THE GOOD & EVIL OF THE INTERNET AND WHY YOU SHOULD KNOW ABOUT THEM

WEEK 5

OLLI WINTER 2020 COURSES

- Mondays, January 27—March 2
- 9:30—11:30 a.m.
- @Cooperage

OSHER LIFELONG LEARNING INSTITUTE

Dr. Farid Farahmand

A Quick Check-in…..

- Thank you for completing the survey

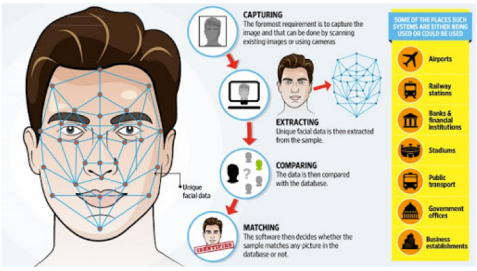
- Uploaded the slides
- Let's hold on to your questions for the first 45 min

What We Cover Today

- Quick review…..
  - Face Recognition Technology.
- IoT, Data Collection & Big Data
- Next week:
  - 5G
  - Cloud
  - Securing your computer
  - Discussion

Facial Recognition Technology

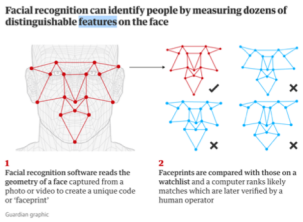
- A facial recognition system is a technology capable of identifying or verifying a person from a digital image or a video frame from a video source



Facial Recognition Technology

- The algorithms came from a range of major tech companies and surveillance contractors

- The systems are developed by companies inside or outside the U.S.:
  - Intel,
  - Microsoft,
  - IBM,
  - Face++
  - Panasonic,
  - SenseTime,
  - Vigilant Solutions,
  - Amazon,
  - And more….

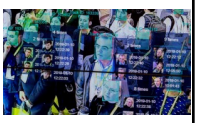


Federal Governments and FR Systems

- Benefits and challenges of implementing the facial recognition systems

https://www.cnn.com/2019/07/17/tech/cities-ban-facial-recognition/index.html

Facial Recognition



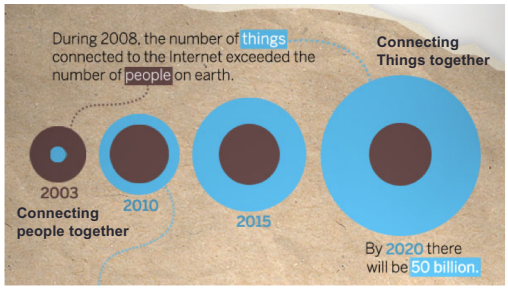
- Amazon's most audacious attempt to shake up the retail world, the cashless, cashier-less Go store.
  - Mainly the system is made up of dozens and dozens of camera units mounted to the ceiling, covering and recovering every square inch of the store
  - https://www.youtube.com/watch?v=NrmMk1Myrxc
- More than 200 airports in China use facial recognition for passengers to check-in
  - Watch video: https://www.youtube.com/watch?v=IH2gMNrUuEY

Issues with Facial Recognition Systems According to National Institute of Standards and Technology (NIST),

- The system is widely used by **law enforcement across the United States**.
- Facial-recognition systems **misidentified people of color** more often than white people, a landmark federal study has released
- Asian and African American people were up to **100 times more likely to be misidentified** than white men,
- **Native Americans had the highest false-positive rate** of all ethnicities, according to the study, which found that systems varied widely in their accuracy.
- Algorithms developed in the United States also showed high error rates for "one-to-one" searches of Asians, African Americans, Native Americans and Pacific Islanders.
- NIST said Amazon did not submit its algorithm for testing.

New Topics

Changing Trends in Communications



Sources: Cisco IBSG, Jim Cicconi, AT&T , Steve Leibson, Computer History Museum, CNN, University of Michigan, Fraunhofer

Image Courtesy: : CISCO

Today's Communication Systems: Connecting Machines Together

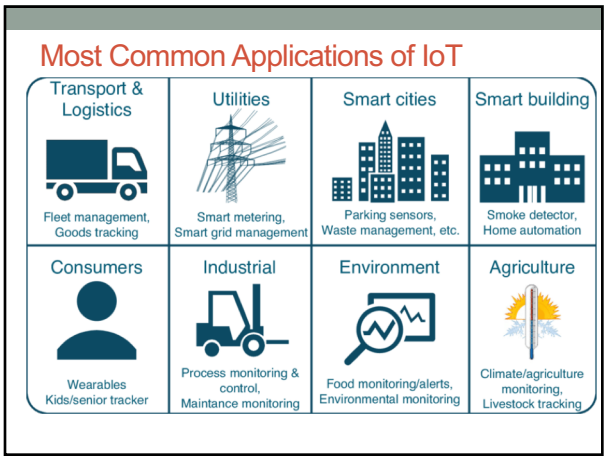
Human-to-Things Communications! → Things-To-Things Communications

