Big Data, Industrie 4.0

und was sonst so passiert

Till Hänisch, DHBW-Heidenheim, 2016

www.tillh.de/Trends40.pdf

Rogue waves

Incoming!

A new system that warns of potentially ship-destroying ocean waves

STORMY seas can wreak havoc on ships and oil rigs, but the damage they do pales beside that which a rogue wave can dole out. These behemoths, which may be up to 30 metres (100 feet) high, can badly damage, and even sink, all but the largest merchant vessels. They form when smaller, harmless waves meld into one. Until now, predicting them has proved impossible. But Will Cousins and Themistoklis Sapsis, two mechanical engineers at the Massachusetts Institute of Technology, think they have cracked the problem.

Most ocean waves move independently of one another. Sometimes, though, they travel in groups. Waves within a group have the potential to share energy via a phenomenon called modulation instability, in which one wave grows at the expense of the others and all of the group's power is thus concentrated into it.

Past teams of researchers who have attempted to predict such rogues have tried monitoring every wave in a region using radar, and then forecasting the behaviour of each of them. This needs a lot of processing power—far more than is carried on board an average merchant vessel. Moreover, it can take hours to run the calculation, which rather diminishes its value. Yet Dr Cousins and Dr Sapsis suspected they could bypass these problems by ignoring most of the waves in an area and homing in on only a tiny, relevant subset of them.

Big Data

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Big Data

At last – a computer program that can beat a champion Go player PAGE 484

ALL SYSTEMS GO

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Big Data

Künstliche Intelligenz

At last – a computer program that can beat a champion Go player PAGE 484

ALL SYSTEMS GO

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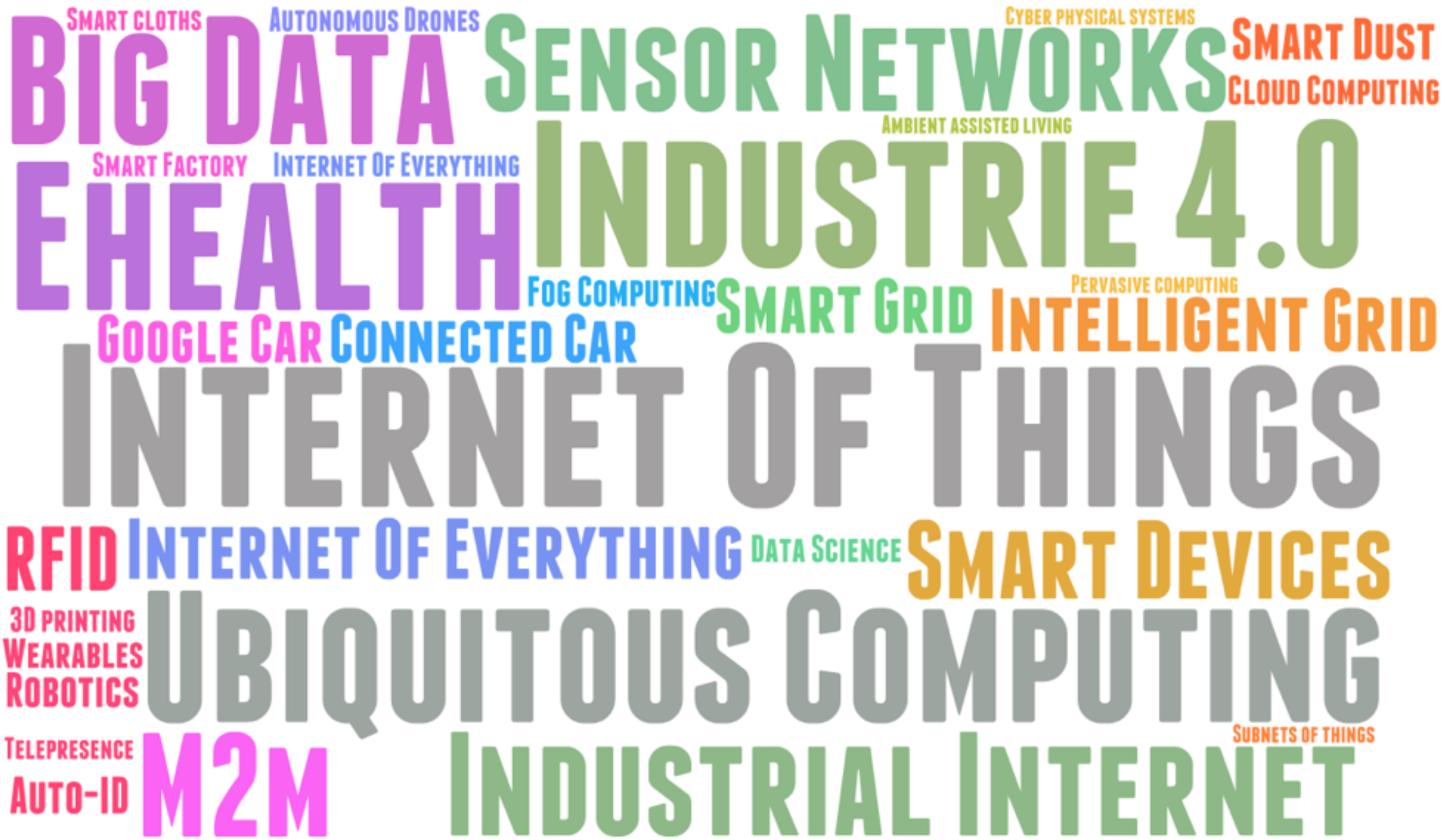
„Winner takes all“ Märkte

Microsoft
Apple
google
amazon
facebook
WhatsApp
Uber

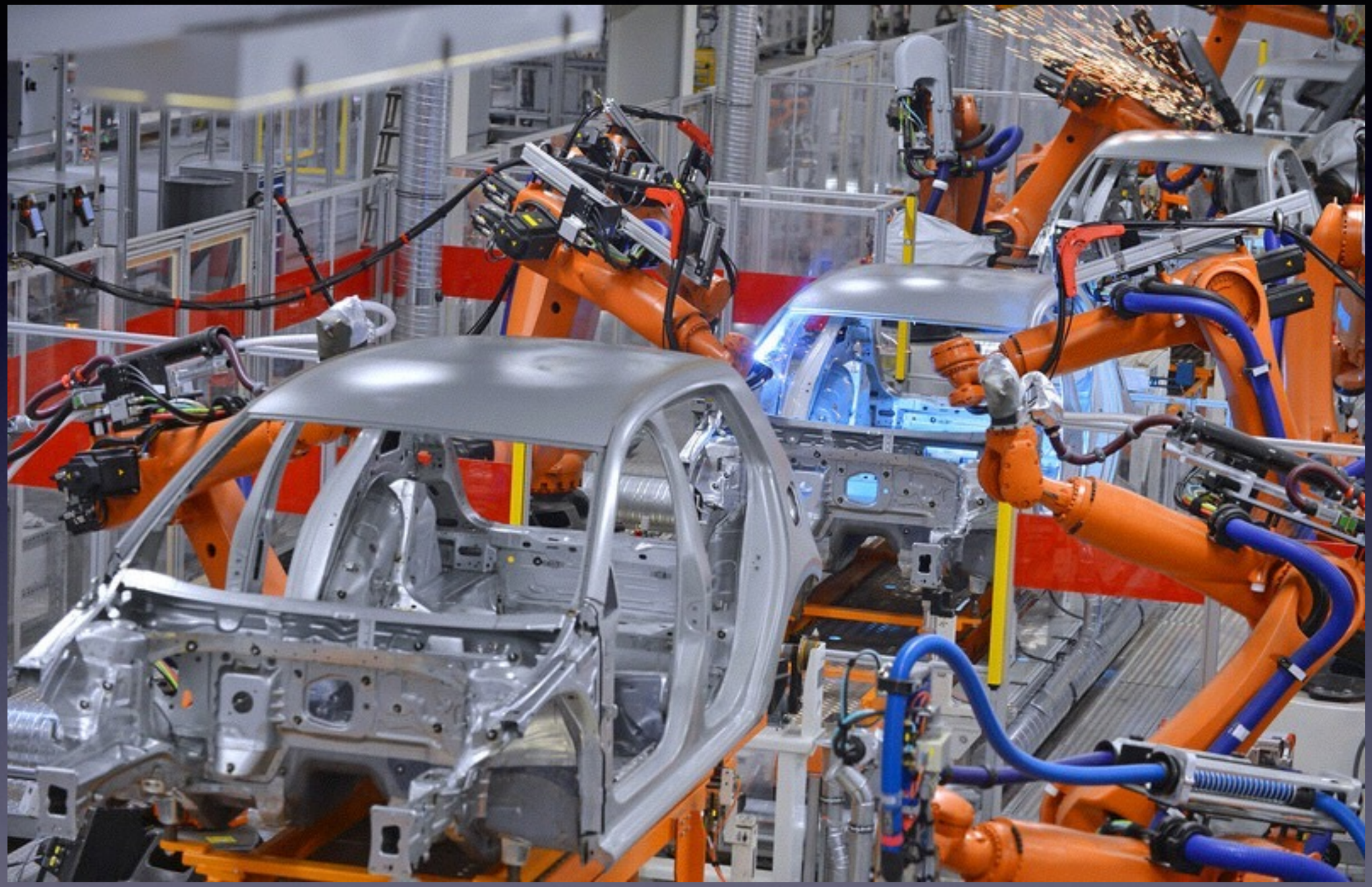
beherrschen „ihre“ Märkte

Warum ? —> „Zero marginal cost“

Konsequenzen ?


Smart cloths
Autonomous Drones
Cyber physical systems
Big Data
Sensor Networks
Smart Dust
Cloud Computing
Ambient assisted living
Smart Factory
Internet Of Everything
eHealth
Industrie 4.0
Fog Computing
Smart Grid
Pervasive computing
Intelligent Grid
Google Car
Connected Car
Internet of Things
RFID
Internet Of Everything
Data Science
Smart Devices
3D printing
Wearables
Robotics
Ubiquitous Computing
Subnets of things
Telepresence
Auto-ID
M2M
Industrial Internet

Industrieroboter



Roboter

www.bostondynamics.com

Roboter

www.bostondynamics.com

3D Druck mal anders

http://www.multivu.com/players/uk/7565251-dubai-first-3d-printed-office/

Welcome to the Drone Age: Autonomous vehicles

FAA-Vorhersage von 2010:
Im Jahr 2020 15.000 Drohnen insgesamt

Realität 2015: > 15.000 Drohnen pro Monat !

The Economist, Sept. 2015

reddit linux Kommentare Ähnlich andere Diskussionen (5)

1578 /bin (i.imgur.com)
eingereicht 2 Jahre zuvor von strolls
172 Kommentare Weitersagen

Alle 172 Kommentare - sortiert nach: beste
[–] 3van 343 Punkte 2 Jahre zuvor
That feeling when a trash can is running a newer kernel than most of your machines at work.
Permalink Speichern Schenke Gold

Big Data:

Big Data ist der Übergang

- von qualitativen zu quantitativen Methoden
- vom (abstrahierten) Modell zur Daten über die Realität
- zu immer detaillierteren Daten immer näher am Jetzt
- von Stichproben zu N=alle
- von data base zu data science
- von Deduktion zu Induktion
- von Kausalität zu Korrelation

bei der Bildung von Hypothesen

Big Data:

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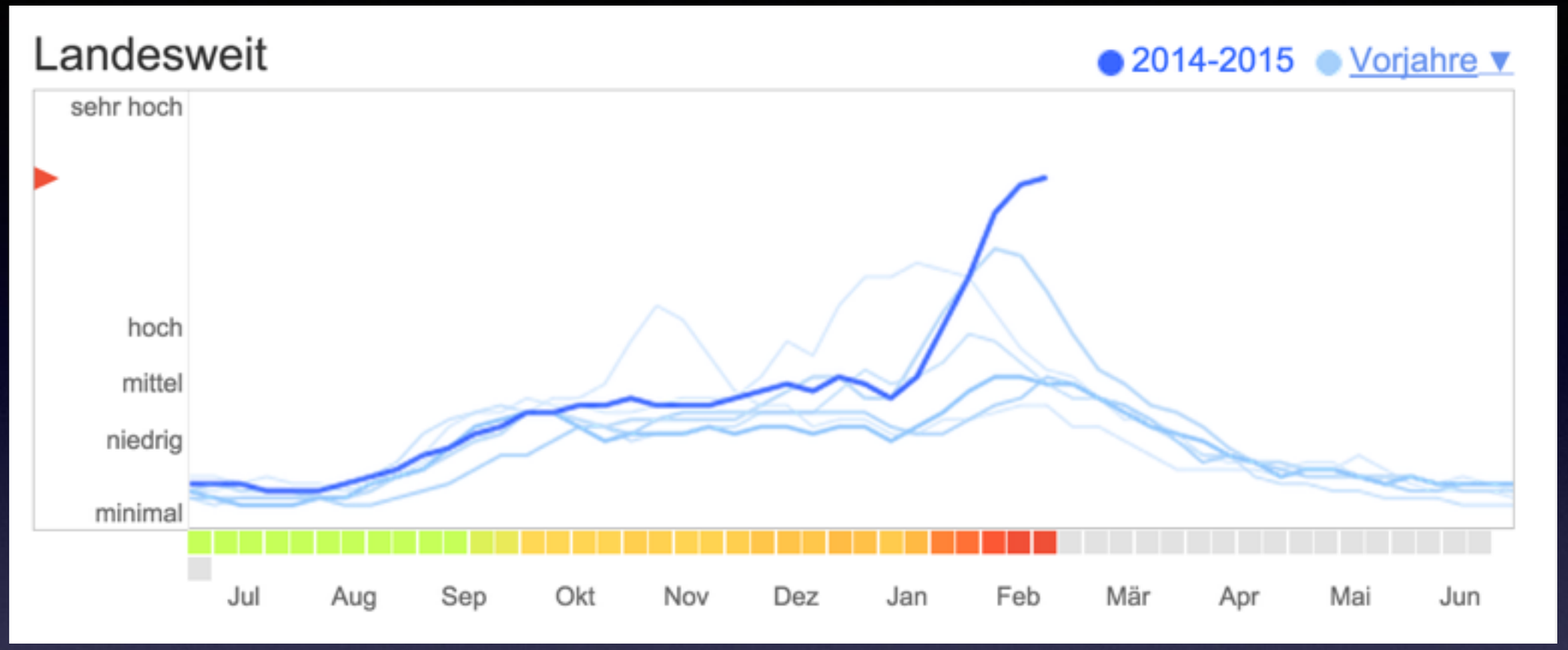
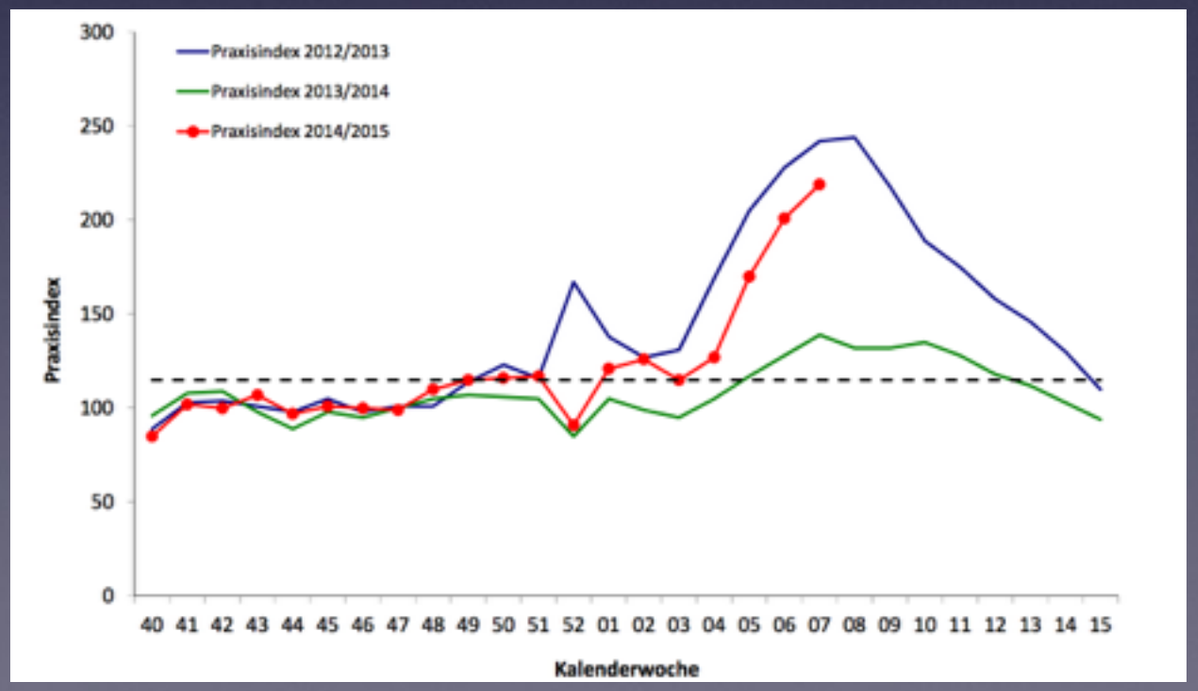
bei der Bildung von Hypothesen

