

Stone Age of the Internet of Things

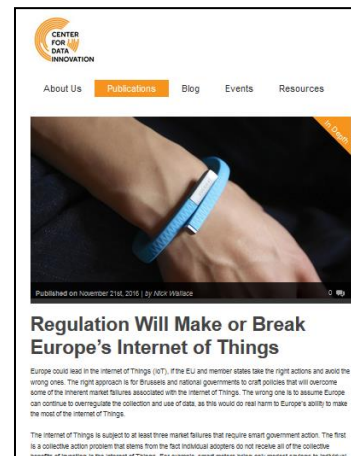
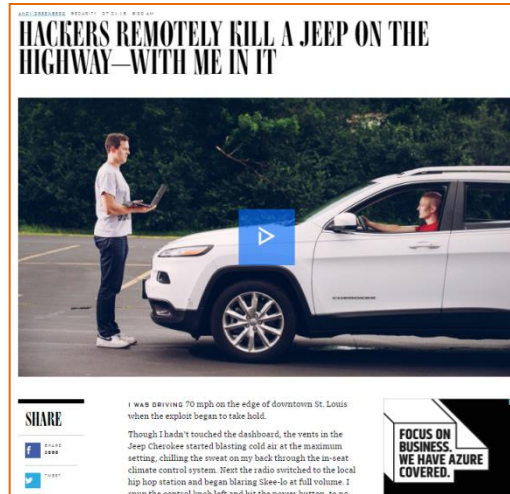
Dr. Francine Berman

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“Governance” in the Stone Age

- Social behavior and governance nascent, rudimentary, tribal
- Insufficient mechanisms for ensuring individual rights, accountability, the public good, etc.
- Development of tools and technologies progress with advancements in social and cultural structures



Articles: <https://www.wired.com/2015/07/hackers-remotely-kill-jeep-highway><http://www.computerworld.com/article/3137472/internet-of-things/it-s-time-to-regulate-baby-monitors.html>;
<https://www.theguardian.com/science/alexs-adventures-in-numberland/2014/sep/08/when-fridges-attack-the-new-ethics-of-the-internet-of-things> ; <https://www.datainnovation.org/2016/11/regulation-will-make-or-break-europes-internet-of-things/>

IoT Vision: Empower People Through Technology and Technology Through Intelligence