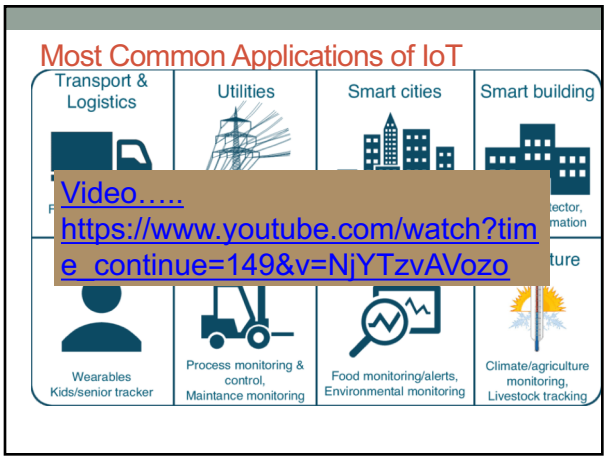
Any TIME, Any PLACE + Any DEVICE

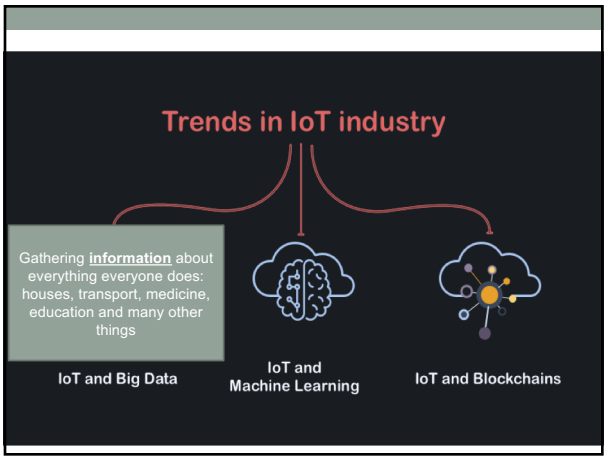
Internet-of-Things (IoT) – A Definition

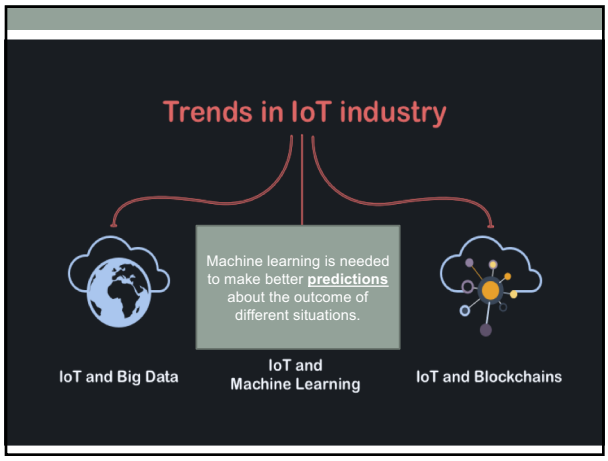
The set of
technologies and solutions
that enable integration of
real world data and services
into the existing
information networking technologies

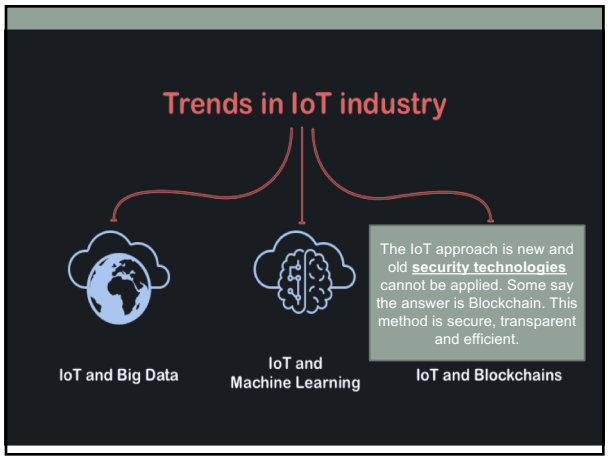
IoT is an evolution of the Machine to Machine (M2M) market.

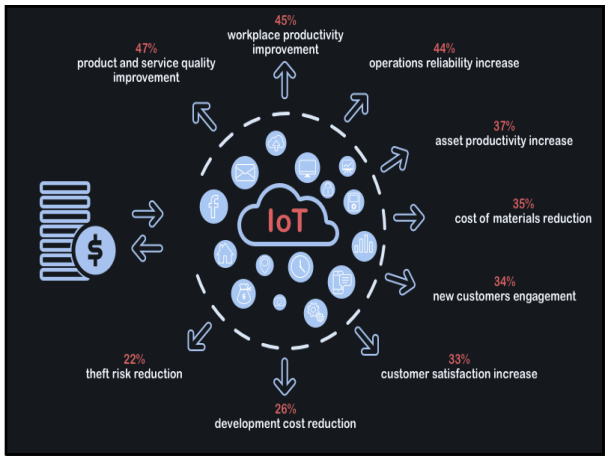

Most Common Applications of IoT
Transport & Logistics
Fleet management, Goods tracking
Utilities
Smart metering, Smart grid management
Smart cities
Parking sensors, Waste management, etc.
Smart building
Smoke detector, Home automation
Consumers
Wearables Kids/senior tracker
Industrial
Process monitoring & control, Maintance monitoring
Environment
Food monitoring/alerts, Environmental monitoring
Agriculture
Climate/agriculture monitoring, Livestock tracking


Most Common Applications of IoT
Transport & Logistics
Utilities
Smart cities
Smart building
Video…..
https://www.youtube.com/watch?time_continue=149&v=NjYTzvAVozo
Wearables Kids/senior tracker
Process monitoring & control, Maintance monitoring
Food monitoring/alerts, Environmental monitoring
Climate/agriculture monitoring, Livestock tracking

