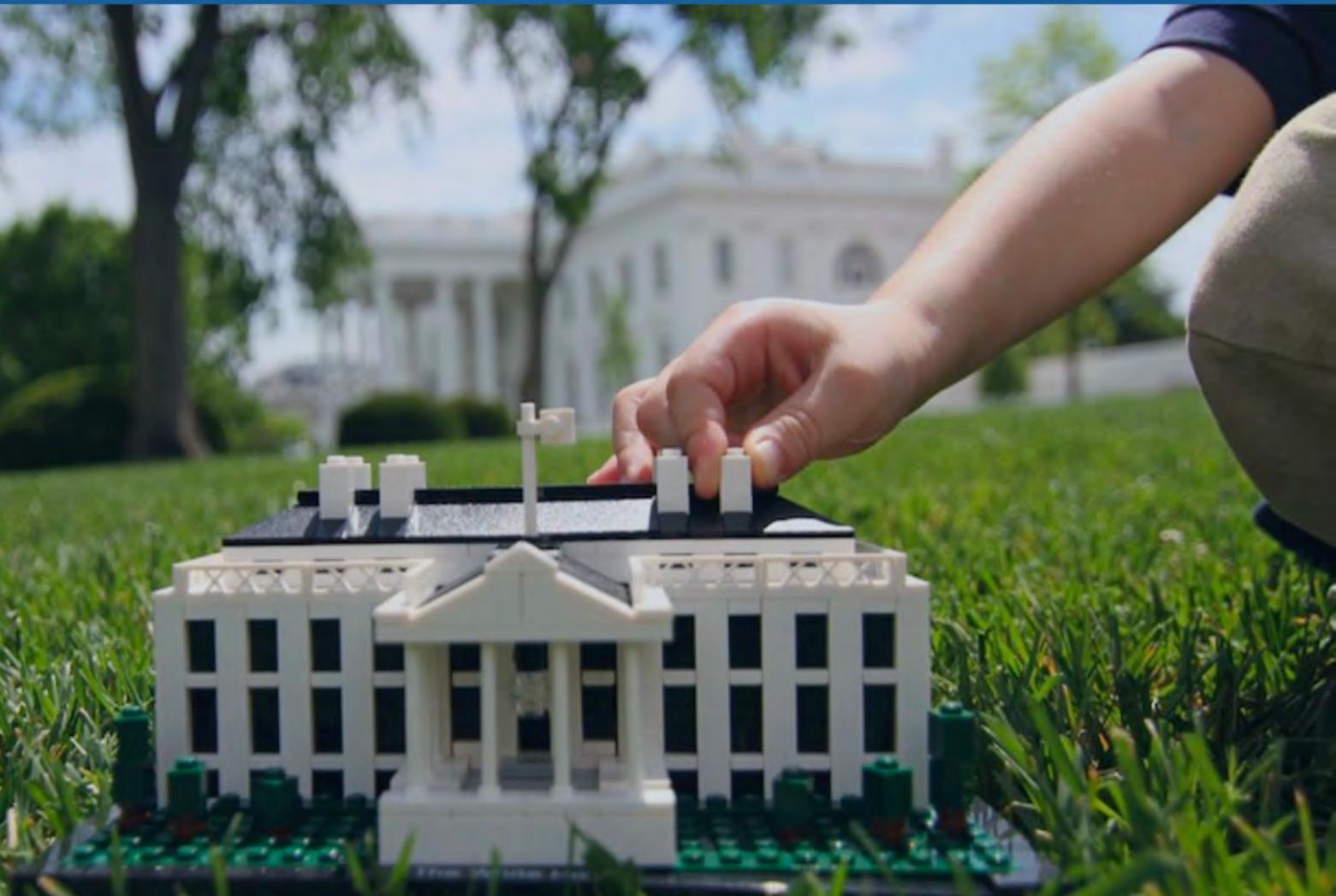




Fairfone

# Fablabs Around the World





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**NATION OF MAKERS**

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# Augmented Reality

Turn beginners into professionals





CREATIVITY

Shutterstock



# The 7C's: Success Principles for a Complex World

- Co-learning
- Co-creation
- Combinatorial innovation
- Co-ordination
- Co-operation
- Co-evolution
- Collective intelligence

Be a game changer!