Hypothese: Die durch „Nachdenken“ findbaren
Hypothesen sind bereits gefunden, weitere werden durch
(statistische) Analyse der vollständigen Daten erschlossen

Beispiel: google flu trends



[http://www.google.org/flutrends/de/#DE]



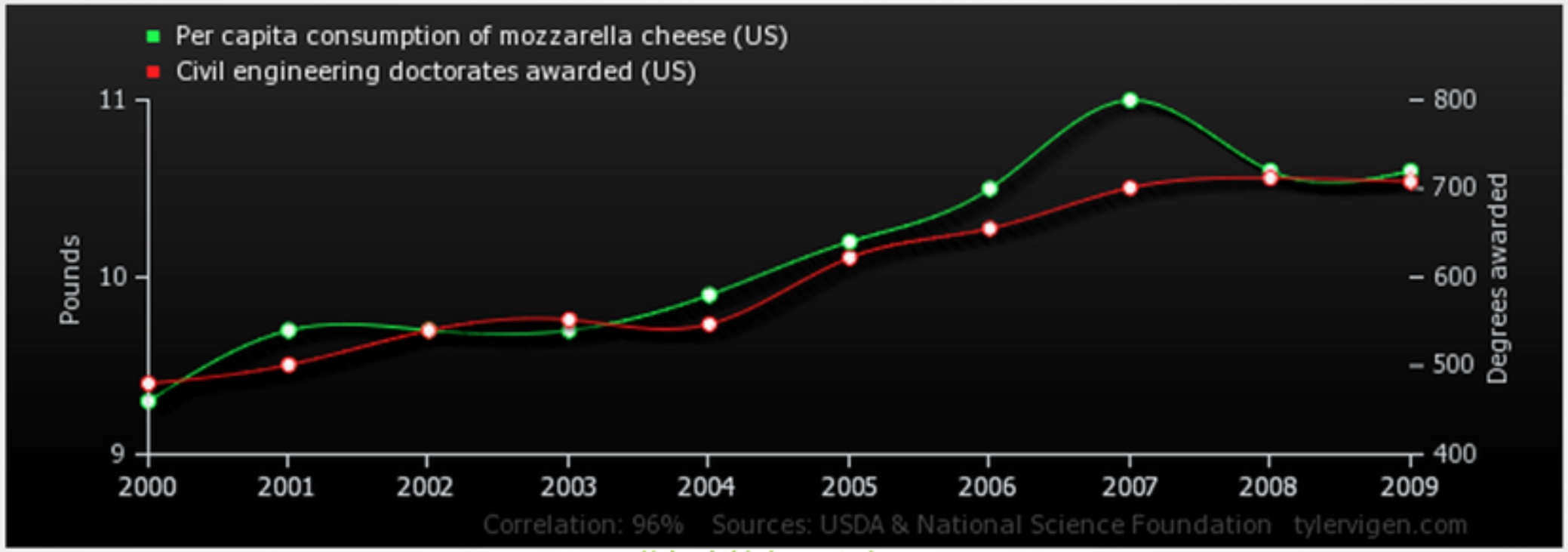
[https://influenza.rki.de/Wochenberichte/2014_2015/2015-07.pdf]

Kausalität

Per capita consumption of mozzarella cheese (US)

correlates with

Civil engineering doctorates awarded (US)



Upload this image to imgur

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Per capita consumption of mozzarella cheese (US) *Pounds (USDA)*	9.3	9.7	9.7	9.7	9.9	10.2	10.5	11	10.6	10.6
Civil engineering doctorates awarded (US) *Degrees awarded (National Science Foundation)*	480	501	540	552	547	622	655	701	712	708

Correlation: 0.958648

http://www.tylervigen.com/view_correlation?id=3890

Reality check

Till Haenisch,

Sie suchen Produkte aus der Kategorie Bücher über Business & Karriere? Dann haben wir die folgende Auswahl für Sie.

Bücher über Business & Karriere

Internet der Dinge: Technik, Trends und Geschäftsmodelle
Volker P. Andelfinger, Till Hänisch

Preis: **EUR 34,99** Prime

Weitere Informationen

Auf meinen Wunschzettel

Internet der Dinge: www.internet-der-dinge.de (VDI-Buch)
Hans-Jörg Bullinger, Michael ten Hompel

Preis: **EUR 97,99** Prime

Weitere Informationen

Auf meinen Wunschzettel

› Weitere ähnliche Artikel anzeigen

Reality Check

27.11.2014 15:37 « Vorige | Nächste »

Minority Report auf bayrisch: Musterbasierte Verbrecherjagd mit Precobs angeblich erfolgreich

vorlesen / MP3-Download

Kriminaldirektor Karl Geyer erklärt im Nürnberger Polizeipräsidium die neue Software, die Einbrüche vorhersagen können soll. (Bild: dpa)

Alarm in Planquadrat xy: Die Polizei fährt los und verhaftet den Täter womöglich noch vor der Tat. Der Einsatz des Pre Crime Observation Systems in München und Mittelfranken ist nach Aussagen des bayerischen Innenministers vielversprechend angelaufen.

Die Software Precobs, mit der Einbrüche vorhergesagt werden soll, hat sich bewährt. Das teilt das bayerische Innenministerium mit. Die Software des Institutes für musterbasierte Prognosetechnik (IfmPt) wird seit Anfang September in Nürnberg und München getestet. Innenminister Joachim Herrmann will die bis Mai 2015 laufende Machbarkeitsstudie mit der polizeilichen Verbrechens-Progonosesoftware nun auf ganz Bayern ausdehnen.

New York City Police Department and Microsoft Partner to Bring Real-Time Crime Prevention and Counterterrorism Technology Solution to Global Law Enforcement Agencies

Police in Modesto, California are attributing a recent crime drop to special software reminiscent of the Hollywood blockbuster "Minority Report."

Predictive policing software, which utilizes mathematical algorithms often used in earthquake prediction, examines several years' worth of crime and sociological data in order to predict where a crime will likely occur down to a 500-square-foot area.

[http://www.heise.de/newsticker/meldung/Minority-Report-auf-bayrisch-Musterbasierte-Verbrecherjagd-mit-Precobs-angeblich-erfolgreich-2467490.html]

Reality Check

US government and private sector developing ‘precrime’ system to anticipate cyber-attacks

Crime-predicting technology at work in Stephen Spielberg's 'Minority Report' (2002)

Reali

US g

‘pre

Crime-pr

26.02.2015 11:08

« Vorige | Nächste »

Precrime per Predictive Policing: Das Internet der Dinge im Zeugenstand

vorlesen / MP3-Download

Den Vorträgen auf dem europäischen Polizeikongress 2015 zufolge ist Predictive Policing das nächste große Ding in der computerunterstützen Polizeiarbeit. Mit den Daten vom Internet der Dinge gekoppelt, werden virtuelle Zeugen die Kriminalistik umkrempeln.

Reali

US g

‘pre

Crime-pr

26.02.2015 11:08

« Vorige | Nächste »

Precrime per Predictive Policing: Das Internet der Dinge im Zeugenstand

vorlesen / MP3-Download

COMMENTS

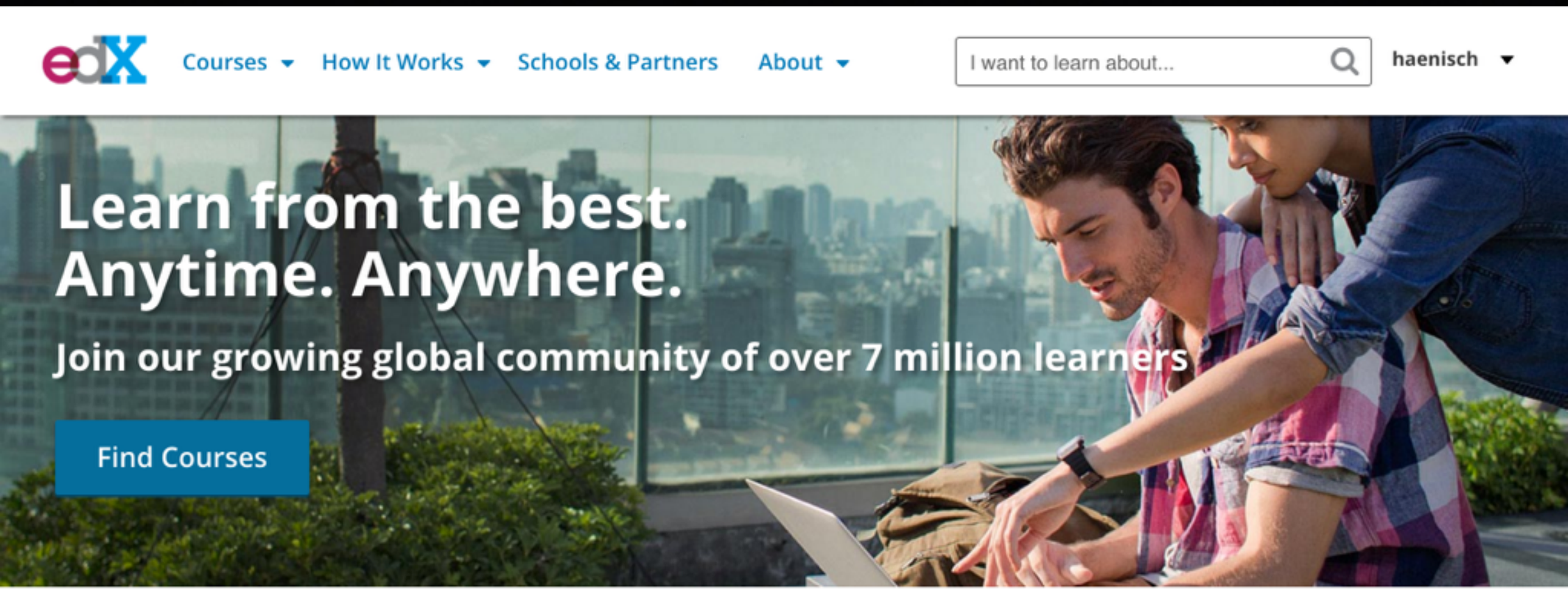
The minority report: Chicago's new police computer predicts crimes, but is it racist?

Chicago police say its computers can tell who will be a violent criminal, but critics say it's nothing more than racial profiling

By Matt Stroud *on February 19, 2014 09:31 am*

Den Vorträgen auf dem europäischen Polizeikongress 2015 zufolge ist Predictive Policing das nächste große Ding in der computerunterstützen Polizeiarbeit. Mit den Daten vom Internet der Dinge gekoppelt, werden virtuelle Zeugen die Kriminalistik umkrempeln.

Massive Open Online Courses:



It Takes a B.A. to Find a Job as a File Clerk

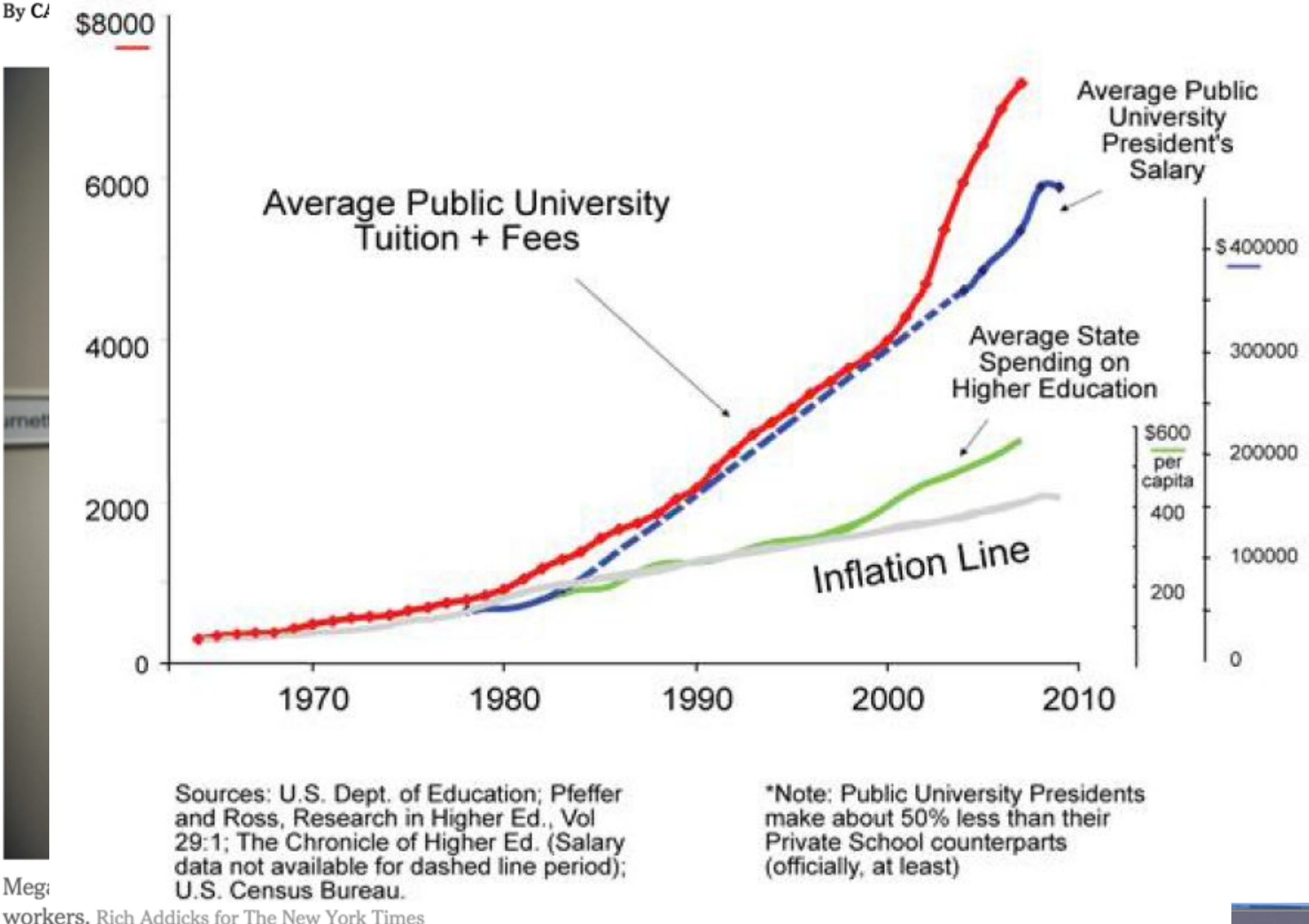
By CATHERINE RAMPELL FEB. 19, 2013

Megan Parker, right, a law firm receptionist, and Laura Burnett, a paralegal, are college graduates, as are all their co-workers. Rich Addicks for The New York Times

http://www.nytimes.com/2013/02/20/business/college-degree-required-by-increasing-number-of-companies.html?_r=1