Adaptive Systems

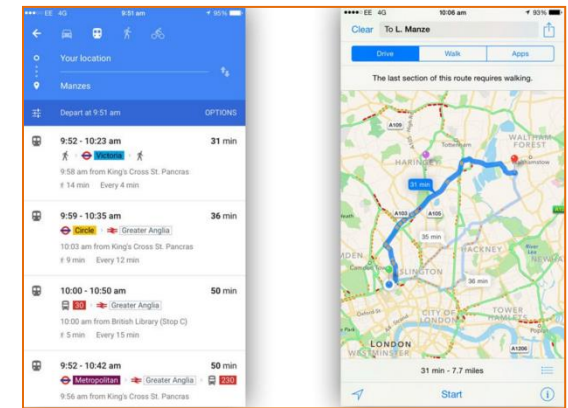


Customization / Personalization



Smart Technologies

Monitoring



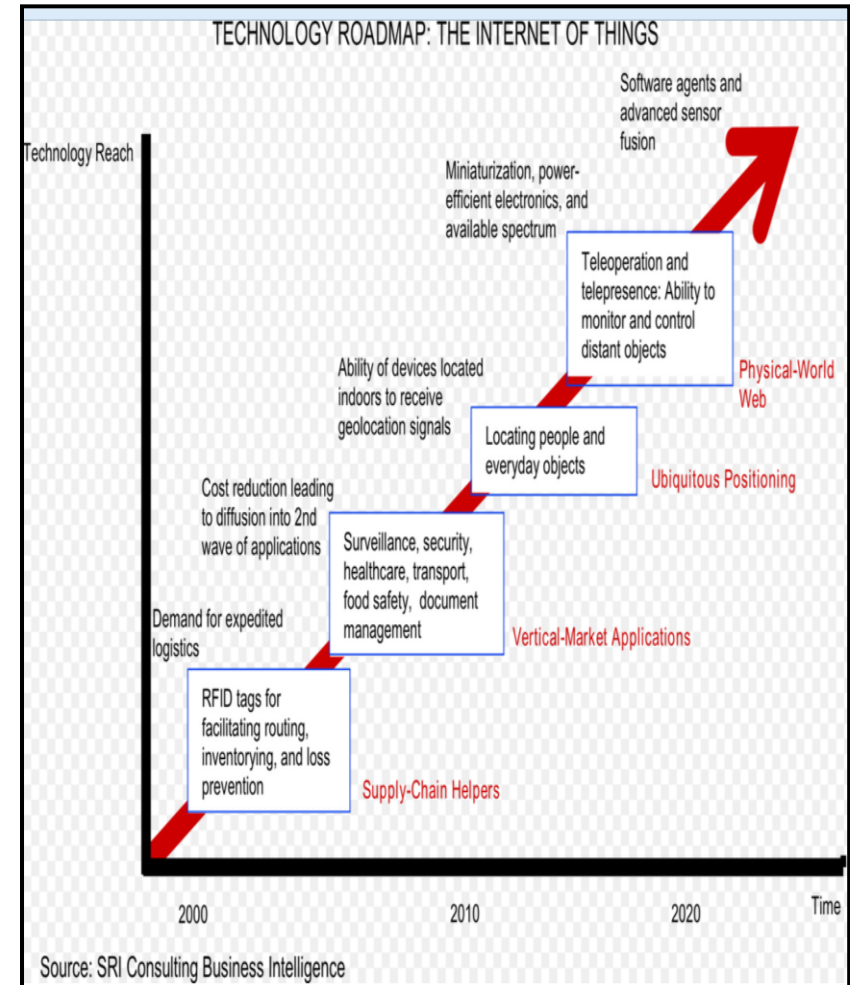
Optimization

Images and articles: <http://postscapes.com/internet-of-things-examples>; <http://www.cortexdynamo.com/en/buy-robots-and-droids-store/products-by-companies-and-brands/irobot/home-cleaning-and-maintenance/roomba-automated-vacuum-cleaner>;
http://www.nytimes.com/2016/12/05/business/fashions-future-printed-to-order.html?smprod=nytcore-iphone&smid=nytcore-iphone-share&_r=0

IoT Governance Structure will need to cover a lot of ground

- IoT will increasingly blend cyber systems, the physical / natural environment, and humans / biological systems.
 - Social rules will be needed that apply to all entities
- Governance structures will include policy, regulation, community practice
- **Social structures need to evolve *with* technology but not limit innovation; the time for national-scale discussion and the initial development of social and governance structures for the IoT is *NOW***

IoT Technology Roadmap What is the IoT Social Roadmap?



Pre-IoT: Asimov's Social Rules for Robots

Over 50 years ago, Isaac Asimov introduced laws of robotics:

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



Image from <http://hereandnow.wbur.org/2014/10/07/artificial-intelligence-strickland>, iRobot, 20th Century Fox

What rules of behavior should be in place for heterogeneous and hybrid community of entities (devices, systems, people, etc.) that will form the IoT?

What Would Governance Mean for the IoT?

Adapting the **World Governance Index** (based on the UN Millennium Declaration), critical themes for governance span key areas. In all instances, **coordination of technical and social approaches needed**

WGI Theme		IoT Areas Where Governance Structures Needed
Peace and Security	→	IoT Security, Trust, Safety, Crime
Democracy and Rule of Law	→	Legal framework for determining appropriate and inappropriate behavior
Human Rights and Participation	→	IoT “Bill of Rights”? – Right to Privacy, Right to control information, Right to opt out, etc. Framework for promoting “equality” and penalizing “discrimination”
Sustainable development	→	Architectures, standards, policy, infrastructure, etc. to promote evolutionary and sustainable growth
Human development	→	Digital ethics, use of technology to advance / actualize its participants and contribute to well-being

Responsibility and Accountability in the IoT

Increasing autonomy brings questions of responsibility, accountability, privacy:

- Who is accountable when your self-driving car hits someone?
- What policy / regulation is needed in a “car –net” environment where vehicles communicate with one another to make autonomous / group decisions?
- How should autonomous systems decide between multiple bad options?