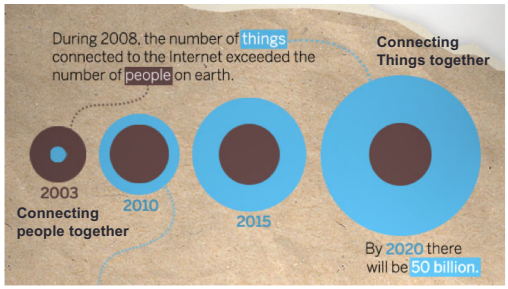

Trends in IoT industry
Gathering information about everything everyone does: houses, transport, medicine, education and many other things
IoT and Big Data
IoT and Machine Learning
IoT and Blockchains

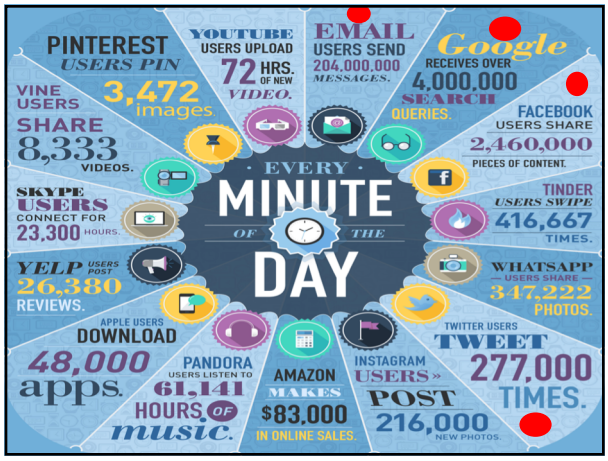

Trends in IoT industry
Machine learning is needed to make better predictions about the outcome of different situations.
IoT and Big Data
IoT and Machine Learning
IoT and Blockchains


Trends in IoT industry
The IoT approach is new and old security technologies cannot be applied. Some say the answer is Blockchain. This method is secure, transparent and efficient.
IoT and Big Data
IoT and Machine Learning
IoT and Blockchains


45%
workplace productivity improvement
47%
product and service quality improvement
44%
operations reliability increase
37%
asset productivity increase
35%
cost of materials reduction
34%
new customers engagement
33%
customer satisfaction increase
26%
development cost reduction
22%
theft risk reduction
IoT

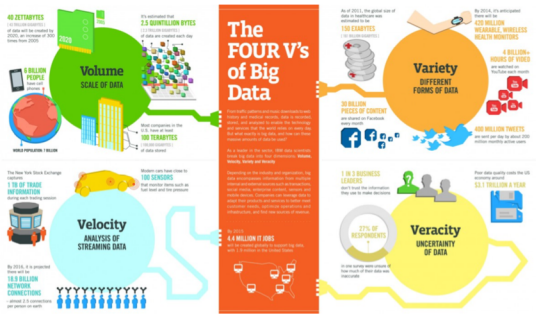
It is all about connectivity…..



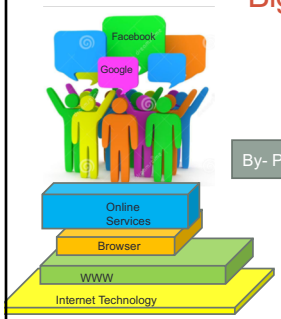


Components Big Data

The Four V's of Big Data



Big Data: A By-Product

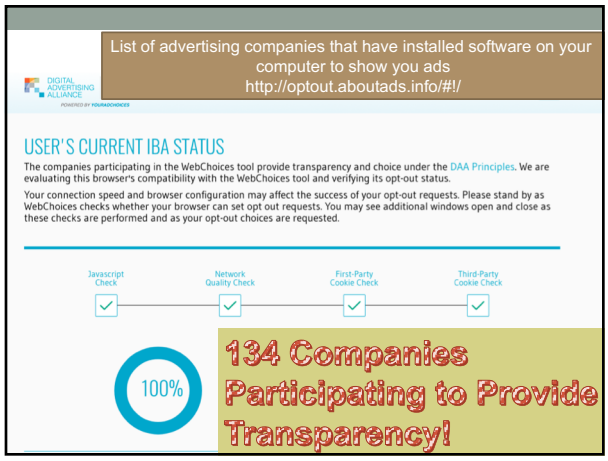


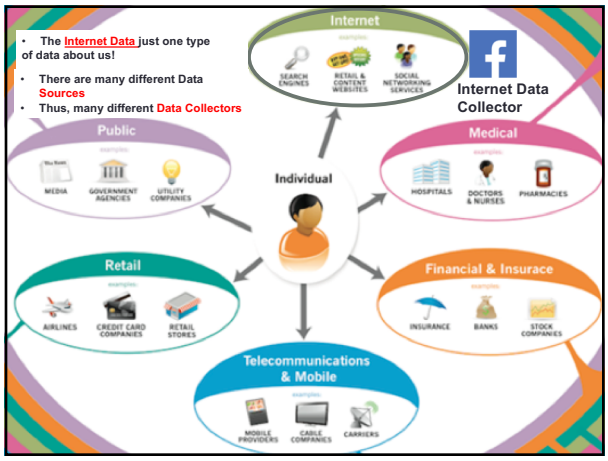
By- Product

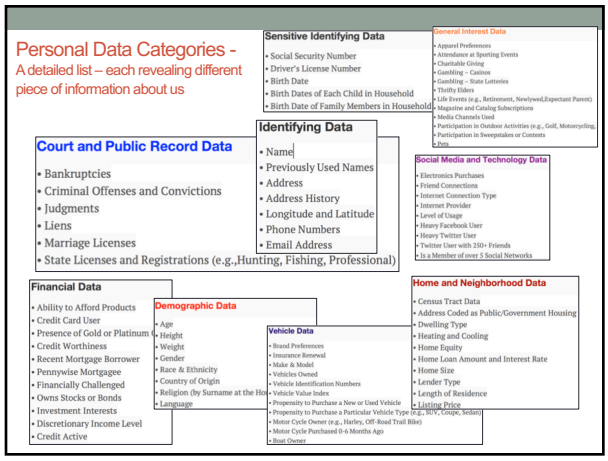
- As we use the digital technology we generate data
- The more we interact with our devices, the more data we generate → Lots of Data → **Big Data**

