

Observe Yourself — Help Your Government

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About me

- Currently working as software engineer
- Refugee from academia
- Debian Maintainer
- GPGPU: PyOpenCL, PyCUDA
- Sputnik



Motto

Something weird happened on the way over. Basically I guess I have a routine where I drive down the same road, who doesn't? And Tuesday afternoons finds me driving west on a road we call 25a. Wonderful road if you're from some other part of the world come and visit it it is really nice. And right around 5 30ish or so I find myself taking turn on the Nicols road, the road that is adjacent to the University campus. And today as I made up that turn I saw an 18-wheel truck coming in the opposing track, heading towards me. And I have an arrow so he was rightfully stopped. What was interesting about this is that is the postal 18-wheeler. Now the postal office is just further back from where I just come from and every day at 6 o'clock a big 18 wheel truck shows to pick up a mail that been dropped there. And that's a pretty set schedule, every day at 6 o'clock 18-wheeler goes up the hill to the post office.

Here is the thing. This week this show when I was driving to this show at about 5:30 making that left-hand turn seeing that 18-wheeler on it's way to a post office, do you know That is the third week in the row this has happened. The third week in a row when I was making that left turn at that particular time and that same 18-wheel truck was there in the on-coming lane waiting at the red light I have caused by making my left turn.

And I wonder to myself: Have I become this predictable when I am at the same place at the exact same time every week and I am starting to see the same people who just happened to past by at at one fleeting moment?

And my God, how pathetic is that?!

I remember there was this photo project. Somebody set up a camera at the particular intersection in the New York city. And every morning at 8:30 or sth it snap picture. Every morning, winter, summer, spring, for for years and years and years. And then after those years passed by looking at this pictures you see the same people because they all are going to the work. And they are going down the street every day at the same time. You see them getting older as their entire life been played out. Because that's what they do - they do the same thing every single day. And I thought it was intriguing. Wow — this is how it is, this is how predictable, how the same, day after day, after day.

And ask yourself. Are you on the same place every day at the same time? I mean I have to be here every Tuesday evening, that's a given, this is how it works. But I don't have to be on the same street on a way over here at the same time every day. I mean every week or whatever.

Predictability is something for me to fall in pretty easily. But try not to. So and ask yourself. Maybe doing occasional random check to see where your are at the particular time to see if actually you are doing the same thing. And you might be frightened by the results.

Emmanuel Goldstein, Off the Wall, 2007-03-06, 13:40 of the show

Mobile phones

- More and more present in our lives
- People spend more times with phones than with family
- Know a lot about us
- Increasing presence in public discourse
 - “NIE”, 26/2007
 - Piotr Gadzinowski
 - “Pamiętka pierwszej komórki”



User context

- Phone is with us
 - It knows our location
 - It knows what we are doing
 - It has more and more sensors
- More memory, more processing power

John Doerr

“iPhone and this class of devices really matter because they are personal; they know who you are, they know where you are, they are broadband, they are always connected, and they are in your pocket”

<http://itc.conversationsnetwork.org/shows/detail3975.html>

2013

What's on mobile

- Contacts
- Emails, messages, history of communication
- Facebook, Google+, other social networks
- Browser history
- Photos
- Files (Dropbox, Google Drive, etc.)
- Books and other media
- Passwords, access - e.g. second factor
- Mobile banking



Not only phones

- Taiwan card www.bbc.co.uk/news/technology-21410362
- Entire life on one card
 - bus
 - payment
 - health
- Bialystok
 - bus card
 - university ID
 - library card
 - sport club
- Warsaw - bus ticket and credit card
- Unification of much of our lives in one item
- Similar situation now with Android and Google account



State

- E911 and E112
- EU data retention law
- Poland
 - Special laws forcing telecommunication companies to retain data (Dz.U. 2009 nr 226 poz. 1828, 2009-12-28)
 - Was used to spy on journalists
 - Conflicting laws — personal information vs. state secrets
- Sweden (CACM 2009-02)
- USA: Echelon, PRISM, ...
- Mobile forensics



Hardware

- GSM and its inefficiencies
 - Closed modem
 - Jailbraking - result of closed devices
- RRLP (related to E911 and E112)
- Encryption
- Hardware design (e.g. Exynos)
- Special tools to dump content of the phone



Software

- Screenshots of applications
- Messages on lock screen
- Application permissions
- Location history
 - Renaud Lifchitz “Android geolocation using GSM network. Where was Waldroid?”
<http://events.ccc.de/congress/2010/Fahrplan/events/4151.en.html>
- Recent Motorola affair