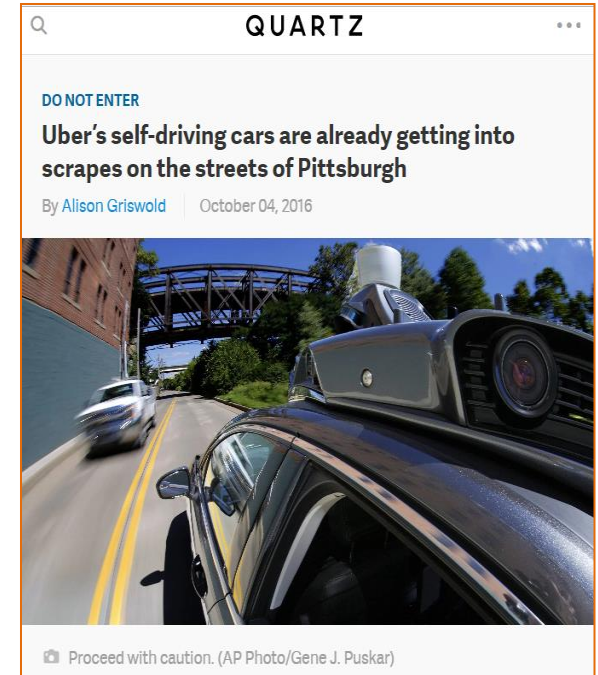
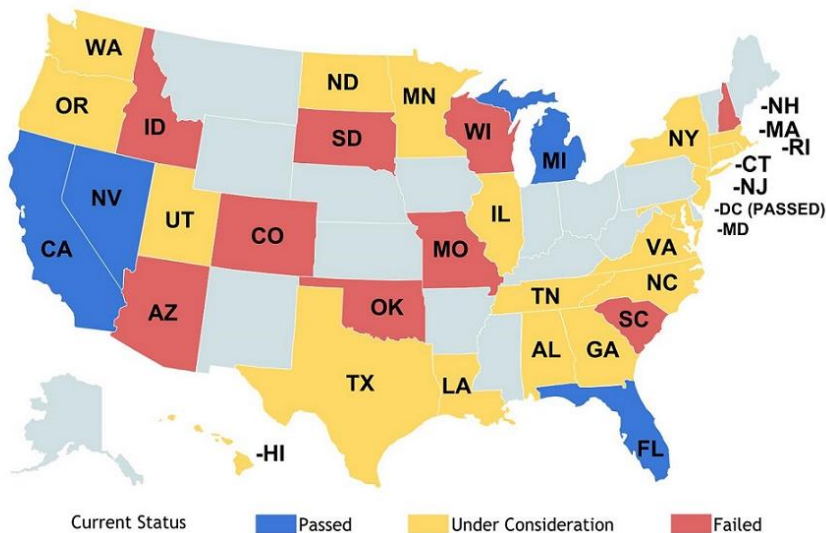


Image from <http://www.nbcnews.com/tech/innovation/can-i-kill-traffic-self-driving-cars-n217211>

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How will we effectively regulate autonomous systems to benefit individuals, organizations, and society?

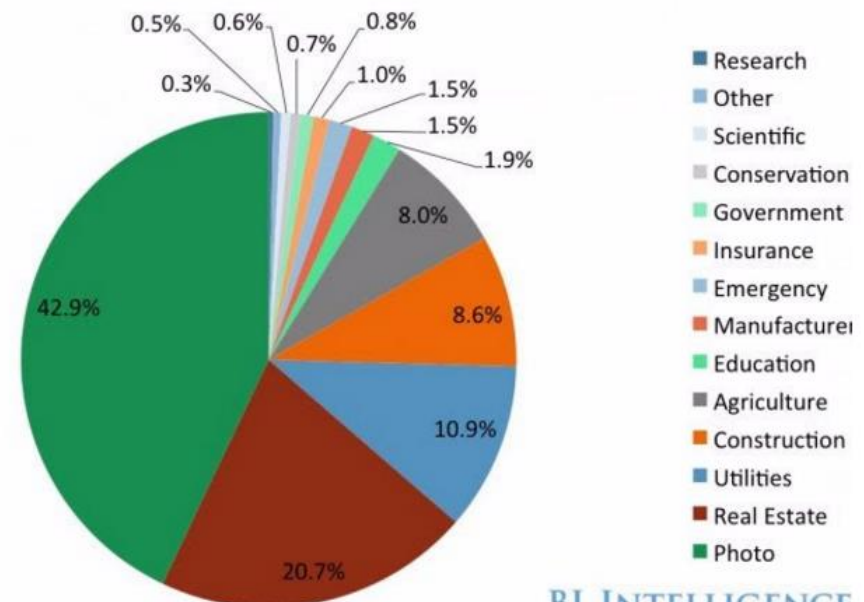
States with bills about self-driving vehicles



http://cyberlaw.stanford.edu/wiki/index.php/Automated_Driver_legislative_and_Regulatory_Action

Top Industries Using Drones

% Of Section 333 Exemptions Issued in US



Source: FAA, The Verge Drone Project, 2015

BI INTELLIGENCE

<http://www.roboticstomorrow.com/news/2016/04/06/ieee-standards-association-introduces-global-initiative-for-ethical-considerations-in-the-design-of-autonomous-systems/7917/>

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Openness and Privacy

- Who should control / access information about you?
What are your rights?
- When should individual privacy be more important than the public good?
 - How do we trade off transparency / public value of information with privacy / private value of information?