It Takes a B.A. to Find a Job as a File Clerk

By CA

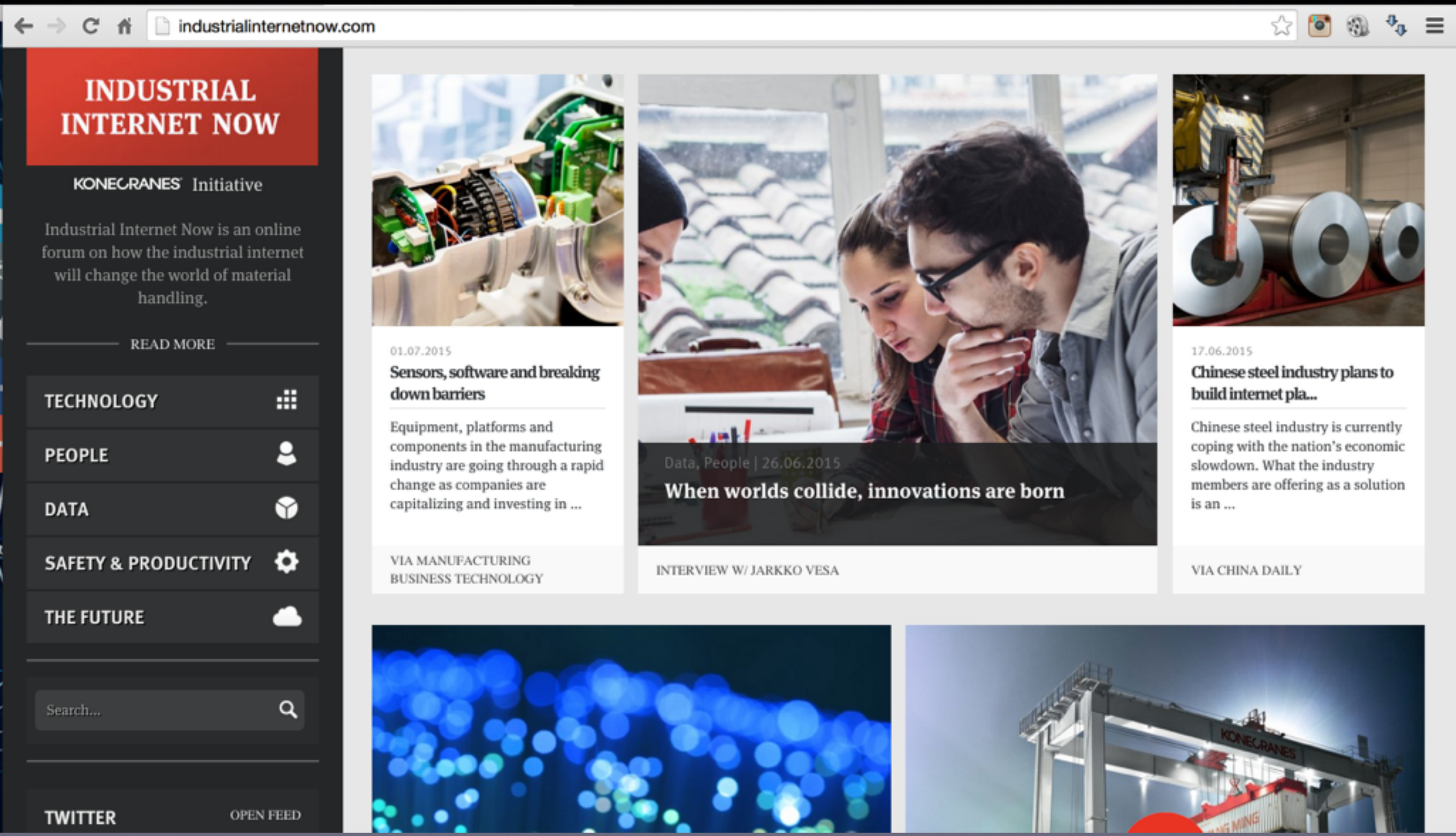


workers. Rich Addicks for The New York Times

http://watchdog.org/152180/nm-the-lean-college-a-no-frills-alternative-for-higher-education/

http://www.nytimes.com/2013/02/20/business/college-degree-required-by-increasing-number-of-companies.html?_r=1

Industrial Internet



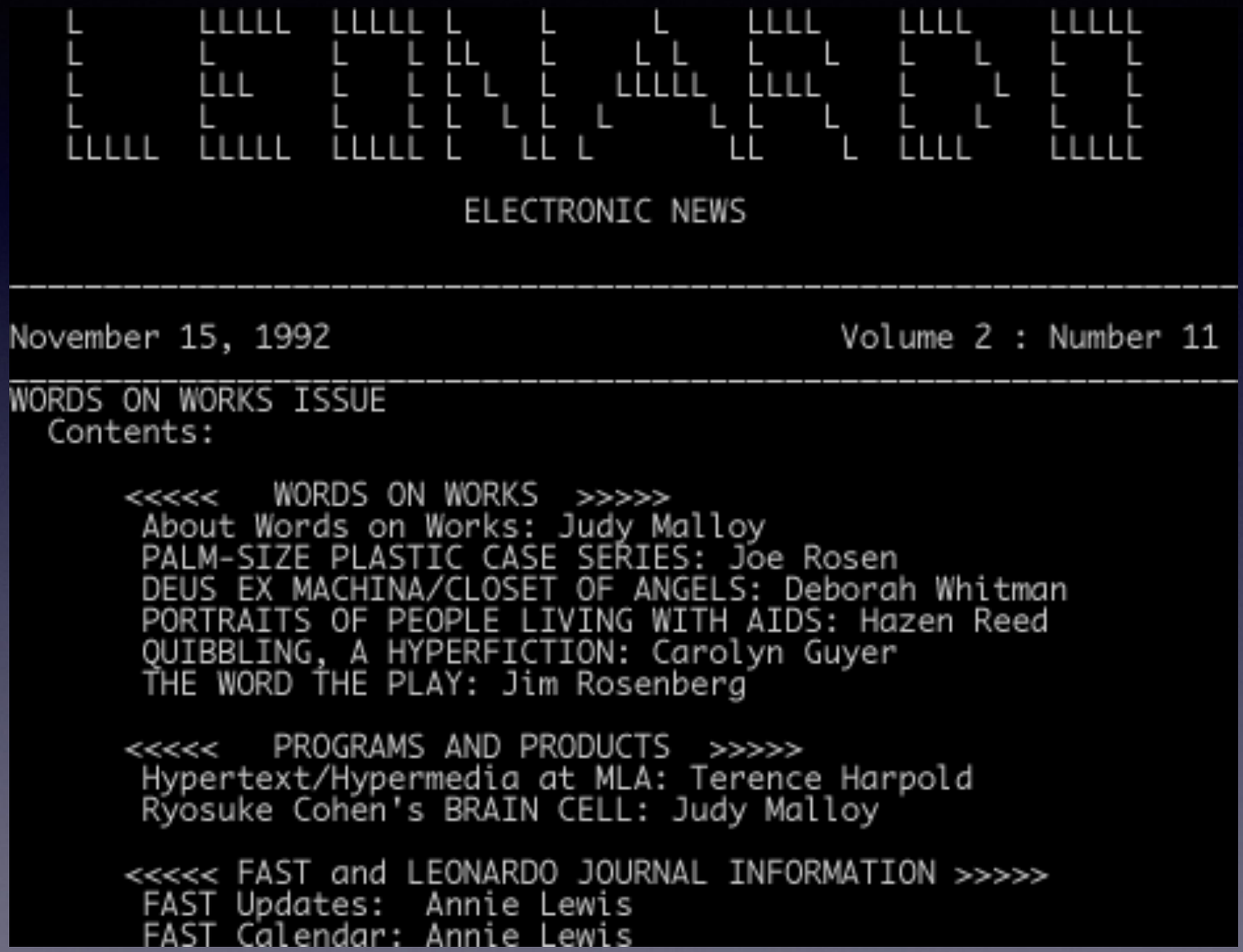

COMPLEX THING
THIS IS ...
imgflip.com

Was kommt danach ?

Was war davor ?

Eine kurze Geschichte des Internets

Mailboxes, Usenet: Die Anfänge



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   L       LLL    L   L L L   L    LLLLL   LLLL     L    L   L   L
   L       L      L   L L  L  L L  L       L  L     L   L    L   L
   LLLLL   LLLLL  LLLLL L   LL L         LL    L   LLLL     LLLLL

                        ELECTRONIC NEWS

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November 15, 1992                                  Volume 2 : Number 11

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WORDS ON WORKS ISSUE
  Contents:

      <<<<<   WORDS ON WORKS  >>>>>
       About Words on Works: Judy Malloy
       PALM-SIZE PLASTIC CASE SERIES: Joe Rosen
       DEUS EX MACHINA/CLOSET OF ANGELS: Deborah Whitman
       PORTRAITS OF PEOPLE LIVING WITH AIDS: Hazen Reed
       QUIBBLING, A HYPERFICTION: Carolyn Guyer
       THE WORD THE PLAY: Jim Rosenberg

      <<<<<   PROGRAMS AND PRODUCTS  >>>>>
       Hypertext/Hypermedia at MLA: Terence Harpold
       Ryosuke Cohen's BRAIN CELL: Judy Malloy

      <<<<< FAST and LEONARDO JOURNAL INFORMATION >>>>>
       FAST Updates:  Annie Lewis
       FAST Calendar: Annie Lewis
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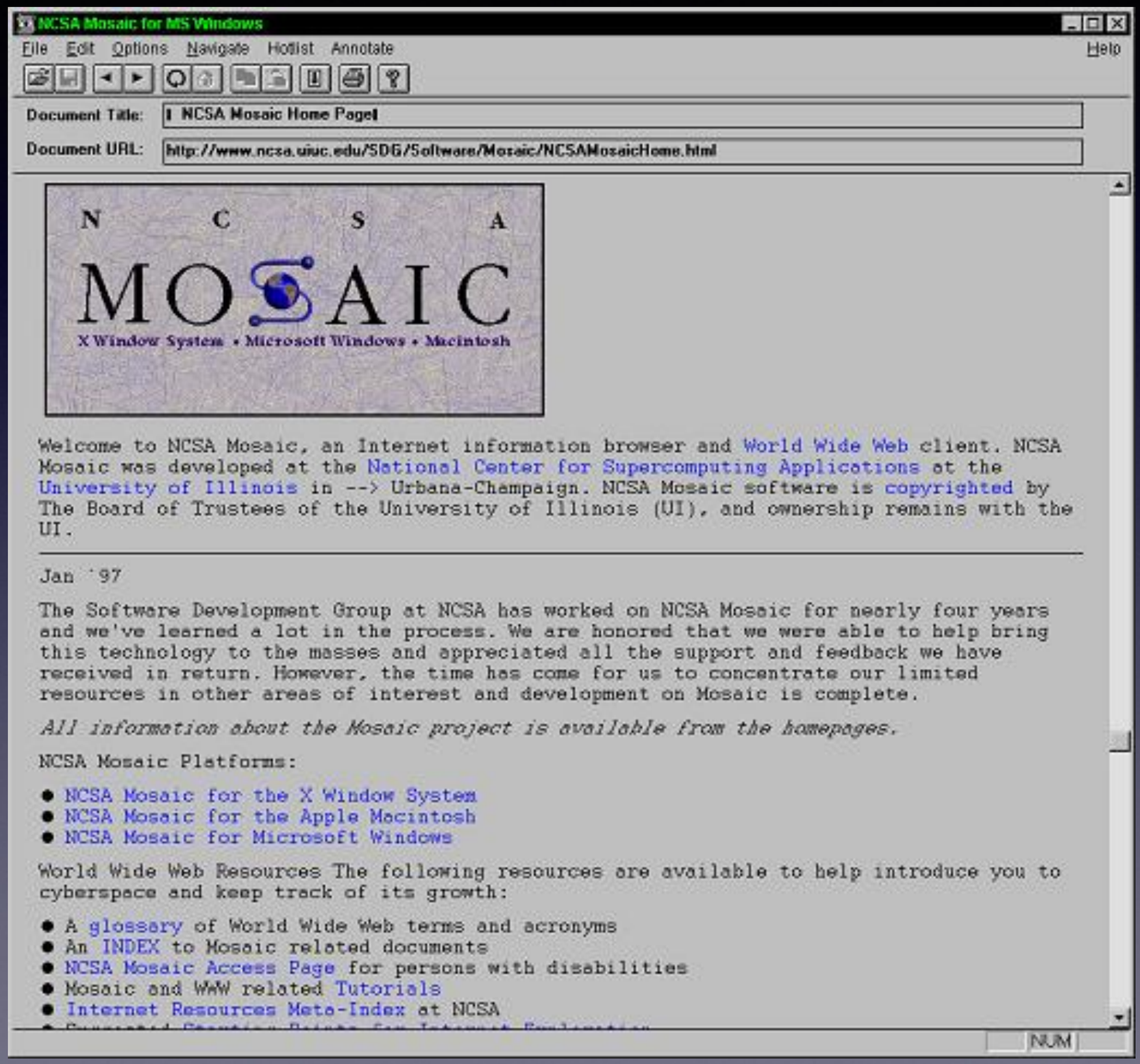
Das WWW


NCSA Mosaic for MS Windows
File Edit Options Navigate Hotlist Annotate Help
Document Title: NCSA Mosaic Home Page!
Document URL: http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html
N C S A
MOSAIC
X Window System • Microsoft Windows • Macintosh
Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in --> Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.
Jan '97
The Software Development Group at NCSA has worked on NCSA Mosaic for nearly four years and we've learned a lot in the process. We are honored that we were able to help bring this technology to the masses and appreciated all the support and feedback we have received in return. However, the time has come for us to concentrate our limited resources in other areas of interest and development on Mosaic is complete.
All information about the Mosaic project is available from the homepages.
NCSA Mosaic Platforms:
NCSA Mosaic for the X Window System
NCSA Mosaic for the Apple Macintosh
NCSA Mosaic for Microsoft Windows
World Wide Web Resources The following resources are available to help introduce you to cyberspace and keep track of its growth:
A glossary of World Wide Web terms and acronyms
An INDEX to Mosaic related documents
NCSA Mosaic Access Page for persons with disabilities
Mosaic and WWW related Tutorials
Internet Resources Meta-Index at NCSA
NUM

Das WWW


Amazon.com: Online Shopping for Electronics, Apparel, Computers, Books, DVDs & more
http://www.amazon.com/gp/homepage.html/104-3141628-0961534
Google
Amazon Mec... - Welcome
Visaton - La...Accessories
iwascoding.com
Delicious Library
Get the New...nsaver Pack
How to crea... RMI system
Amazon.com: Online Shopp...
amazon.com
Till's Store
See All 34 Product Categories
Your Account | Cart | Your Lists | Help |
Gift Certificates | International | New Releases | Top Sellers | Today'S Deals | Sell Your Stuff
Search
Amazon.com
GO
Find Gifts
Web Search
GO
Hello, Till Haenisch. We have recommendations for you. (If you're not Till Haenisch, click here.)
Browse
Books, Music & Movies
Books
DVD
Magazines & Newspapers
Music
Textbooks
VHS
Clothing & Accessories
Apparel & Accessories
Jewelry & Watches
Shoes
Computer & Office
Computers
Office Products
Software
Consumer Electronics
Audio & Video
Camera & Photo
Cell Phones & Service
Computer & Video Games
All Consumer Electronics
Around the DVD Store
52% off
The Hot List: New DVDs as Low as $15.98
47% off
Hot Future DVD Releases
12% off
DVD Editors' June Picks
Kickin' It with Calvin and Hobbes
34% off
Treat yourself to a break this summer with the The Complete Calvin and Hobbes. You'll get hours of laugh-out-loud fun from this three-volume hardcover set that comes with its own sturdy slipcase and includes all the Calvin and Hobbes cartoons that have ever been syndicated.
Save on World of Warcraft
How on Earth could we offer games so cheaply? Are we crazy? Are we
Sylvania DOT-it Lights
Where do you need light? Get the bright, white LED light that sticks practically anywhere.
Extra Savings on Power and Lawn Tools
Save an Extra 10%
Through July 4, get an extra 10% on your total purchase of power tools and lawn care products from Amazon.com Tools. See details.
› More deals in Tools
Ice Cream Ball
Have a

Social Media

twitter Suchen Hast Du bereits ein Konto? Einloggen

Lady Gaga

@ladygaga New York, NY

mother monster

http://www.ladygaga.com

Folgen

Text **follow ladygaga** to your carrier's shortcode

Updates Favoriten Following Follower Listen

2 neue Tweets

ladygaga Lady Gaga
The single most special moment of my career. Naoto Kan, thank you for the honor. I'll miss you Japan: My Teal Rose http://twitpic.com/5j112a
30 Juni

ladygaga Lady Gaga
TEAL AMBITION performance of BORN THIS WAY in Paris: bit.ly/mocM2d I love it! The Edge of Glory at piano: bit.ly/kdpu9l
30 Juni

ladygaga Lady Gaga
SMAP SMAP REVENGE. BORN THIS WAY TATOO TUXEDO MEETS TARANTINO NINJA. http://twitpic.com/5ii6gm
29 Juni

ladygaga Lady Gaga
INTERVIEW IN JAPAN: GAGAPANDA! PART 1: tinyurl.com/3e6tpyj PART 2: tinyurl.com/6ypg4lo
28 Juni

Folge Lady Gaga auf Twitter

Verpasse keine Updates von Lady Gaga. Melde dich heute an und folge deinen Interessen!

Anmelden »

Fragst du dich, wie Lady Gaga Twitter nutzt?