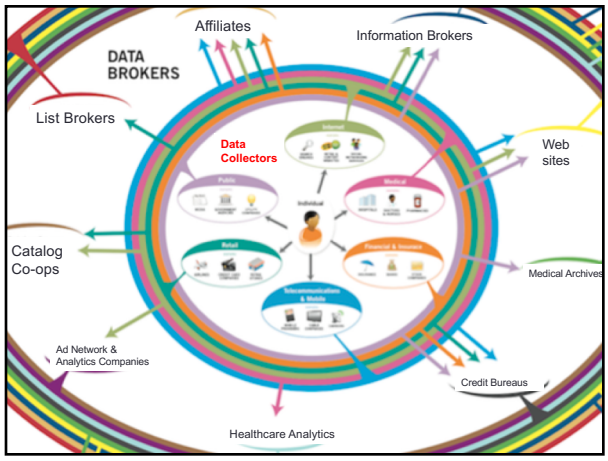
Generating Big Data
(personal data)
Analyzed Data
Targeted Advertising/
Sell to advertisers
Selling TV
Selling Shoes
Advertising Companies

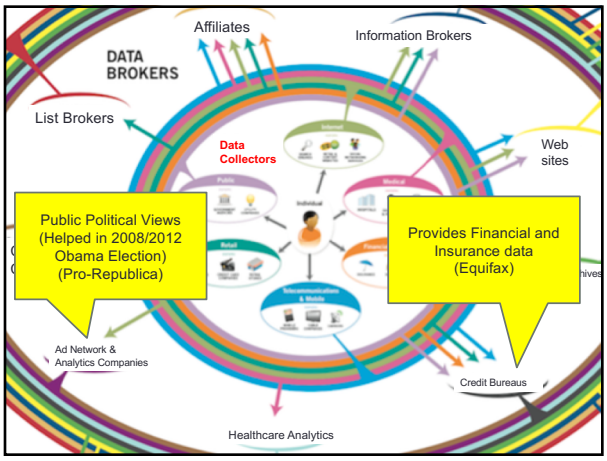
Facebook is likely the largest database of people ever built, and contains more personal data than any other source.
Sell to advertisers
Selling TV
Selling Shoes
Advertising Companies


List of advertising companies that have installed software on your computer to show you ads
http://optout.aboutads.info/#!/
USER'S CURRENT IBA STATUS
The companies participating in the WebChoices tool provide transparency and choice under the DAA Principles. We are evaluating this browser's compatibility with the WebChoices tool and verifying its opt-out status.
Your connection speed and browser configuration may affect the success of your opt-out requests. Please stand by as WebChoices checks whether your browser can set opt out requests. You may see additional windows open and close as these checks are performed and as your opt-out choices are requested.
Javascript Check
Network Quality Check
First-Party Cookie Check
Third-Party Cookie Check
100%
134 Companies Participating to Provide Transparency!


• The Internet Data just one type of data about us!
• There are many different Data Sources
• Thus, many different Data Collectors
Internet
SEARCH ENGINES
RETAIL & CONTENT WEBSITES
SOCIAL NETWORKING SERVICES
Internet Data Collector
Public
MEDIA
GOVERNMENT AGENCIES
UTILITY COMPANIES
Medical
HOSPITALS
DOCTORS & NURSES
PHARMACIES
Individual
Retail
AIRLINES
CREDIT CARD COMPANIES
RETAIL STORES
Financial & Insurace
INSURANCE
BANKS
STOCK COMPANIES
Telecommunications & Mobile
MOBILE PROVIDERS
CABLE COMPANIES
CARRIERS