Companies

- KDDI from Japan gathering accelerometer data to trace work of employees <http://news.bbc.co.uk/2/hi/technology/8559683.stm>
- Poland - SMS “trace your children”
- Spam “Trace your spouse”
- More access through applications
- Location
 - Google Latitude
 - Google Now
 - L. Aaron Kaplan “Location tracking does scale up. How skyhook wireless tracks you continuously”
<http://events.ccc.de/congress/2009/Fahrplan/events/3600.en.html>

Applications

- Android Design, Google I/O 2013
- Gather data about user
 - Google Analytics
 - Play store developer console
 - Analyse by country, device, etc.
- Battle of applications for attention
- Notifications



Scientists

- Bluetooth and RFID tracing (e.g. in UK)
- <http://news.slashdot.org/story/13/07/08/1516231/mit-project-reveals-what-prism-knows-about-you>
- <https://immersion.media.mit.edu/>
- More in next section



Changes of mobile applications

- Google IO presentations
- Personalization
 - Echo chamber
 - Lack of challenging of knowledge
 - Lack of common ground with others
- Observing and analysing of user
 - how long we use application
 - how long are we spending at screens
 - how long we use mobile



Ideal assistant

- Also Apple in iOS 7
- Knows where is work, home
- Knows routes
- Alerts about traffic
- Useful
- Trust question



Figure : Anna Chapman (source: Wikipedia)

Who is in control

- Autonomous programs making decisions
<http://shkspr.mobi/blog/2013/07/the-invisible-nightmare/>
- Sites and programs try to emulate peoples, poorly
- “The rise of over-familiar websites”
<http://www.bbc.co.uk/news/magazine-21196793>
- “Socializing” applications
 - Engagement
 - Badges
 - Putting notifications into user social circle



Social changes

- People are willing to trade privacy for benefits
- Web redefining our identities
<http://www.bbc.co.uk/news/technology-21084945>
- More connectivity
- More membership in social applications
- Demanding access to social sites
- Contacts through social sites



Research scene

- Research on various aspects
 - Looking only at chosen topics
 - No unification
- Analysed groups limitations
- Seem not related to “ordinary” people



Our community

- “The Attendee Meta-Data Project”
- Sputnik
- Milosh Meriac, Henryk Plötz
- RFID, NFC
- Harald Welte,
- Travis Goodspeed
- Karsten Nohl
- Steven Rambam “Privacy is Dead - Get Over It”
- Robert David Steele



Interesting presentations

- Peter Wayner “Building the Anti-Big Brother Databases”, HOPE 6
- Paul V “Geo-Tagging: Opting-In to Total Surveillance”, The Next HOPE
- Tobias Engel “Locating Mobile Phones using SS7”
<http://events.ccc.de/congress/2008/Fahrplan/events/2997.en.html>
25C3
- Mike Brennan “ Privacy and Stylometry. Practical Attacks Against Authorship Recognition Techniques”
<http://events.ccc.de/congress/2009/Fahrplan/events/3468.en.html>
26C3
- Conrad Lee “Privacy Invasion or Innovative Science? Academia, social media data, and privacy”
<http://events.ccc.de/congress/2011/Fahrplan/events/4712.en.html>
28C3
- Christie Dudley “Privacy and the Car of the Future. Considerations for the Connected Vehicle”
<http://events.ccc.de/congress/2012/Fahrplan/events/5095.en.html>
29C3

Different topics of research

- Special Communications of ACM issue on RFID
 - September 2005 (long ago)
- Privacy — in advertising, online, etc.
- Location — increasing accuracy, analysing
- Wireless sensors
- Biometrics
- GSM
- Digital identity, personal memory storage



Increased interest in privacy

- Samuel Greengard “Privacy matters”
 - risks of stealing personal data
 - also about “connecting the dots”
 - **differential privacy**
- Richard Becker et al. “Human mobility characterization from cellular network data”
- Beki Grinter “A big data confession”



Interesting articles

- Steffan Baron “Understanding the Market for RFID Traces”
- Miyaka Ohkubo et al. “RFID privacy issues and technical challenges”
- Dwork, Cynthia “A firm foundation for private data analysis”
- Schwartz, Ari “Identity management and privacy: a rare opportunity to get it right”
- Marta Gonzales “Understanding individual human mobility patterns”
- Vassilis Kostakos “The privacy implications of Bluetooth”
- Alexander Pons “Biometric marketing: targeting the online consumer”
- Mary Czerwinski et al. “Digital memories in an era of ubiquitous computing and abundant storage”
- Abigail Sellen “Beyond total capture: a constructive critique of lifelogging”
- Lin Liao “Learning and inferring transportation routines”