Entdecke, wem **@ladygaga** folgt

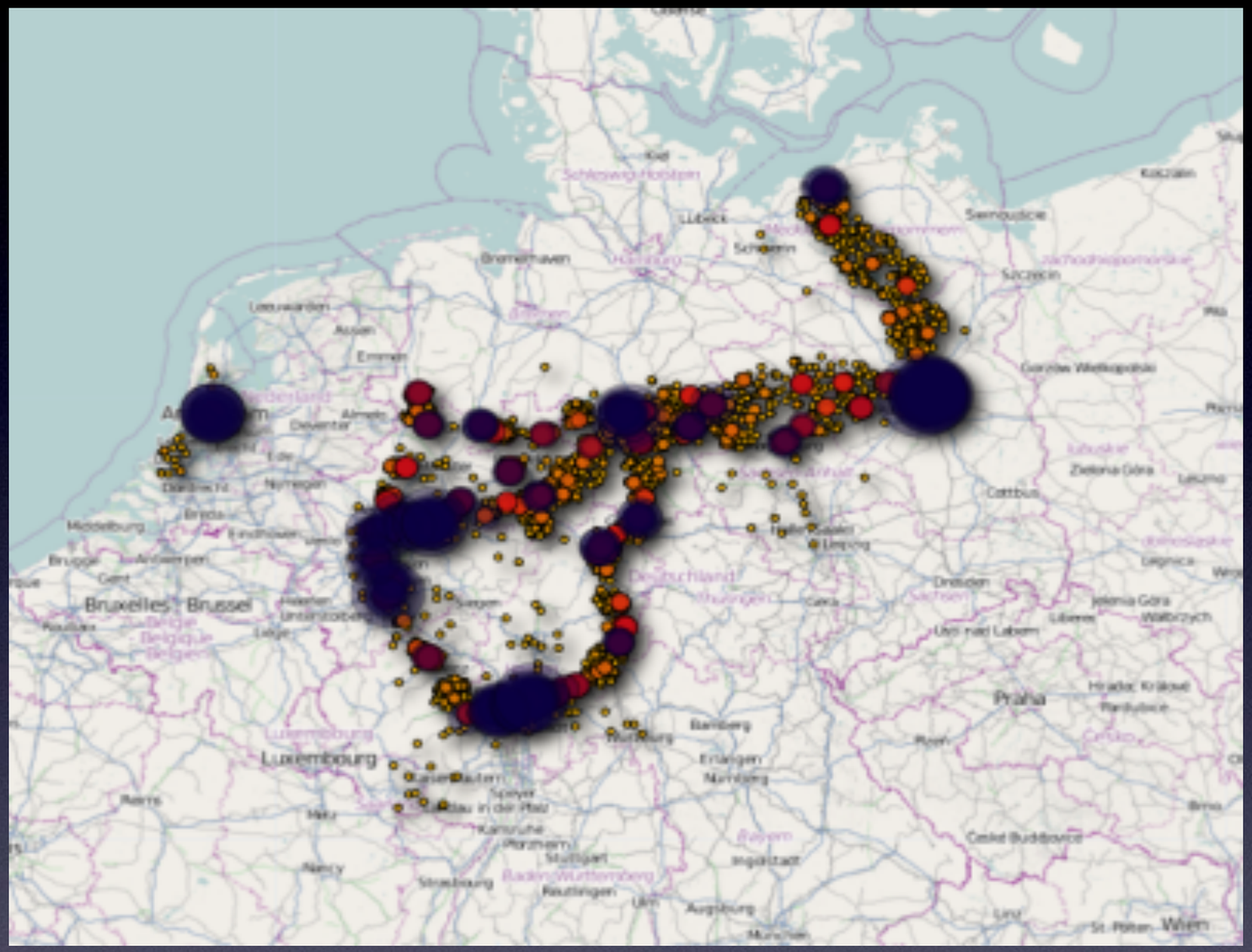
Über @ladygaga

917	142.812	11.334.158	203.565
Tweets	Following	Follower	Gelistet

Über uns Hilfe Blog Handy Status Jobs AGB Sicherheit
Inserenten Unternehmen Medien Entwickler Quellen
© 2011 Twitter

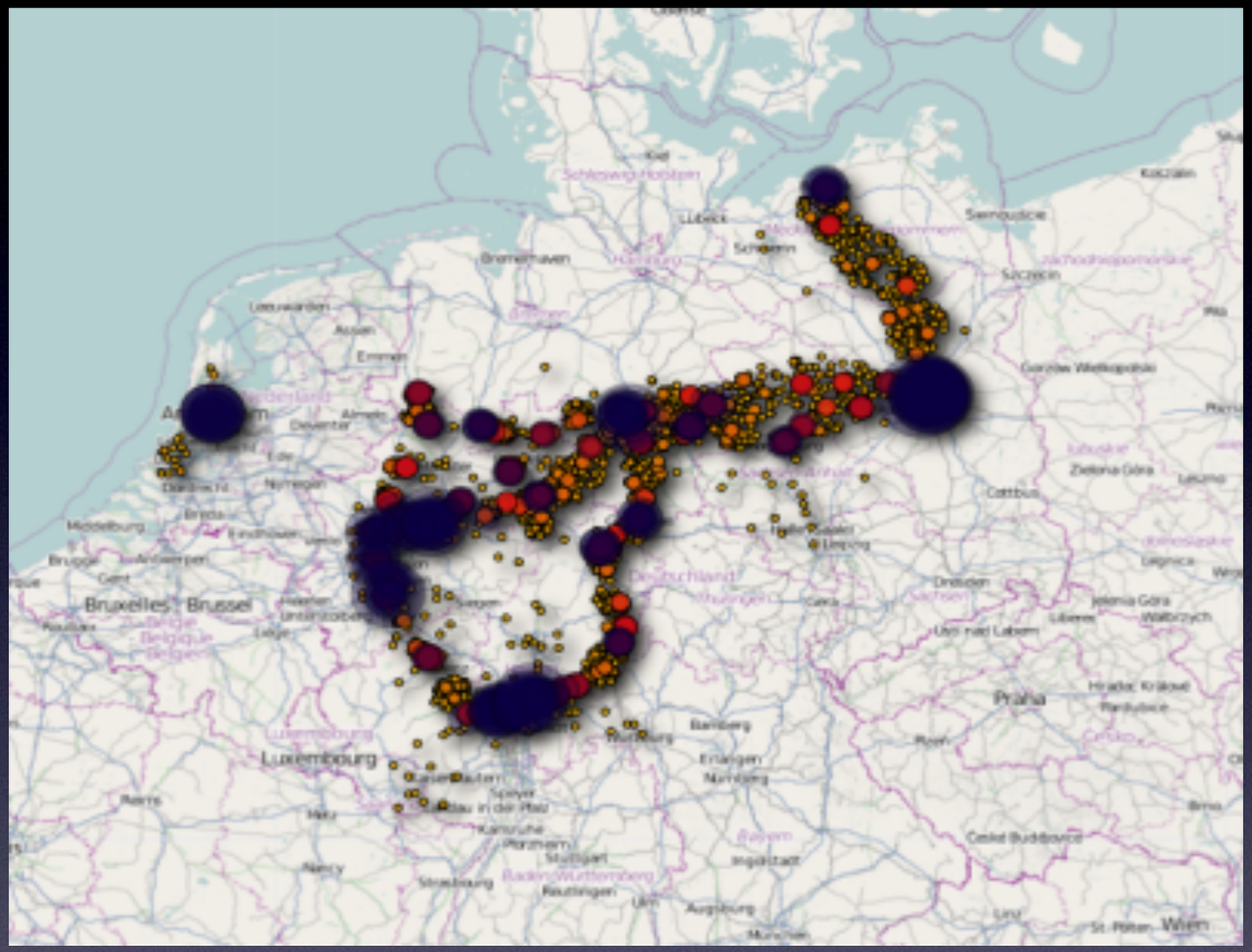
real life Kommunikation

physical web



[http://www.datenschutz.rlp.de/de/presseartikel.php?pm=pm20110426011]
[http://www.zeit.de/datenschutz/malte-spitz-vorratsdaten]

physical web



[http://www.datenschutz.rlp.de/de/presseartikel.php?pm=pm20110426O1]
[http://www.zeit.de/datenschutz/malte-spitz-vorratsdaten]

WWW

Social Web

Physical Web

1990

2005

2020

WWW

Social Web

Physical Web

1990

2005

2020

Mehr Teilnehmer, nicht nur Menschen

WWW

Social Web

Physical Web

1990

2005

2020

Mehr Teilnehmer, nicht nur Menschen

Mehr Verbindung zur realen Welt

WWW

Social Web

Physical Web

1990

2005

2020

Mehr Teilnehmer, nicht nur Menschen

Mehr Verbindung zur realen Welt

keine Revolution sondern Evolution !

M2M

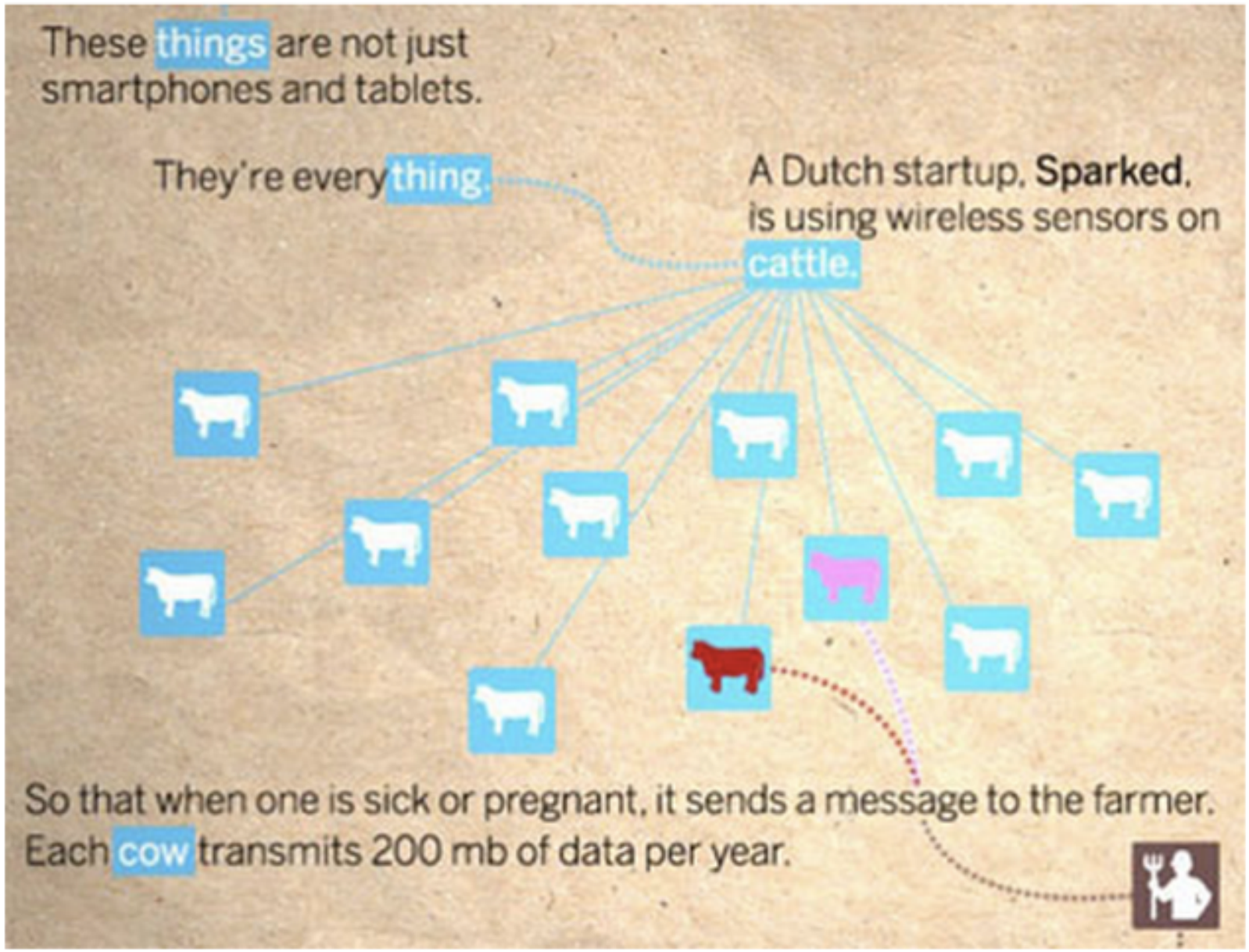


Figure 1: The possibilities offered by wireless M2M are limitless. Cisco's Internet of Things graphic describes Dutch start-up Sparked creating an intelligent M2M network to monitor dairy cows (Courtesy of Cisco).

[http://www.digikey.com/us/en/techzone/wireless/resources/articles/modular-choices-simplify-and-future-proof.html]

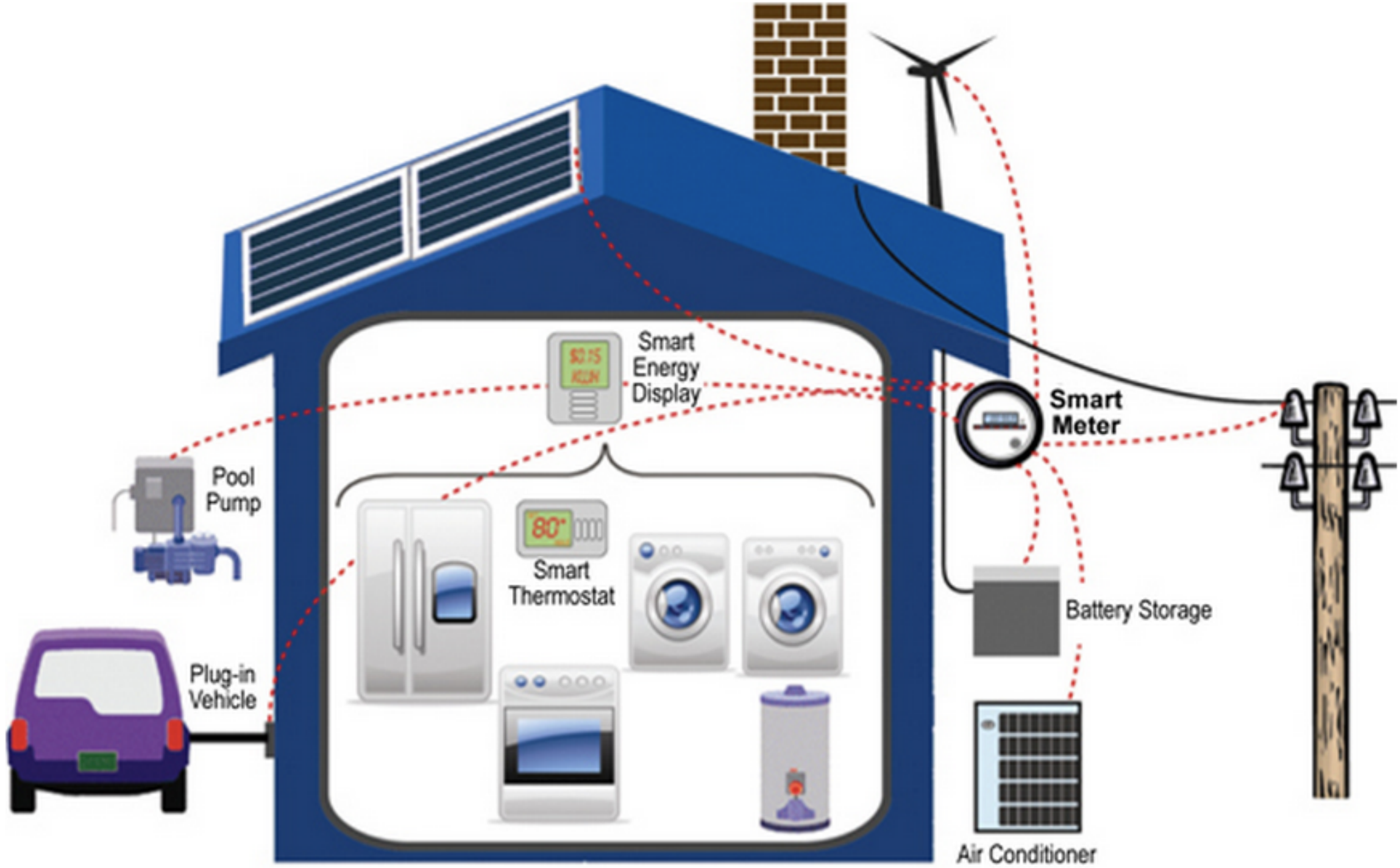


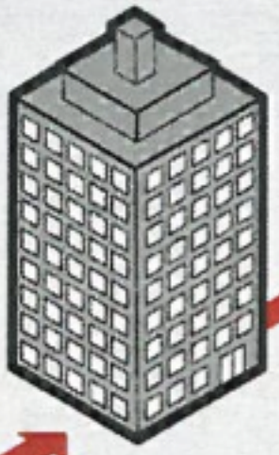
Figure 2: ZigBee and Wi-Fi enable the Smart Home where energy loads are controlled and utility rates balanced via Smart Meter communication (Courtesy of Microchip).