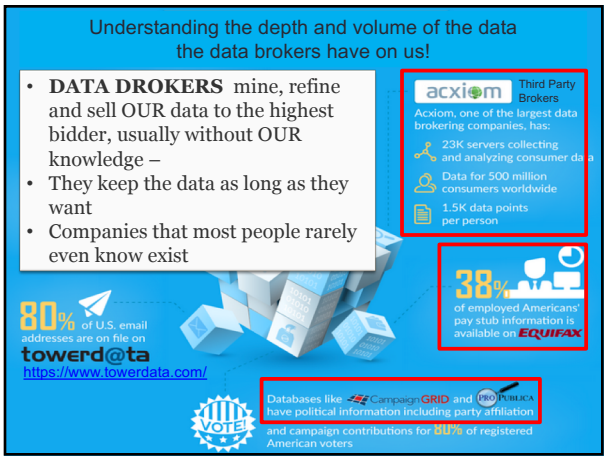

Personal Data Categories -
A detailed list – each revealing different piece of information about us
Sensitive Identifying Data
• Social Security Number
• Driver's License Number
• Birth Date
• Birth Dates of Each Child in Household
• Birth Date of Family Members in Household
General Interest Data
• Apparel Preferences
• Attendance at Sporting Events
• Charitable Giving
• Gambling – Casinos
• Gambling – State Lotteries
• Thrifty Elders
• Life Events (e.g., Retirement, Newlywed,Expectant Parent)
• Magazine and Catalog Subscriptions
• Media Channels Used
• Participation in Outdoor Activities (e.g., Golf, Motorcycling)
• Participation in Sweepstakes or Contests
• Pets
Identifying Data
• Name
• Previously Used Names
• Address
• Address History
• Longitude and Latitude
• Phone Numbers
• Email Address
Court and Public Record Data
• Bankruptcies
• Criminal Offenses and Convictions
• Judgments
• Liens
• Marriage Licenses
• State Licenses and Registrations (e.g.,Hunting, Fishing, Professional)
Social Media and Technology Data
• Electronics Purchases
• Friend Connections
• Internet Connection Type
• Internet Provider
• Level of Usage
• Heavy Facebook User
• Heavy Twitter User
• Twitter User with 250+ Friends
• Is a Member of over 5 Social Networks
Financial Data
• Ability to Afford Products
• Credit Card User
• Presence of Gold or Platinum
• Credit Worthiness
• Recent Mortgage Borrower
• Pennywise Mortgagee
• Financially Challenged
• Owns Stocks or Bonds
• Investment Interests
• Discretionary Income Level
• Credit Active
Demographic Data
• Age
• Height
• Weight
• Gender
• Race & Ethnicity
• Country of Origin
• Religion (by Surname at the Ho
• Language
Vehicle Data
• Brand Preferences
• Insurance Renewal
• Make & Model
• Vehicles Owned
• Vehicle Identification Numbers
• Vehicle Value Index
• Propensity to Purchase a New or Used Vehicle
• Propensity to Purchase a Particular Vehicle Type (e.g., SUV, Coupe, Sedan)
• Motor Cycle Owner (e.g., Harley, Off-Road Trail Bike)
• Motor Cycle Purchased 0-6 Months Ago
• Boat Owner
Home and Neighborhood Data
• Census Tract Data
• Address Coded as Public/Government Housing
• Dwelling Type
• Heating and Cooling
• Home Equity
• Home Loan Amount and Interest Rate
• Home Size
• Lender Type
• Length of Residence
• Listing Price


DATA BROKERS
Affiliates
Information Brokers
List Brokers
Data Collectors
Web sites
Catalog Co-ops
Medical Archives
Ad Network & Analytics Companies
Credit Bureaus
Healthcare Analytics

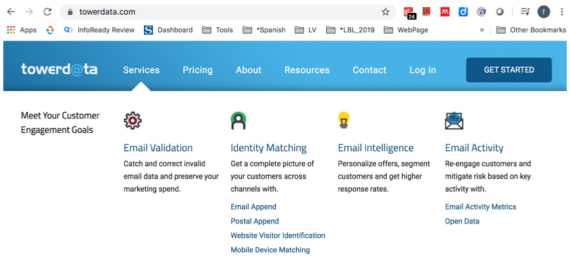


Data Collection and Data Analytics can Save Lives….

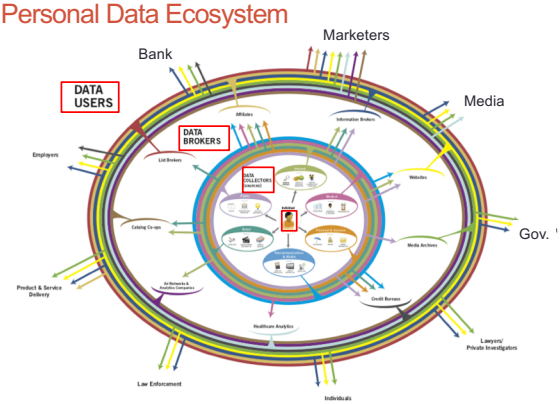
- Watch video



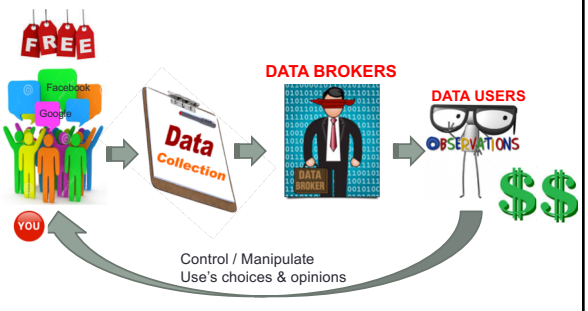
Services offered by https://www.towerdata.com/



Personal Data Ecosystem

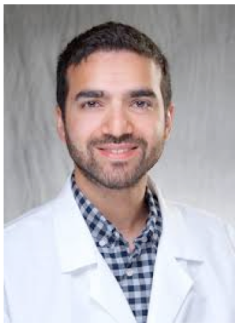


Personal Data Ecosystem – A Corporate View

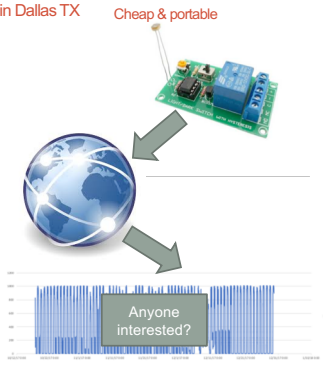


Power of Data
A True Story……

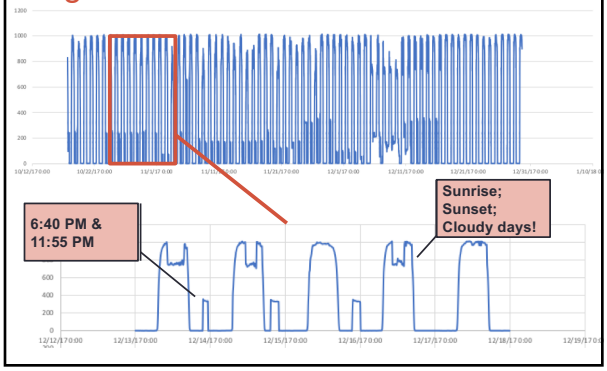
My Brother
Physician, Lives alone in a small Apt. in Dallas TX