The screenshot shows the top portion of The New York Times website. At the top right is the logo 'The New York Times'. Below it is a navigation bar with search and menu options. A large advertisement for Samsung is featured, with the text 'SAMSUNG Give the gift of Galaxy'. Below the ad is a headline for an article: 'High-Tech Devices Keep Elderly Safe From Afar' by Elizabeth Olson, dated May 25, 2008. The article includes a photograph of an elderly woman in a red outfit standing in a living room. Below the photo is a caption: 'Helen Trust, 88, in her home in Mankato, Minn., where a monitoring system helps her live alone.' Below the article is a section titled 'TECH & SCIENCE ARE HACKERS SPYING ON YOUR BABY?' by Anthony Cuthbertson, dated 1/29/16 at 11:56 AM. This section includes a sub-header 'TECH & SCIENCE' and 'INTEREST OF THINGS' and 'CYBERSECURITY'.

This section shows a close-up of the article 'ARE HACKERS SPYING ON YOUR BABY?' from Newsweek. The article is dated 1/29/16 at 11:56 AM and is categorized under 'TECH & SCIENCE', 'INTEREST OF THINGS', and 'CYBERSECURITY'. The text begins with: 'Marc Gilbert was washing the dishes when he first heard a stranger's voice in his daughter's bedroom. As he and his wife approached the room, he heard the stranger telling his two-year-old to "wake up you little slut." But there was no one there. Instead, the voice was coming from the camera-equipped baby monitor overlooking the infant's crib.' The article continues: 'Gilbert's baby monitor was hacked in August 2013 and since then reports of unwanted intrusions through Internet-connected devices have proliferated. This month, an online search engine called Shodan, originally set up in 2000 to provide feeds from web-connected CCTV cameras and webcams, made it inadvertently possible for people to view sleeping children through vulnerable smart baby monitors.' It then states: 'In response to the issue, a U.S. consumer watchdog launched an investigation this week into four of the baby monitor companies that it believes are compromising the safety of children.' Below the text is a photograph of a baby in a crib. At the bottom of the page, there is a promotional banner: 'Try Newsweek for only \$1.25 per week'. The footer of the page includes the text 'An eight-month-old baby in his crib, February 18, 2011 in Decatur, Illinois, consumer watchdogs and security experts tell Newsweek more needs to be done to protect against disturbing incidents involving hacked baby monitors, some of which have a sexual aspect to them.' and the 'UNITED STATES' logo.

Rights and Participation

- What are your rights in the IoT?
 - Right to privacy?
 - Right to access information about you?
 - Right to prevail over the behavior / intention of autonomous systems? (a la Asimov)

Home / News /

Europe vs. Facebook: Austrian activist wins another legal battle over data protection

Published time: 26 May, 2016 21:07 [Get short URL](#)



© Dado Ruvic / Reuters

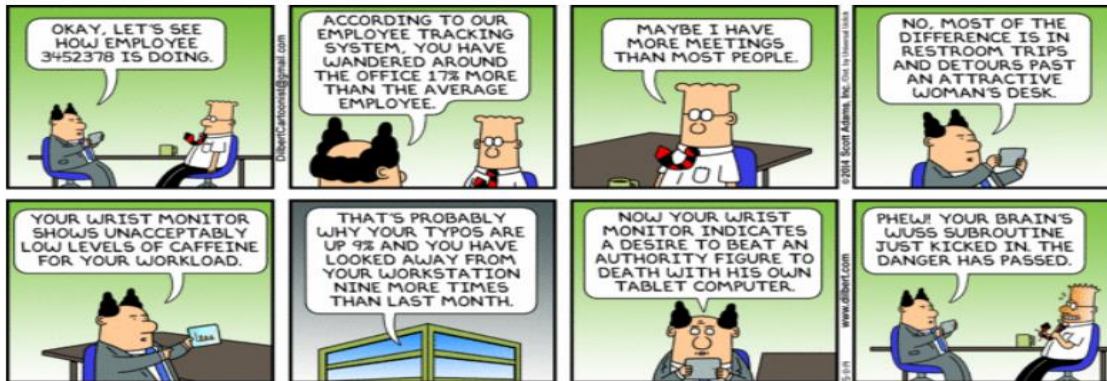
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An Austrian privacy activist has won his next legal battle against so-called "model contract clauses" used by thousands of multinational companies, including Facebook and Amazon, to legally transfer Europeans' personal data to the US.