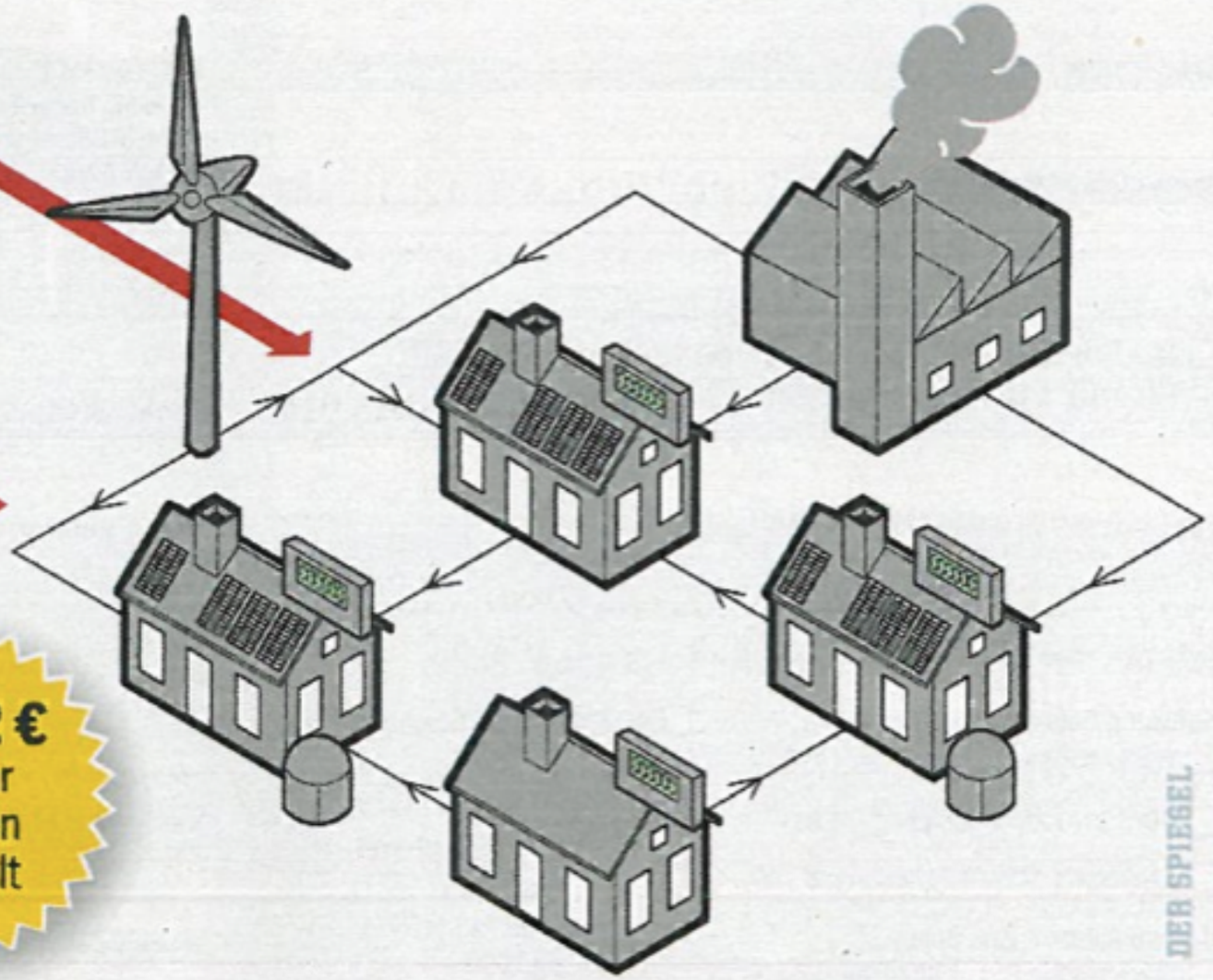
[http://www.digikey.com/us/en/techzone/wireless/resources/articles/modular-choices-simplify-and-future-proof.html]

Ferngesteuerter Stromkunde Die Idee eines intelligenten Stromnetzes

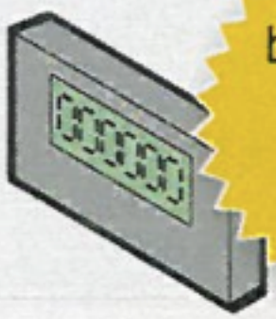
Netzbetreiber
steuert ständig das Stromangebot. Bei zu hohem Verbrauch schaltet er über den Smart Meter gezielt Geräte ab.

Smart Grid
Netzwerk, das alle Akteure des Energiemarkts miteinander verbinden soll.





Smart Meter
Intelligenter Stromzähler, der in jedem Haushalt installiert werden soll; übermittelt Verbrauchsdaten an den Energieversorger.



bis zu **72 €** pro Jahr für jeden Haushalt

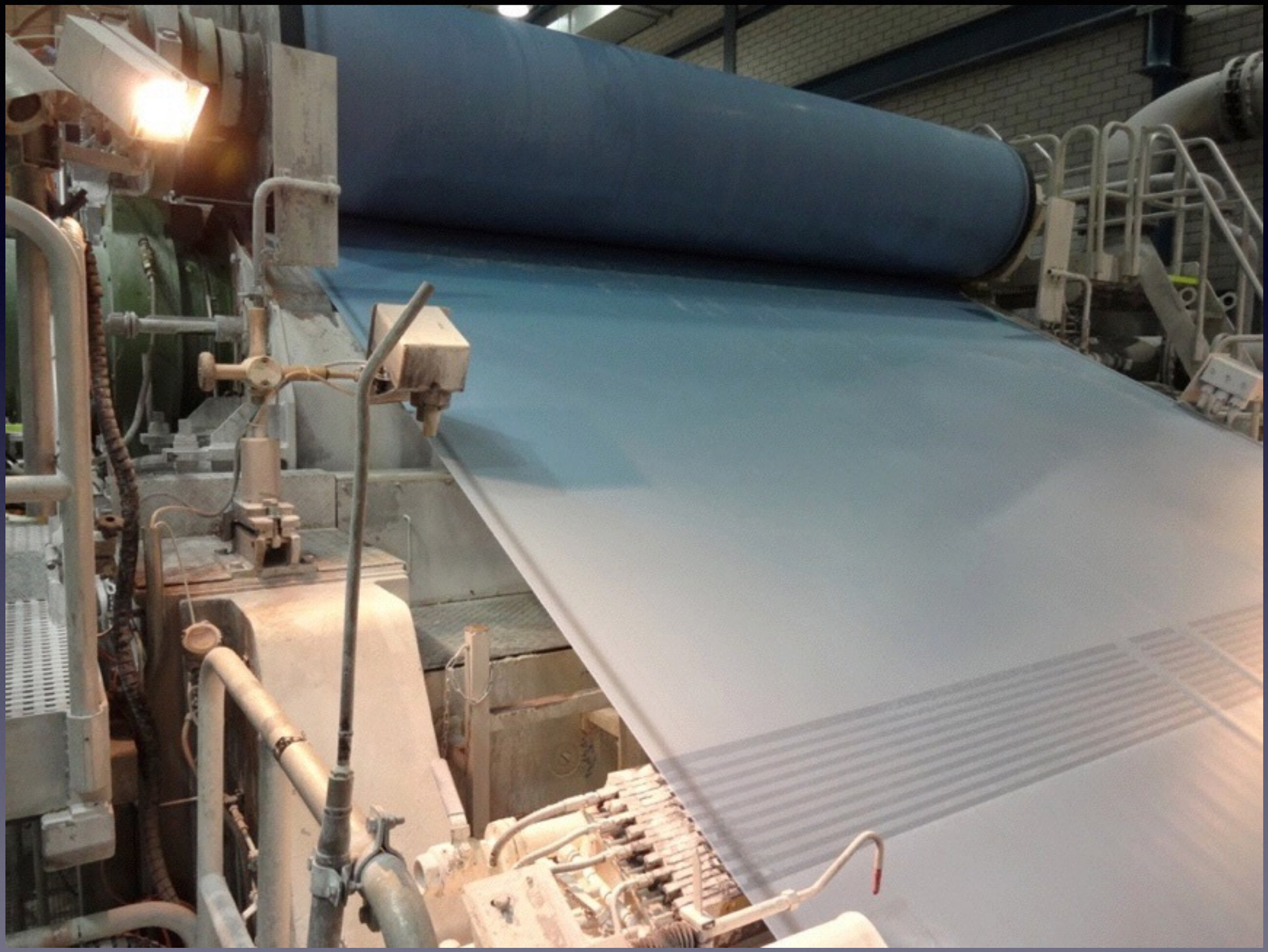
DER SPIEGEL

Figur *d and utility*

Sensornetze: Warum jetzt ?

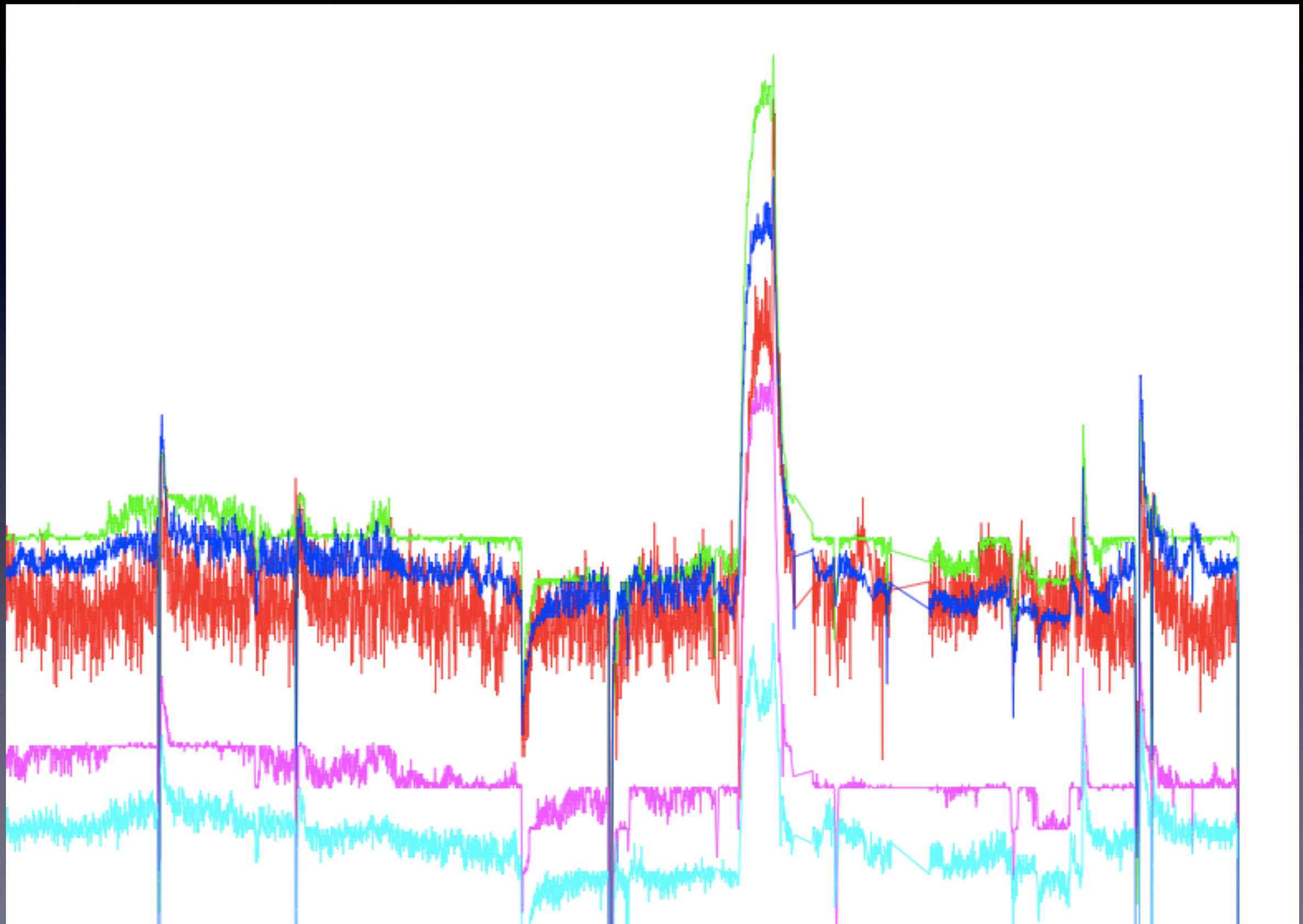
- Miniaturisierung
- Drahtlose Übertragung
- Bessere Batterien
- Sinkende Kosten

Industrial Internet konkret



Industrial Internet konkret

Industrial Internet konkret



Sensornetze:

Smart Bridges

Adding sensor networks to infrastructure will make them cyberphysical systems

By Steven Cherry

Posted 7 Aug 2013 | 15:32 GMT

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http://spectrum.ieee.org/podcast/at-work/test-and-measurement/smart-bridges

Sensornetze:

Montag, 07.03.2016 – 11:24 Uhr

Drucken | Merken Feedback | Nutzungsrechte

Marode Fernstraßen: Hier zerbröseln Deutschlands Brücken

Von Stefan Schultz und Patrick Stotz

DPA

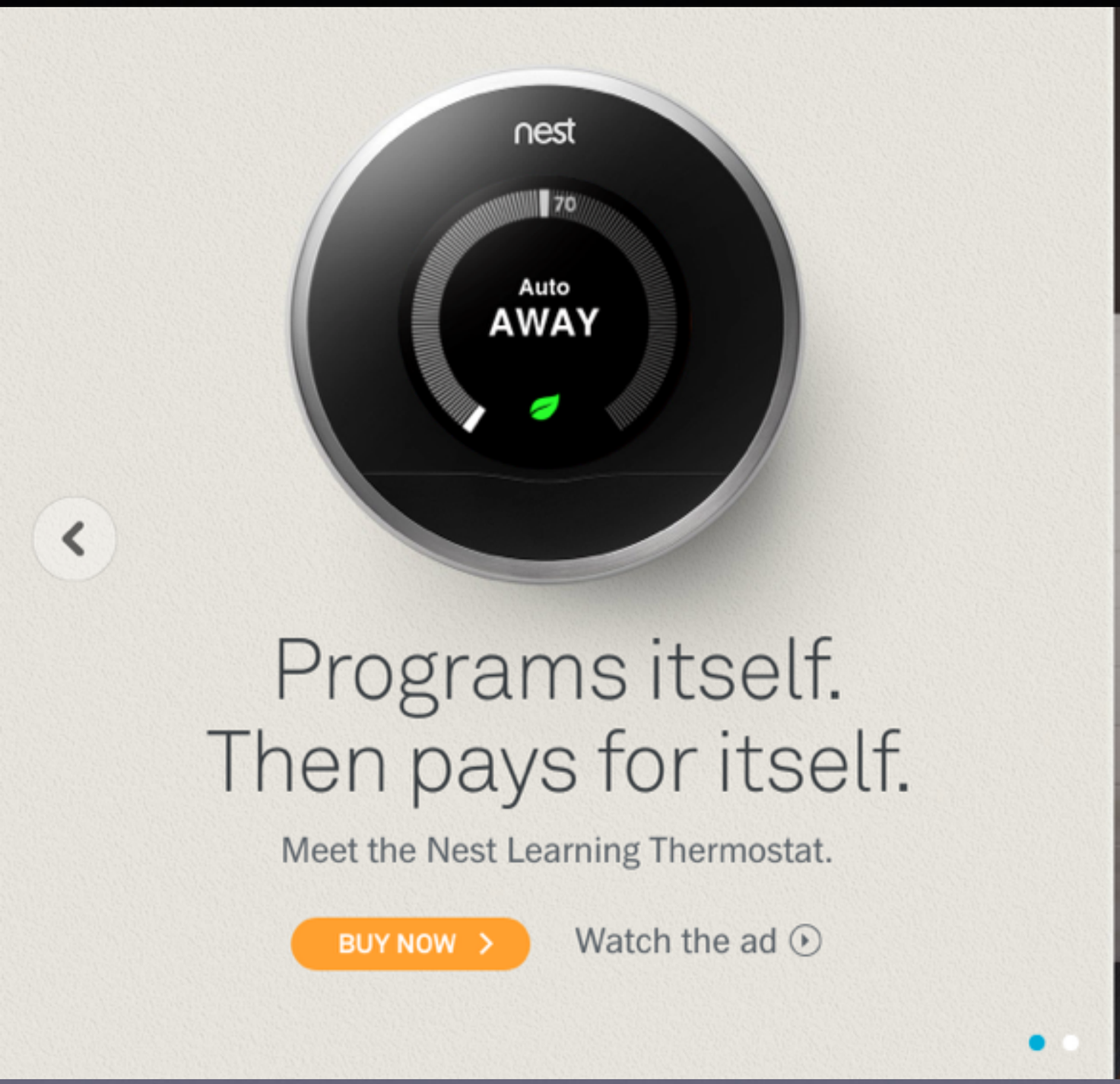
Schiersteiner Autobahnbrücke (Archivbild)

Der Verfall deutscher Brücken ist bedenklich. Millionen Quadratmeter müssen dringend repariert werden. Unsere interaktive Karte zeigt, wie marode die Bauten auf Ihrer Fahrstrecke sind.

http://spectrum.ieee.org/podcast/at-work/test-and-measurement/smart-bridges

was geht mich das an ?