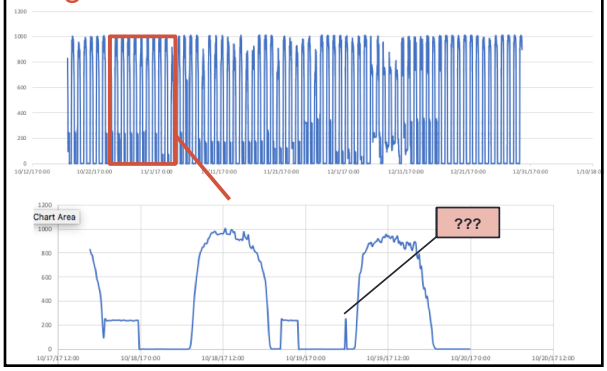
My Light Sensor
Cheap & portable



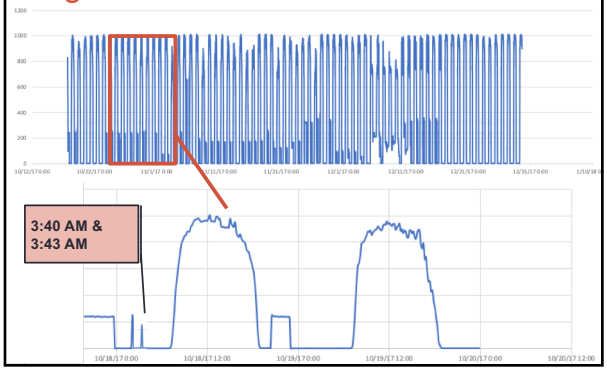
Light Detector Results



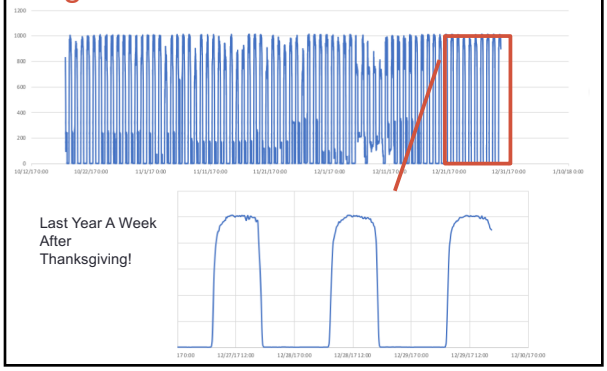
Light Detector Results



Light Detector Results



Light Detector Results



Light Detector Results

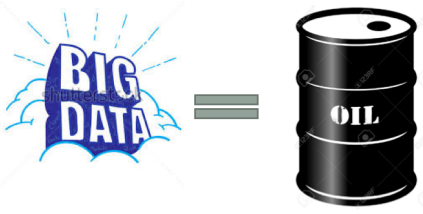
What we can tell:
When he usually gets up
When he usually sleeps
When he usually comes home
Is he alone or not
…
If he has overactive bladder at night

Azo Bladder Control - 54 Capsules
$31.58 from 50+ stores
★★★★☆ 248 product reviews
Dietary Supplement. Go less. Worry less. Help
Azo · Sleep Support · Supplements · Capsule ·
Other options: 72 Capsules ($16)

Back to Our Topic….

THE NEW DATA ECONOMY

DATA is the NEW OIL!
….Just not being traded



What Does Facebook Have On You?

- Facebook makes the vast bulk of its money from ads, and by default, it uses your **profile information**
- Facebook knows your interests, friends, buying habits, and location, among other things
- Facebook can follow your every move on the Web
- Facebook can track what you buy when you're offline

What Does Apple Have on You?

- **Everything you say to Siri**
- **All your locations**
- **All your moves and searches on the web**
- All your iMessages
- Medical records
- And more….

Data Surveillance

Has been around for many decades….

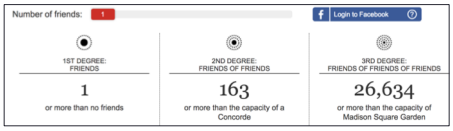
- Corporations:
  - Credit cards (1934 – American Airline)
  - Keeping record of customers → Purchase history
  - Direct marketing → Customer survey
  - Credit Bureaus → Banks → Loan?
- Governments:
  - Public records
  - Phone tapping
  - Mail interception
  - Spying & Espionage

What Has Changed?

Data Surveillance

So what's changed?

- The depth, breadth, and volume of the data being collected! (**Big Data Surveillance**)
  - Not only historical but **behavioral**
  - **Massiveness** of the new surveillance (covers every aspect)
- The nature of the data collection process
  - Free / Volunteer / Limitless / Cheap / Automatic!
  - Hidden (your pictures are geotagged)
  - Relational (three degrees of separation)



Big Data Surveillance

So what's changed?

Gen. Keith Alexander, former director the NSA (Obama Administration), "collect it all" surveillance approach originally **directed at Iraqis in the middle of a war**, and thereafter transferred it so that it is now directed at the US domestic population as well as the global one

NSA's Approach to "Collect it All"

Utah Data Center

- The $2 Billion facility where the NSA stores & analyzes **our communications.**
- The center processes **"all forms of communication"**, the complete contents of private emails, cell phone calls, and Internet searches, as well as all types of personal data trails—parking receipts, travel itineraries, bookstore purchases, etc.