Max Schrems, the 28-year-old data privacy activist from Austria, has become well-known because of his long-lasting court battle against "Safe Harbor," a personal data transfer deal sealed between the US, the EU and Switzerland. It allowed transnational companies like Facebook, Google or Amazon to collect and analyze private data on the US premises.

In October last year, the Court of Justice of the European Union (CJEU) has ruled against the "Safe Harbor" following Schrems' complaint that he filed in 2013. Appealing to the top EU court, Schrems, then a law student, argued that the US legislation did not ensure enough protection against surveillance on data sent via Facebook to the United States.

Dilbert and the Dark Side of The Quantified Self



ORG Nanotechnology Physics Earth Astronomy & Space Technology Chemistry Biology Other Sci

How 'right to be forgotten' puts privacy and free speech on a collision course

November 21, 2016 by George Brock, The Conversation



Credit: Christopher Titus

The age of digital technology, in which we can search and retrieve more information than we could in any previous era, has triggered a debate over whether we have too much information. Is the cure to "unpublish" things we think are wrong or out of date? Ought we have a "right to be forgotten"?

Should you have the right to opt out of the IoT?

- More environments will use surveillance and monitoring to keep us safe, ensure productivity, customize experience, etc.
- Should you have the right to opt out? Should you have the right to access your data? Control your data? Delete your data? **How would this work?**
- **Is it even possible to opt out of the IoT?**

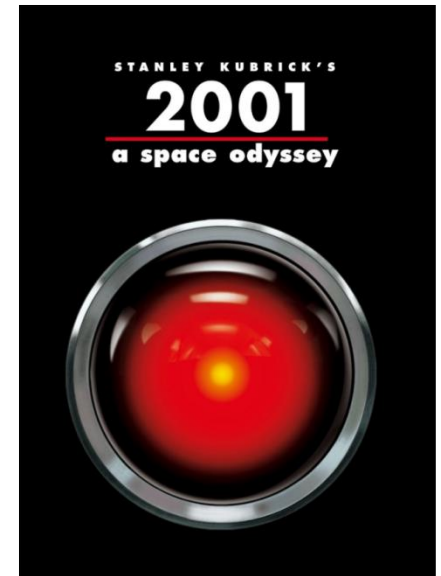


MyMagic+ MagicBand Photo: Matt Strohane, courtesy of Disney



Automated Decision-Making – When should there be a human in the loop?

- IoT automated systems will increasingly manage behavior in the background
- Which decisions should be made by technology and when should there be a human in the loop?
 - Whose interests should systems represent?
- How do we ensure that automated systems don't limit our choices?



Digital Ethics

- Ethics: How do we promote the ethical use of technology?
- Do we need *artificial ethics* to complement artificial intelligence?
- Whose ethics should they be?

ATI INDUSTRIAL AUTOMATION Robotic End-Effectors

IEEE Standards Association Introduces Global Initiative for Ethical Considerations in the Design of Autonomous Systems

Visit <http://www.ieee.org> for further information

Algorithms can be racist: Why CXOs should understand the assumptions behind predictive analytics

With predictive models making decisions about hiring, pricing, and even policing, here's how IT leaders can understand and mitigate fears that these mathematical models are biased.

By Petric Gray | November 23, 2016, 10:37 AM PST

Is Your Website Working...

WHITE PAPERS, WEBCASTS, AND DOWNLOADS

- Training // From LinkedIn
Data Science and Machine Learning with Python
If you've got some programming or scripting experience, this course will teach you the techniques used by real data scientists in the tech industry - and prepare you for a move into this hot career path. This comprehensive course includes 68 lectures spanning almost 9 hours of video, and most topics include hands-on Python code examples you can use for reference and for practice.
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Flash To The Future
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How Network Automation Helps Make IT Agile
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self-driving cars
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Play this killer self-driving car ethics game

Posted Oct 4, 2016 by **Josh Constine** (@joshconstine)

What should the self-driving car do?

Should a self-driving car full of old folks crash to avoid puppies in the cross-walk? Is it OK to run over two criminals if you save one doctor? Whose lives are worth more, seven-year-olds

You've got ideas

NEW

The D Get it

Evolving an Effective Governance Structure for the IoT: Next Steps

- We need **national-level discussion and pilots** in/about practice, policy, regulation for the IoT
 - Need **foundational reports, task forces** to advanced well-evidence approaches that will underlie policy and regulation
 - Need **experience with pilot governance frameworks** for IoT environments – smart campuses/cities/environments
 - Need **deep partnership with technology providers to instrument technology** at the architecture and development stage to support social governance
- If we delay the development of social governance until technology is mature, we do so at our own risk