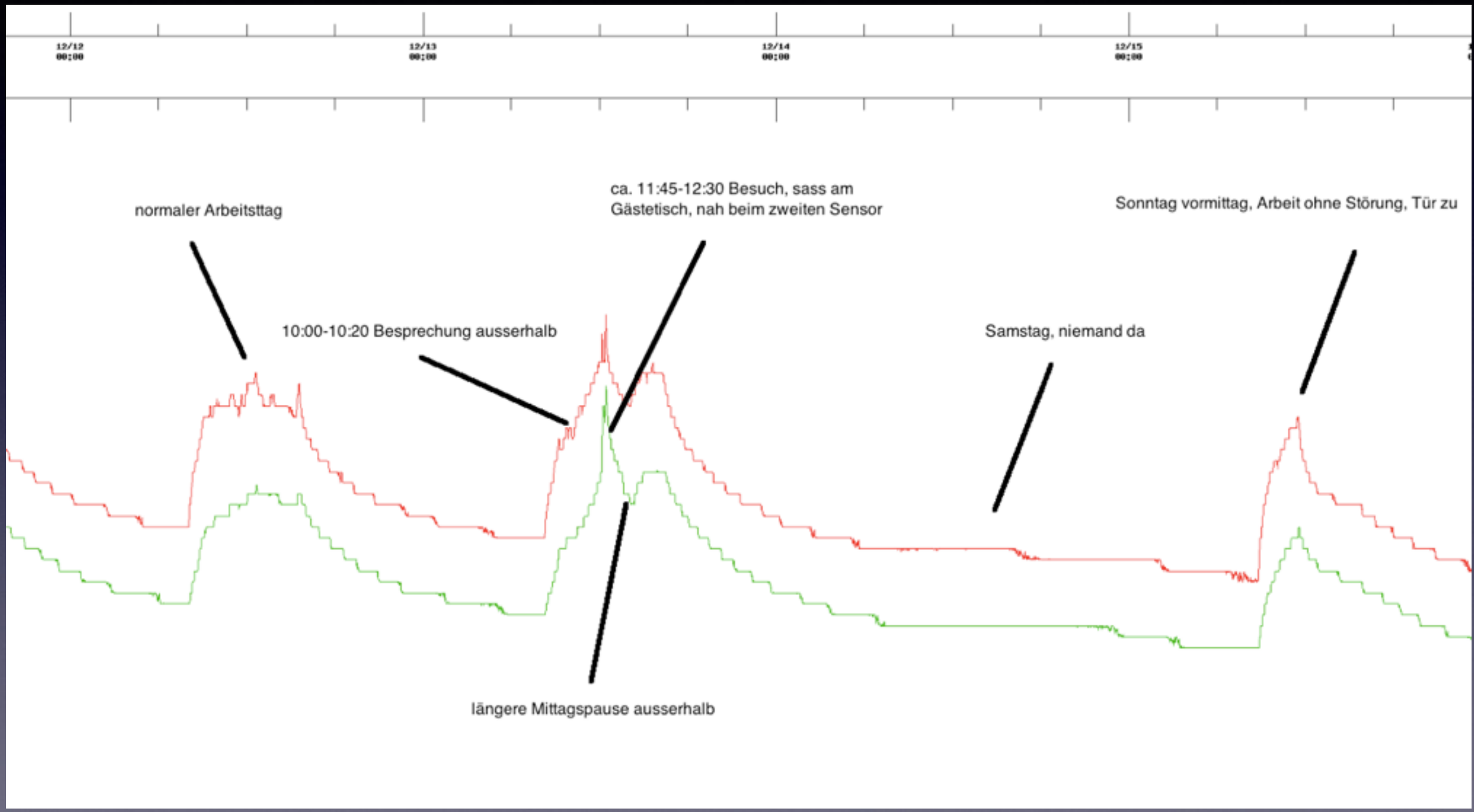
Beispiel: Nest



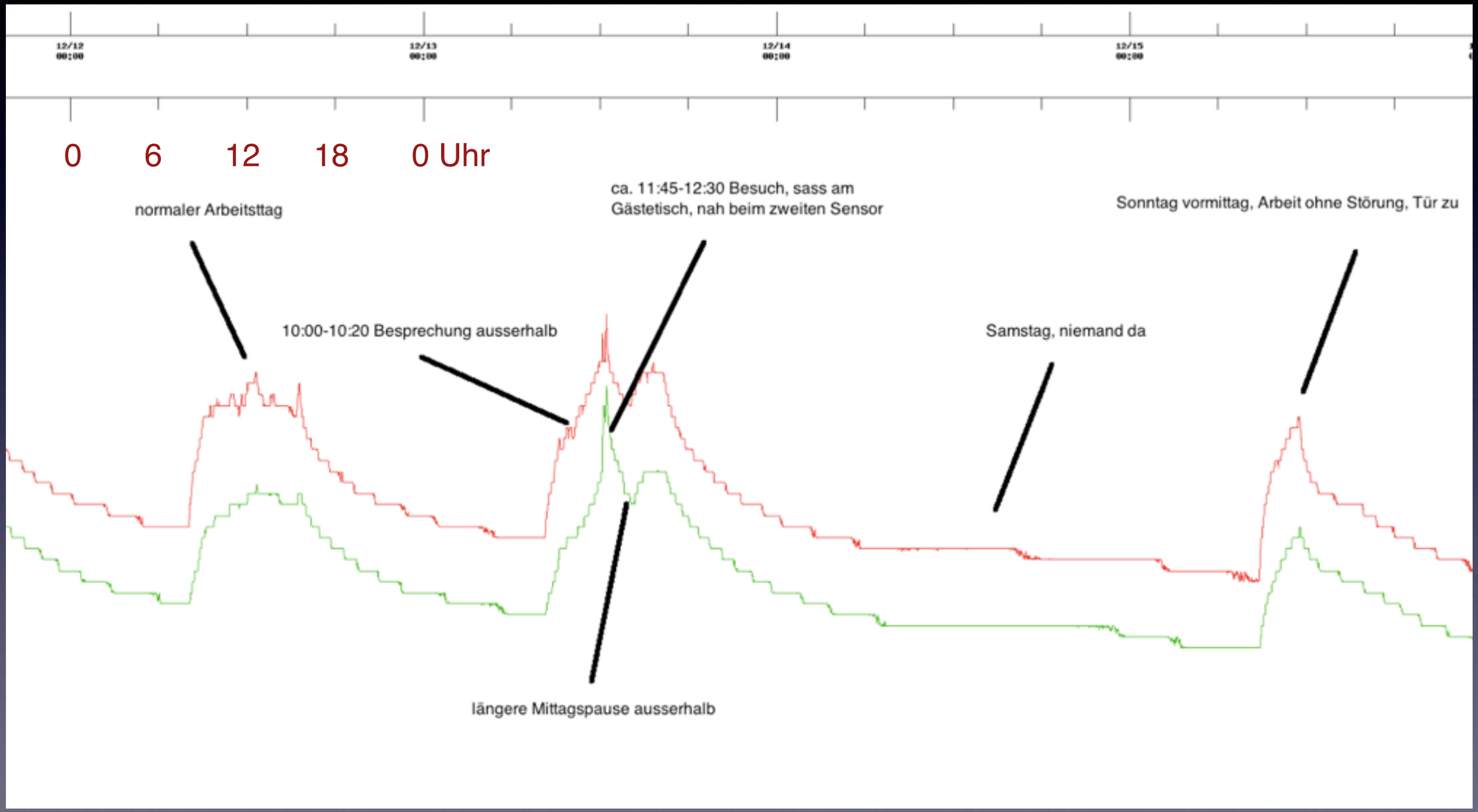
Beispiel: Nest

2014 für > 3 Milliarden US$ von google aufgekauft

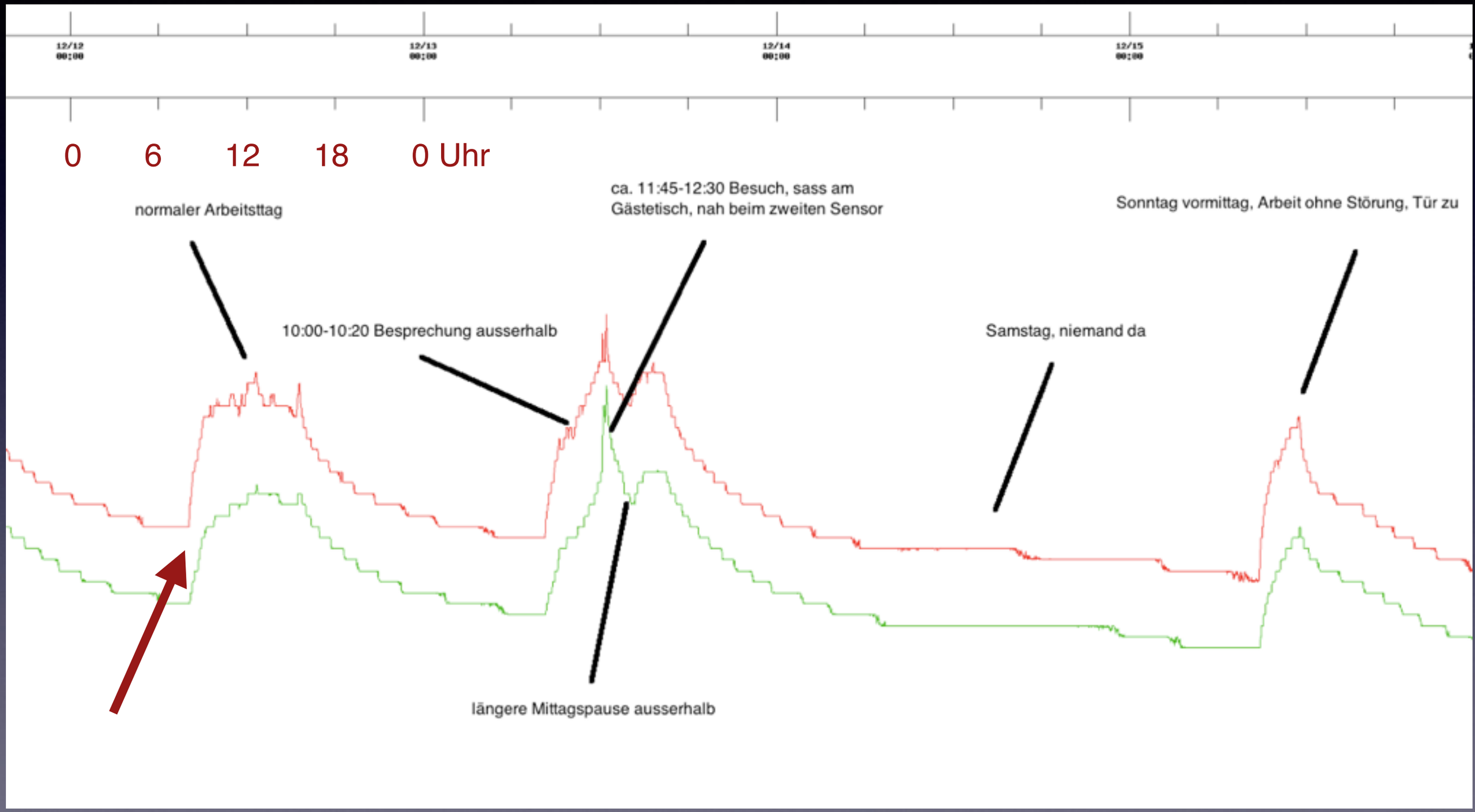
was kann man damit anfangen ?



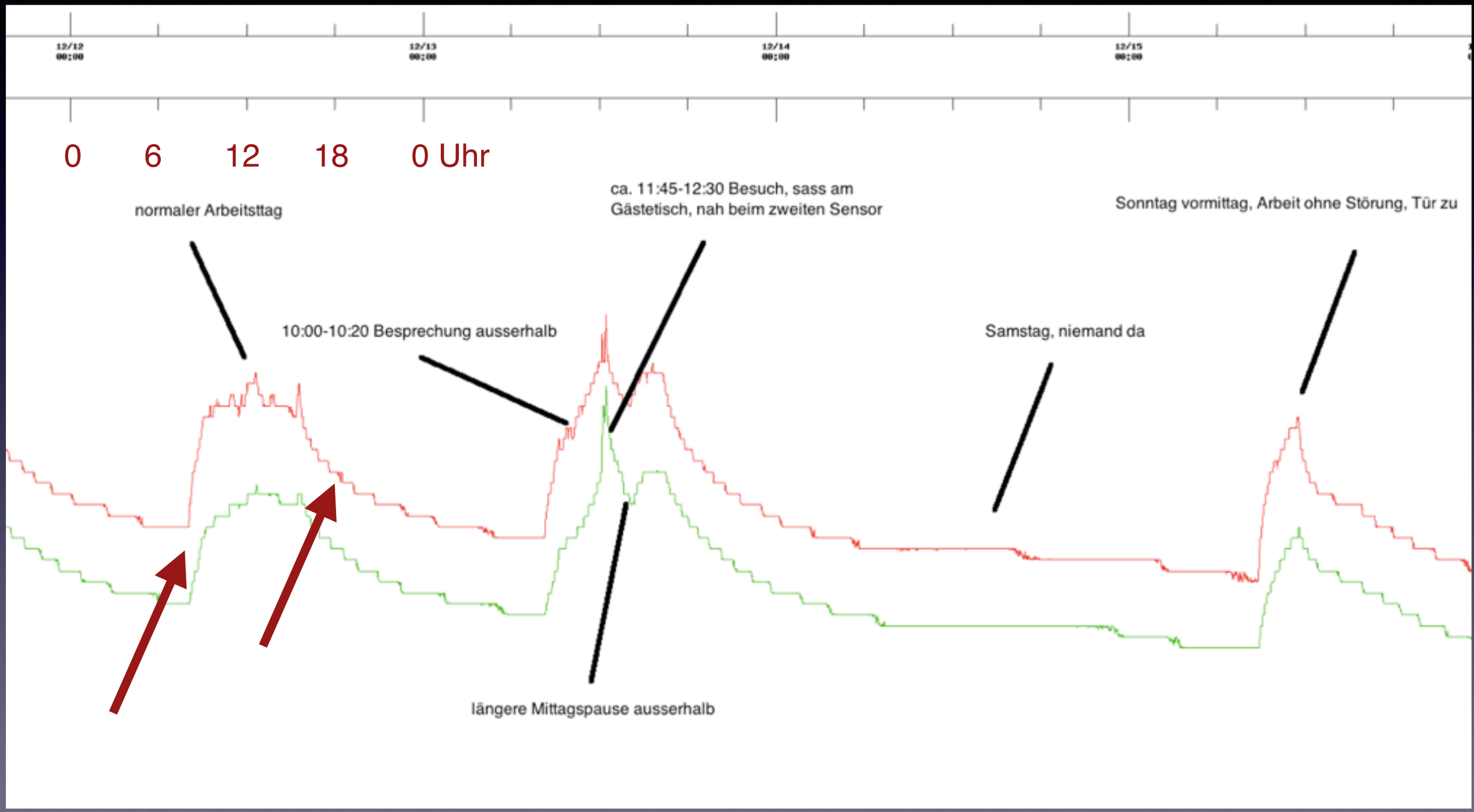
was kann man damit anfangen ?



was kann man damit anfangen ?



was kann man damit anfangen ?