Before Trump Administration….

- It is important to understand that the current electronic surveillance was built by Bush and Obama administration with the full cooperation of the congress

Internet has changed our lives!

Yet,
It is increasingly
becoming a tool to monitor & control!

So What Can We Do?

20

PERSONAL DATA BELONGS TO THE INDIVIDUAL!

- There must be **transparency**
  - Consumers have to be **clear** about the services and what kind of data they are giving away
- Customers must **have alternative choices**
- The user must be **allowed to remove** the data
  - Giving data **voluntarily** is not an issue
  - **Our personal data** is saved and analyzed to learn even more about us!

PERSONAL DATA BELONGS TO THE INDIVIDUAL!

Regardless of whether state or federal law governs the situation, it is almost always **illegal** to **record** a phone call or **private conversation** to which you are not a party, do not have consent from at least one party, and could not naturally overhear….. **Illegal** tape **recording** can have both criminal and civil penalties

GDPR:
General Data Protection Regulation

- Compared to the USA, Europe has proved to be much more proactive in protecting consumers
- The **GDPR** is a regulation in EU law on data protection and privacy for all individuals within the EU (May 25, 2018)
- GDPR Protects privacy data:
  - Basic identity information such as name, address and ID numbers
  - Web data such as location, IP address, cookie data and RFID tags
  - Health and genetic data
  - Biometric data
  - Racial or ethnic data
  - Political opinions
  - Sexual orientation
- Any business handling the data of EU citizens – whether customers, employees or other stakeholders – must comply, no matter where the business is located
- Businesses that do not comply with GDPR will be fined €20 million or 4% of their annual turnover – whichever is the larger sum

GDPR Customer Benefits

- **Marketing Consent:** Many firms including banks, insurance companies, retailers and others will have to send explicit consent requests written in plain English. Perhaps most notable: a lack of a response from the consumer does not indicate consent. **(agree)**
- **Right to be forgotten/erasure:** This allows individuals to request that personal data be deleted or removed in certain circumstances, such as withdrawal of consent, or when that data is no longer accurate. **(erase)**
- **Right to change data:** Consumers can also demand organizations change and/or update any details that are inaccurate. **(change)**
- **Right to portability:** Consumers will be able to demand that organizations provide them with all the personal data they hold on them, in order to transfer it easily to another provider. **(hand over)**
- **Right to access:** Consumers will be able to demand any organization provide them with access to their personal data and relevant "supplementary info." **(access)**

https://blog.centrify.com/consumer-privacy-benefits-gdpr/

Final Remarks…..

- Technology certainly facilitates our lives but we should not be blind to it and just accept it!
  - Don't take it as granted!
  - We should educate ourselves
- The tracking technologies are part of our communication systems; advertisers and governments exploit these technologies
  - Be aware
  - Understand the risks
- Learn about technology
  - Be a part of the discussion
  - We need to have multidisciplinary groups designing our tools…

Final Remarks…..

Remember…..

Any Questions?

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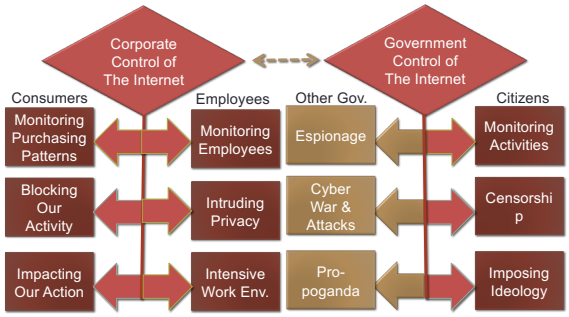
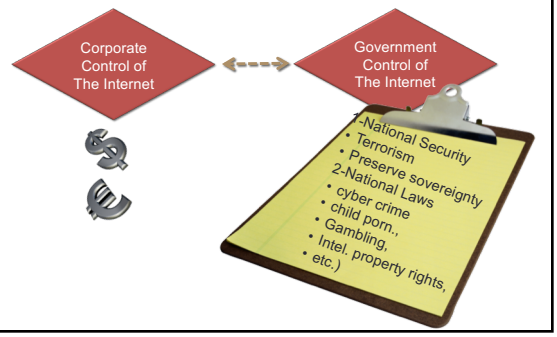
Internet: Enabling Technology of Control



Internet: Enabling Technology of Control

…for very good reasons!



Examples of Government Censorship…

(2011)

- In the second half of 2011 the total number of government requests to Google jumped by 103 percent
  - Google complied with 63 percent of the requests
- Spain: requested removal of 270 search results that linked to **improper** blogs and sites
- Canada: ordered removal of a YouTube clip **disfiguring** a public document (a man urinating on his Canadian passport)
- Thailand: requested blocking local users from viewing more than 100 videos **insulting** the monarchy
- Turkey: ordered restricting access to videos **insulting** the founder of modern Turkey (Ataturk)
- France: forced Google to filter its auto-complete feature violating its **copyrights Law**

Government Control

- U.K.:
  - Seeking a **kill-switch** to shut down the Internet during major demonstrations
    - "…we are working with the police…. to look at whether it would be right to stop people communicating via these websites and services when we know they are plotting violence, disorder and criminality." – U.K. Prime Minister David Cameron
  - In July 2012, the parliament introduced a new data communication bill requiring all ISPs to keep tabs on their users (cost=$1.8bn over 10 years)
- Denmark:
  - Wikileaks has released the list containing 3863 sites blocked by Danish ISPs (voluntarily) as of February 2008
  - In March, 2012, a "human error" carried out by the police resulted in 8000 websites being completely blocked at the DNS level – marked as sites offering child pornography

Watch What You Say…..