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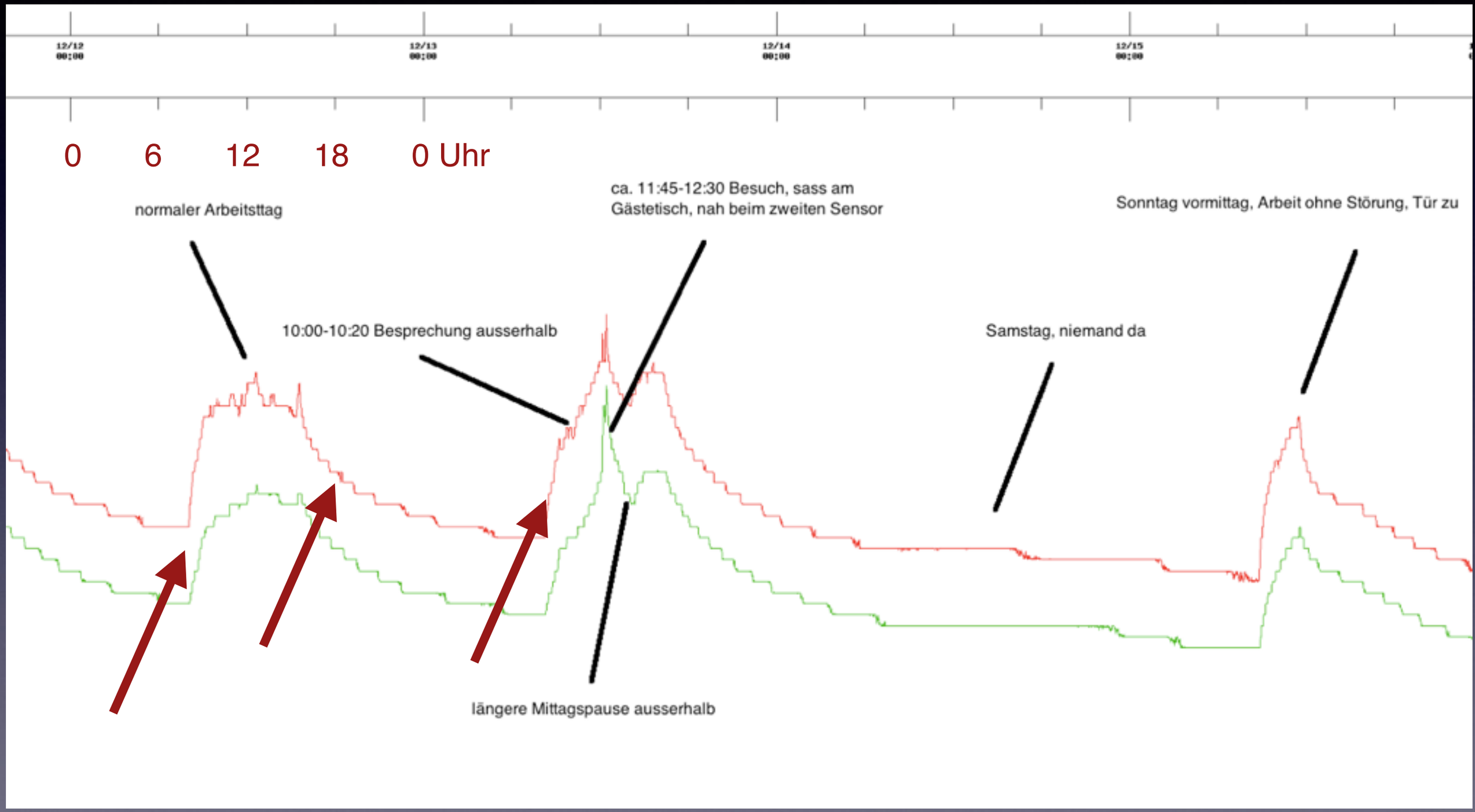
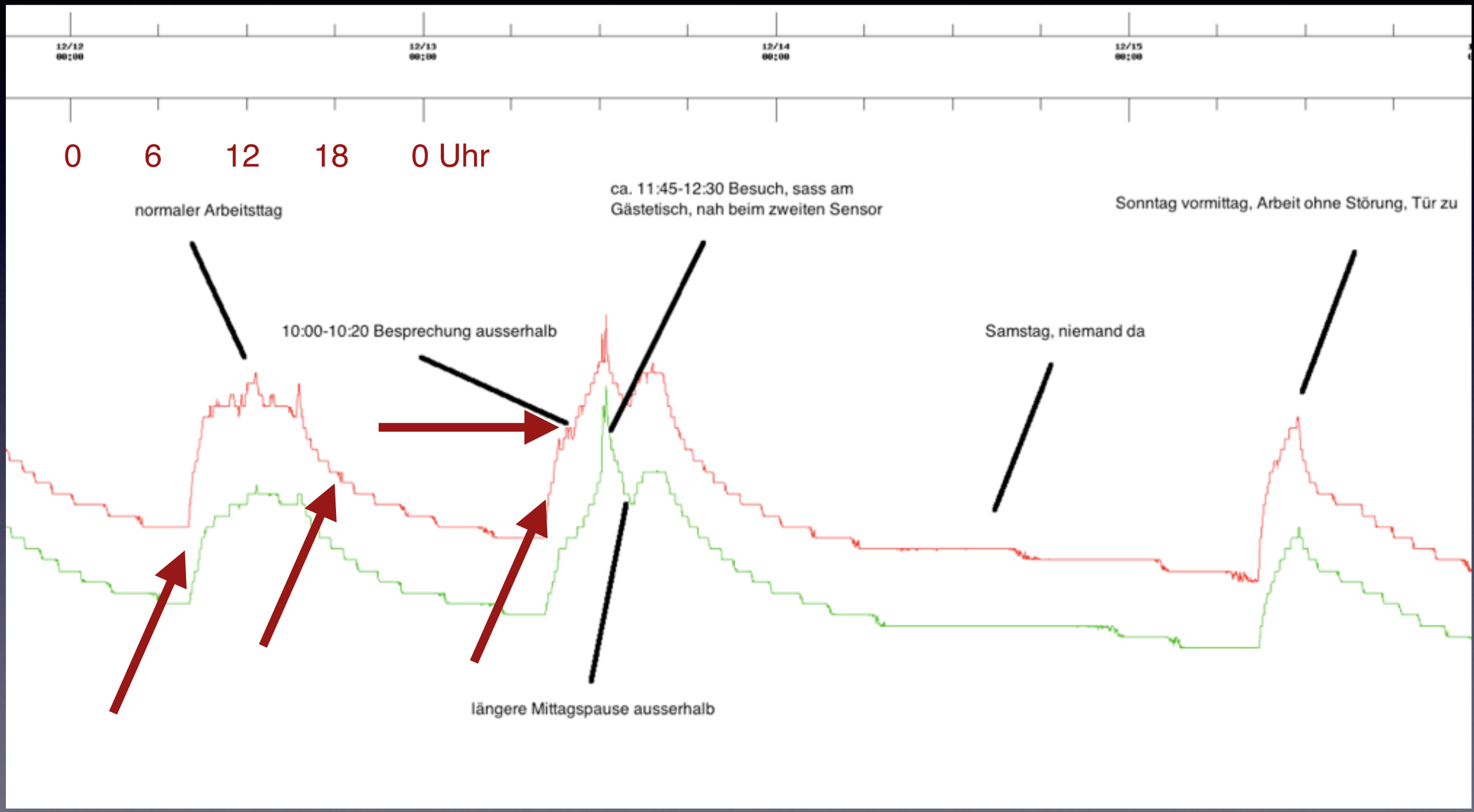
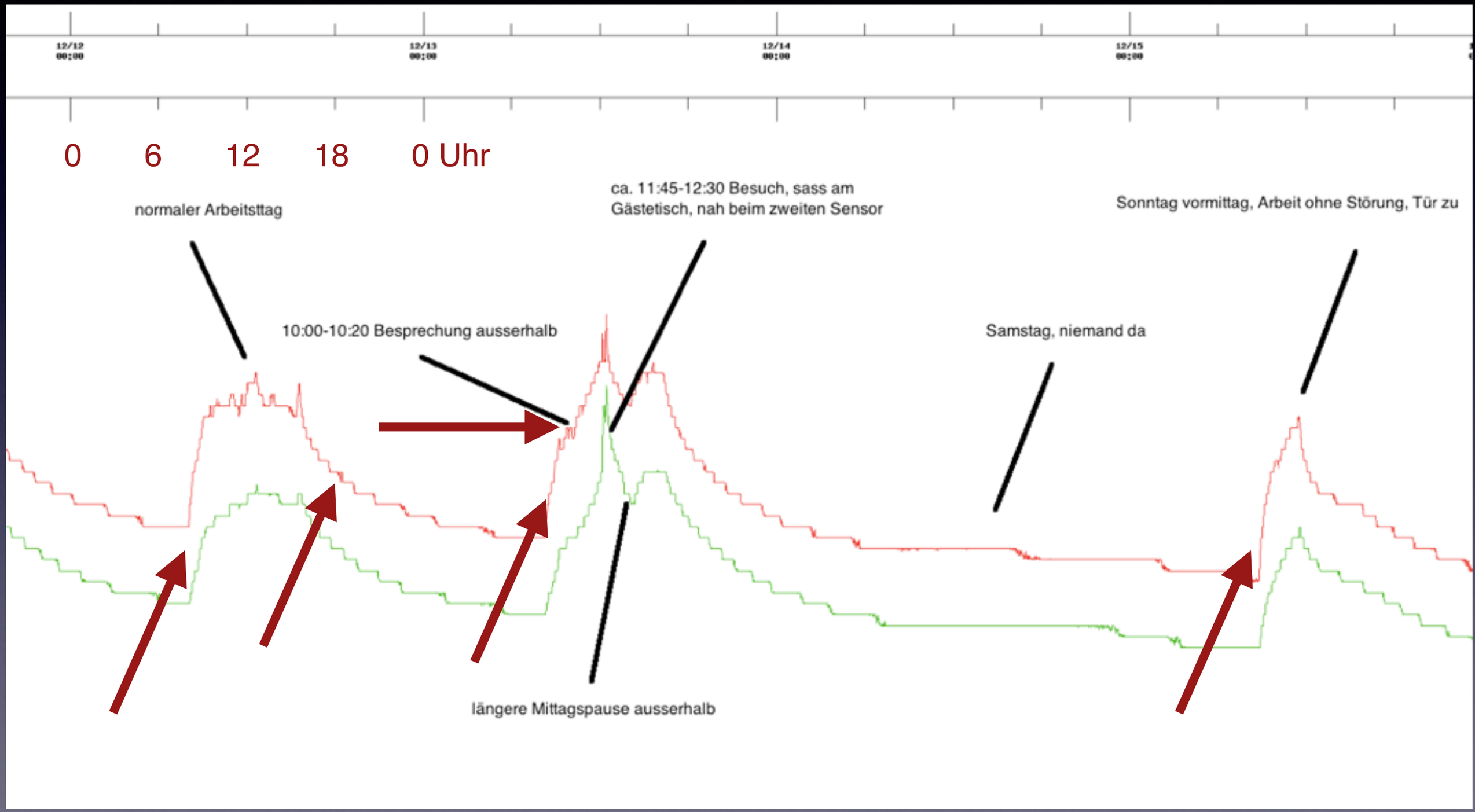


was kann man damit anfangen ?

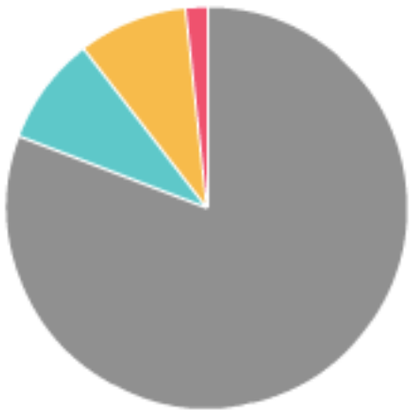


was kann man damit anfangen ?



Verbrannte Kalorien | Schritte | Stockwerke | Aktive Zeit

Analyse der heutigen Aktivität (ohne Schlaf)



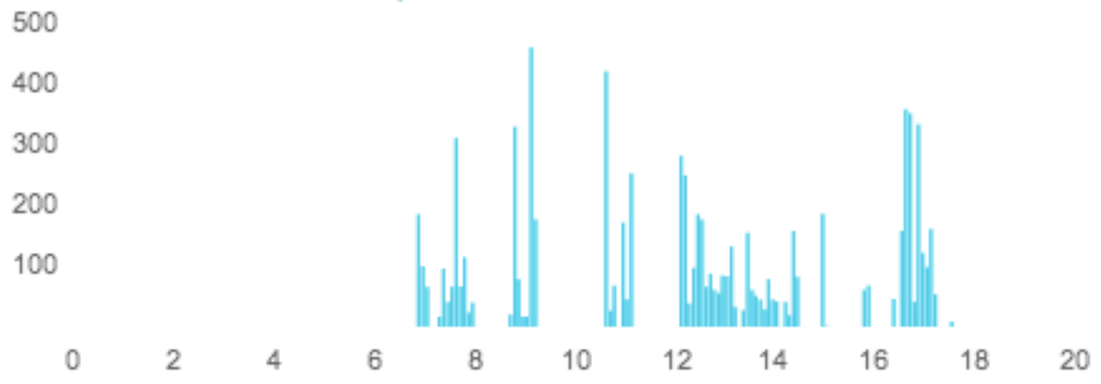
Im Sitzen
19Std 24Min
(80,8%)

Relativ aktiv
2Std 7Min
(8,8%)

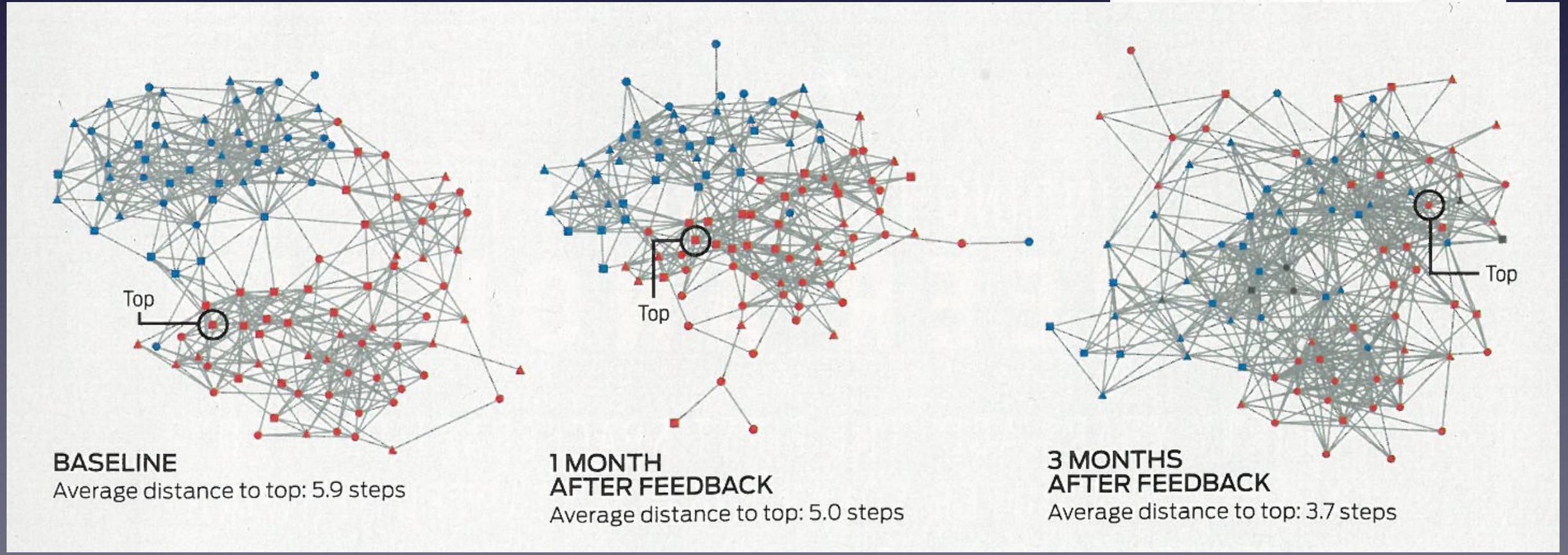
Leicht aktiv
2Std 5Min
(8,7%)

Sehr aktiv
24Min
(1,7%)

Verbrannte Kalorien | Schritte | Stockwerke | Aktive Zeit



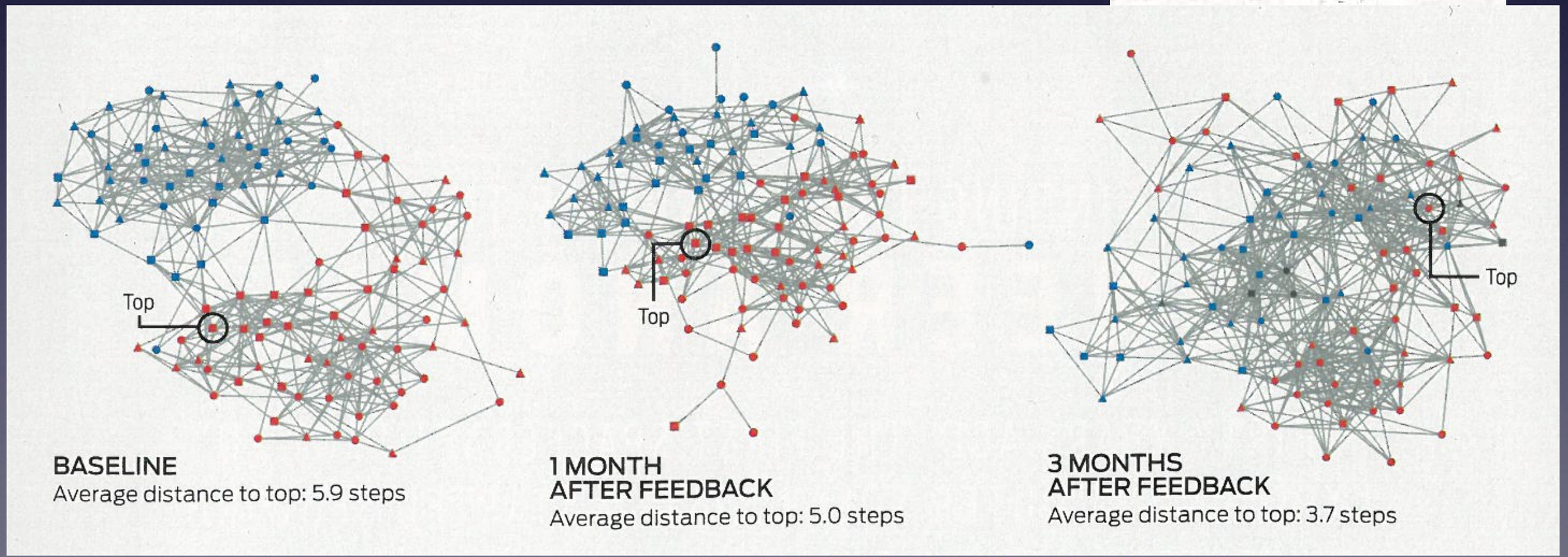
Engineering happiness



Kazuo Yano et al, Sensing Happiness, IEEE Spectrum, Dezember 2012

Engineering happiness

Engineering health:
Monitoring von Klinikpersonal bei Desinfektion (30.000 Tote jährlich wegen Klinikinfektionen allein in D)



Kazuo Yano et al, Sensing Happiness, IEEE Spectrum, Dezember 2012

Wohin führt das ?