(2012)

- Saudi Arabia: The government filters any topics related to drugs, bombs, alcohol, gambling - authorities receive over 1,200 requests everyday to have web pages blocked

Watch What You Say…..

(2012)

- Saudi Arabia: The government filters any topics related to drugs, bombs, alcohol, gambling - authorities receive over 1,200 requests everyday to have web pages blocked
- Kuwait: A 20 year-old blogger got 10 years in prison for defaming the Saudi & Bahraini government
- Bahrain: Nabeel Rajab, president of the Bahrain Center for Human Rights was sentenced on July 10 to three months in prison for a tweet
- Oman: Four young men received 3-6 months in prison for posting on social networks
- U.K.: A 17 year-old was detained after sending a malicious tweet to British Olympic Diver: "You let your dad down, I hope you know it!"
- Israel: "Facebook posts and Twitter feed" matter of state security – "We [the censors] try to operate within the internet only in terms of elements related to us."

Remember London Uprising? (August 6-11, 2011)

- "…a number of BlackBerry users reported receiving instant messages that suggested future riot locations."
- Research in Motion, which makes Blackberry phones, issued a statement in which it promised to work with the authorities.
  - "Like other telecoms companies, it complies with the Regulation of Investigatory Powers Act (RIPA) allowing law enforcement to gain access to private messages when they relate to the commission of a crime!

BBC: http://www.bbc.co.uk/news/technology-14442203

In the U.S. …..

- In October 2010 the Electronic Frontier Foundation discovered the US Department of Homeland Security (DHS) had set up a "Social Networking Monitoring Center" to collect and analyze social media and other online communications
- Currently, the U.S. government claims that it doesn't need to go to a judge and get a full probable cause warrant before tracking cell phones
  - A California student was being secretly tracked by FBI
- U.S. Justice Department indicted 11 Web site operators selling illegal devices including bongs, holders for marijuana cigarettes, water pipes, roach clips, chillums, and small spoons used with cocaine
  - They called it *Operation Pipe Dreams*

By application of the United States Drug Enforcement Administration, the Web site you are attempting to visit has been restrained by the United States District Court for the Western District of Pennsylvania pursuant to Title 21, United States Code, Section 853 (e)(1)(a)."

Government Monitoring in U.S.

- National Security Agency (NSA)
  - AT&T's regional switching center in San Luis Obispo, 611 Folsom Street, Seventh floor
  - 80 percent of all communications from Asia enters the United States
  - In 2003 NSA mirrored all the cables carrying domestic and international calls entering the seventh floor and rerouted them to a secret room one floor below

PBS: NOVA: http://www.pbs.org/wgbh/nova/military/spy-factory.html

Authoritarian Governments & the Internet

"Once the Internet reaches a country it is an unstoppable liberating force"

- Color Revolutions of the former Soviet Union, it was mobile phones
- Saffron Revolution in Burma, it was YouTube
- Green Movement in Iran, it was Twitter

- Over the time these governments have become more powerful to control their Domestic Internet!
  - Sophisticated filtering technology
  - Subtle removal of Web requests
  - Arresting bloggers
  - Tracing emails
  - Creating Intranet (Chinternet)

"The Great (Digital) Wall of China is Being Made by American Bricks! – Thanks to Cisco"

The Internet – A New War Zone

- U.S. & Iran: A computer virus created to sabotage Iran's nuclear program and stop Tehran developing an atomic bomb was designed by American and Israeli experts (Stuxnet & Flame)
- American designed Chinese made ACTEL chip (PA3 FPGA) was shown to have a backdoor deliberately built in it
- U.S. & China: Chinese made laptops reportedly have pre-installed viruses, according to Microsoft
- Egypt & Israel: Israeli sabotage was behind the nationwide crippling of Egypt's Internet in 2008, according to an alleged Mossad agent
- India & Bangladesh: "Bangladesh Black Hat Hackers (BBHH) , Bangladesh Cyber Army (BCA) and Expire Cyber Army (3xp1r3) have fighting with Indian Cyber Army and ashell from Indishel . In last two days , Bangladeshi hackers hacked hundreds of government websites and more then 20,000 other websites of their rival countries and Indian hackers hacked 50 government websites and upto 3,000 other websites . In Facebook , the groups and pages of those hackers groups have also mentioned the link of the sites they have had hacked."

Final Remarks…..

- Combination of digital/information technology continue to provide smaller and smarter devices
  - They do everything for us!
- They have created powerful tools with potentially diverse consequences
  - They empower us, yet they can control us!
- Any technology can only fit within the socio-economic structure of the society
  - Technology in a country with oppressive government will turn into tool of oppressor
- Become more active, participate, and demand public monitoring
  - Know what you are disclosing
  - Use privacy tools and filtering
  - Protect your network address
  - Promote Net Neutrality, Public Broadcasting, Internet Freedom
- Ask the right questions!
  - How is your privacy protected?
  - How can we preserve public access?
  - Who is monitoring?

Further Research

- Why is Net-neutrality so important?
- What are examples of technologies that protect public interest?
- How educated are we when it comes to protecting our privacy over the Internet?
- Why is public broadcasting important?
- Investigating teens' attachment to their cell phones

References

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- How TCP works:
  - http://www.tech-faq.com/understanding-microsoft-tcp-ip.html
- TOR Project
  - https://www.torproject.org/about/overview
- AOL Scandal
  - http://aolscandal.com/
- Book: What Google Has on you
- Book: The Big Switch

Any Questions?

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