Second Machine Age

Erik Brynjolfsson:

As you digitize and network things, you're able to take processes, codify them, and then replicate them. That means you often get winner-take-most markets, with huge increases in efficiency and less need for labor input—or capital input, for that matter.

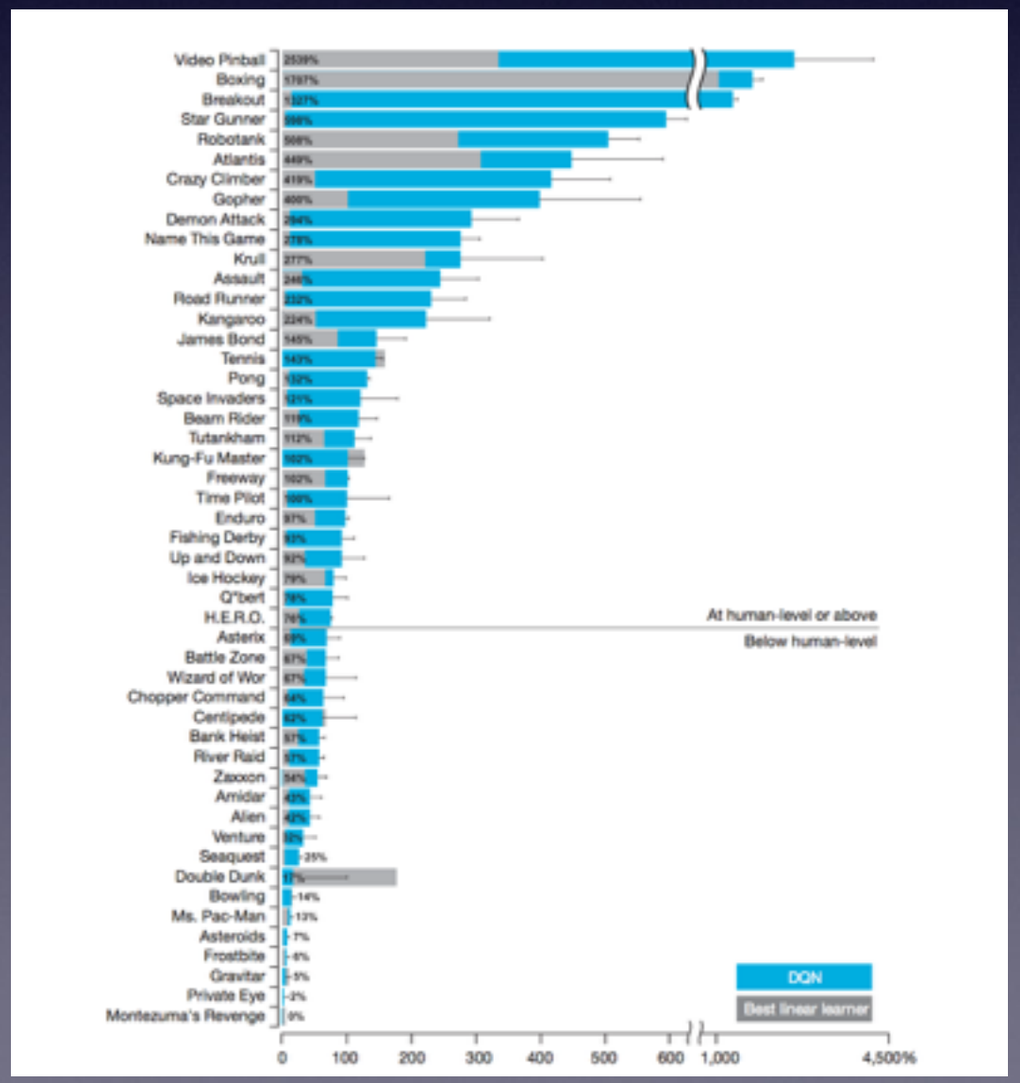
Deep learning

Deep learning

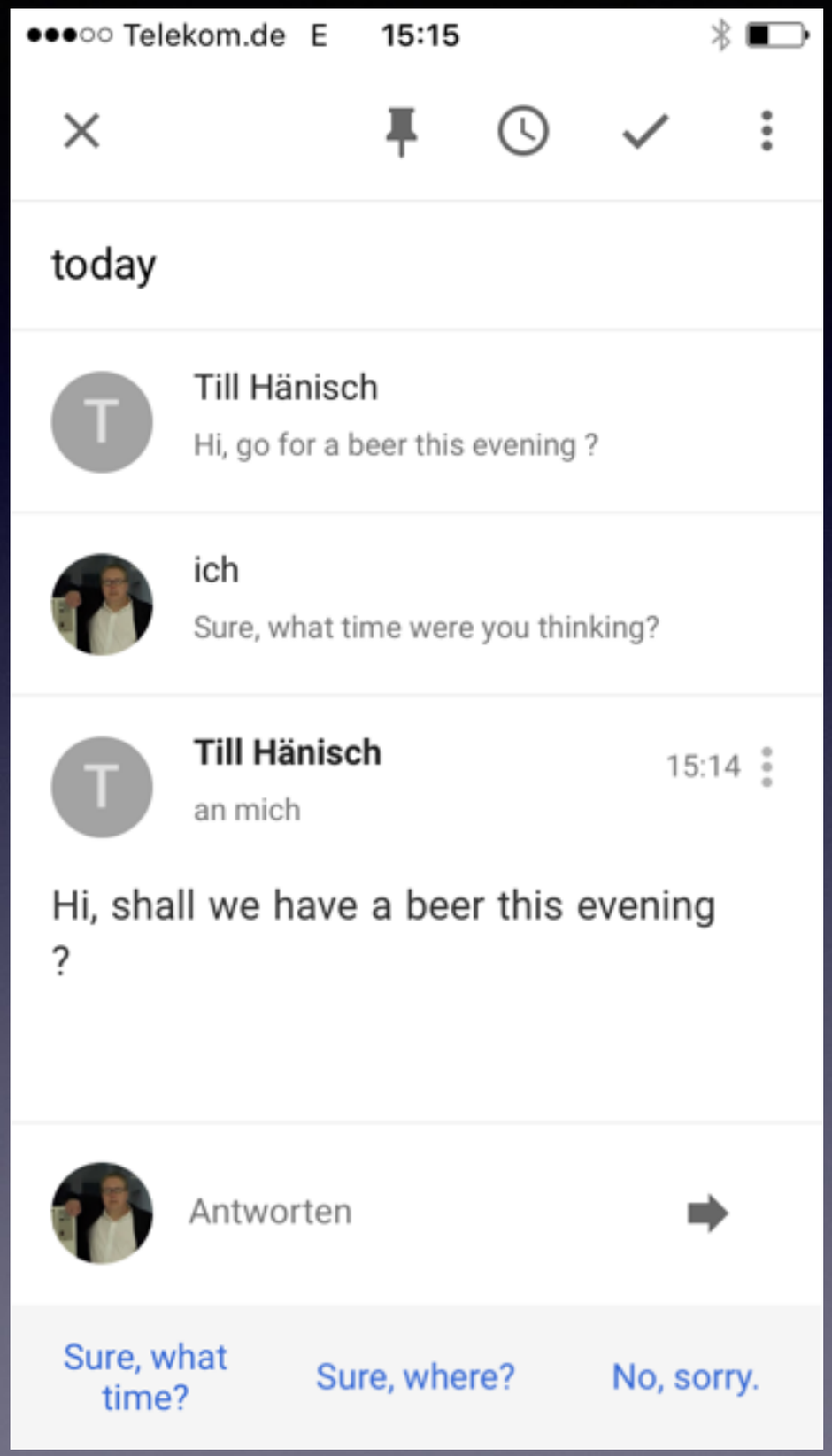
Deep learning

Nature Vol. 518, No. 7540

Neuronales Netzwerk lernt ohne Anleitung, klassische Computer Spiele besser zu spielen als ein Mensch

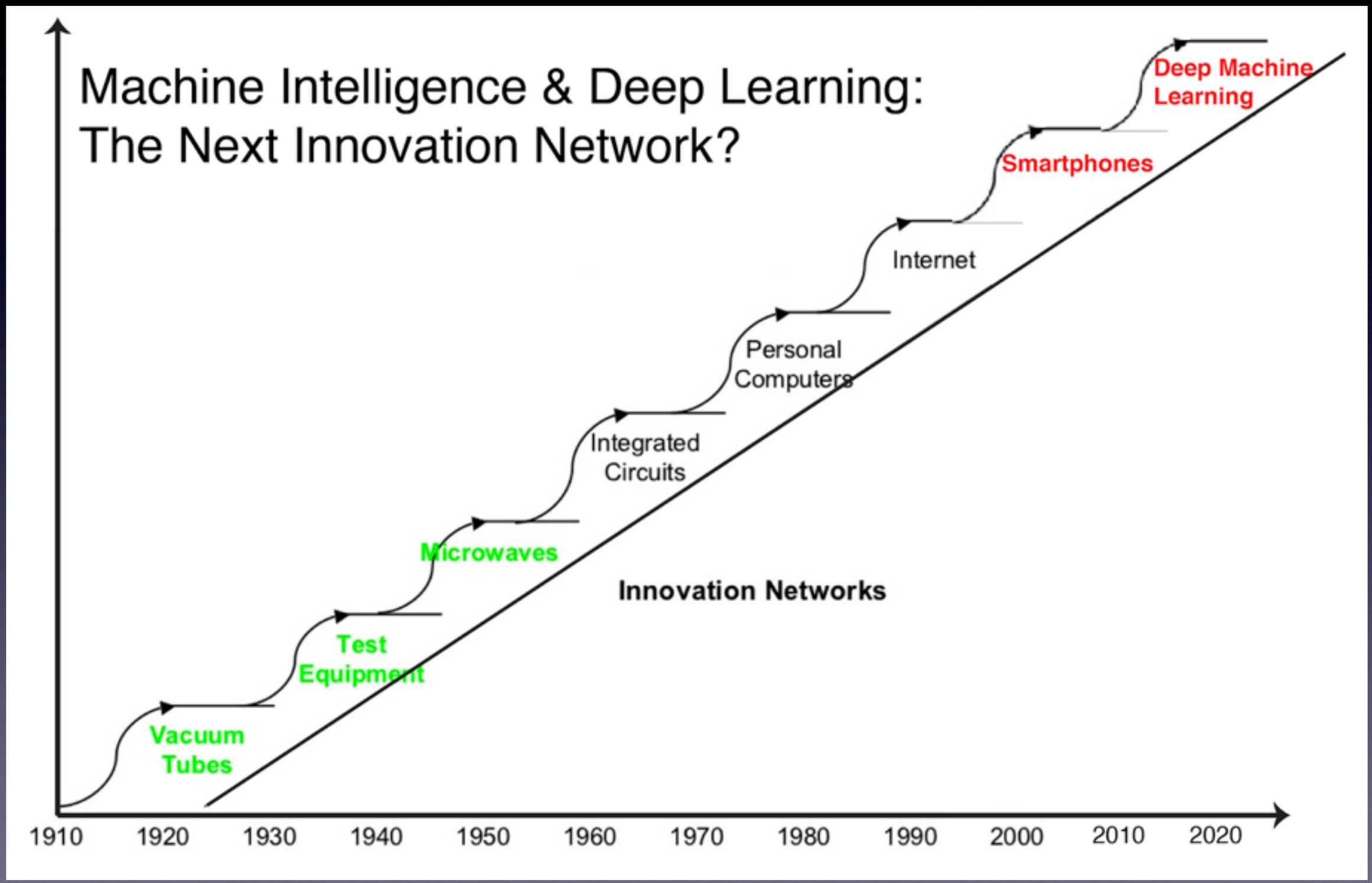


Smart Reply



gmail Inbox kann einfache mails beantworten

Entwicklung



http://www.computervisionblog.com/2015/11/the-deep-learning-gold-rush-of-2015.html

Moore's Law and the „second half" of the chessboard

Second Half of the Chessboard

Second half of the chessboard [edit]

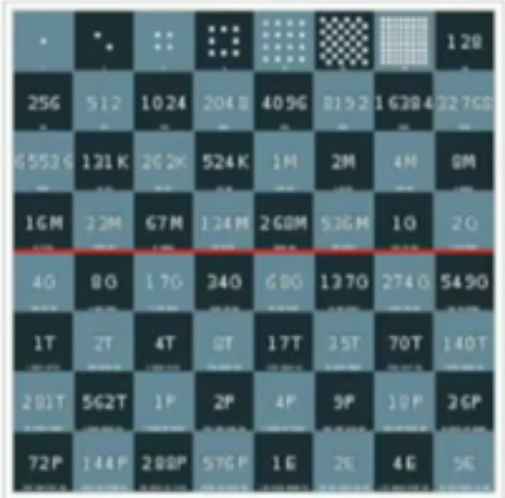
In technology strategy, the **second half of the chessboard** is a phrase, coined by Ray Kurzweil,[3] in reference to the point where an exponentially growing factor begins to have a significant economic impact on an organization's overall business strategy.

While the number of grains on the first half of the chessboard is large, the amount on the **second half** is vastly (2^{32} > 4 billion times) larger.

The number of grains of rice on the **first half** of the chessboard is 1 + 2 + 4 + 8... + 2,147,483,648, for a total of 4,294,967,295 (2^{32} – 1) grains of rice, or about 100,000 kg of rice (assuming 25 mg as the mass of one grain of rice).[4] India's annual rice output is about 1,200,000 times that amount.[5]

The number of grains of rice on the **second half** of the chessboard is $2^{32} + 2^{33} + 2^{34} ... + 2^{63}$, for a total of $2^{64} – 2^{32}$ grains of rice (the square of the number of grains on the first half of the board plus itself). Indeed, as each square contains one grain more than the total of all the squares before it, the first square of the second half alone contains more grains than the entire first half.

On the 64th square of the chessboard alone there would be 2^{63} = 9,223,372,036,854,775,808 grains of rice, or more than two billion times as much as on the first half of the chessboard.



An illustration of Ray Kurzweil's second half of the chessboard priciple

We enter second half of the technology chessboard?

$$1958 + 32 * 1.5 = 2006$$

Andrew McAfee, https://www.youtube.com/watch?v=B69ENAa7RKg