Research communities

- Social Signal Processing <http://sspnet.eu/>
- Research group dealing with Social Signal Processing and Social Intelligence
- European Network of Excellence in 7th FP
- ERCIM 93
 - Reality mining in the cloud and mobile
 - Positioning mobile terminals
 - Scheduling data mining applications
 - Sensors on the smart phone
 - Quality of service
 - Crowd sensing
 - Analysing privacy leaks
 - Social links revealing using WiFi
 - Social electricity



Data synthesis

- Tel Aviv University team uses GSM towers to trace weather
- They use signal strength to measure amount of water in the air
- <http://www.bbc.co.uk/news/science-environment-21290976>
- MIT researchers collected electronic communication of millions of New Yorkers
- Data was aggregated at the switches and did not come from individuals
- They used it to show the patterns of communication links to other places



Social networks

- P.S. Bearman et al. “Chains of affection”
 - Analysis of teenagers romantic network
 - Done using paper questionnaires
- Bill Howard “Analyzing online social networks”
- Jon Kleinberg “The convergence of social and technological networks”
- M.E.J. Newman “The Structure of Scientific Collaboration Networks”
 - Building social network using bibliography and authors
- Mark Ryan “Cloud computing privacy concerns on our doorstep”
 - Managing conference submission systems using the cloud
 - As in other cloud solutions, the more data you gather, the greater risk for privacy

Nathan Eagle research

- Strong correlation between proximity of members of team and satisfaction from work
- Inferring relationships using places and times two users are “seen” together
- 90% accuracy; using communication logs and SVM can increase it
- Large teams dynamics can be determined
 - requires knowledge of external data like deadlines, membership of task groups, etc.
- Proximity between group members can be clue to status of group, and its “internal strength”
- “Proximity networks are not reflective of this static organizational structure”

Sensing mood

- Robert LiKamWa et al. “MoodScope: building a mood sensor from smartphone usage patterns”
- Sensing mood basing on used applications
- Individualised learning of usage patterns



No easy way out

- We will not escape from being observed
- At the same time this data is useful
- If not - why do THEY want it so much?
- Can we get access to this data?
- Can we also observe ourselves?



Need for self-observation

- Posts about psychological problems after Aaron Swartz suicide
 - Signs of depression
 - Jono Bacon “Burnout” — “Just a phase”
- Rop Gonggrijp keynote from 27C3
<http://events.ccc.de/congress/2010/Fahrplan/events/4302.en.html>
- Watching the watchers
 - Google showing requests for data
 - Online reputation?



Self-tracing

- Protecting sight
- Avoiding RSI
- Managing money (e.g. GnuCash)
- IDE (e.g. Mylyn)
- Life-recorders
- Dash-cams in Russia
- Car black-box in UK
- Google Dashboard



Usage of gathered data

- Presentation of Deborah Estrin from Where 2.0
- <http://itc.conversationsnetwork.org/shows/detail4612.html>
- Analysis of savings, income, jobs, cities, cost of living
- <http://mikerooney.rowk.com/2013/07/17/8-years-of-income-graphed-and-analyzed-or-how-i-learned-to-stop-working-full-time-and-love-the-savings>



Fragility of human memory

- Leah Graham “Of course it’s true; I saw it on the Internet!: critical thinking in the Internet era”
- Umberto Eco “Vegetal and mineral memory: The future of books”
- Grammenos, Dimitris “FEATURE: The ambient mirror: creating a digital self-image through pervasive technologies”



Quantified self

- https://en.wikipedia.org/wiki/Quantified_Self
- Android applications
 - Life Tag
 - How Are You Feeling
- Total Baby application on iPhone
 - <https://itunes.apple.com/us/app/total-baby/id312198543?mt=8>
 - Andrew Turner: Quantified Baby
 - <http://highearthorbit.com/quantified-baby/>



Health

- More devices analysing our body more fully
- Weight, pressure, sugar, eating habits, amount of exercise
- Measuring sleep
- Observing eating habits
- Measuring workouts
 - Social aspect
 - Ploderer, Bernd “FEATURE: No pain, no gain: pleasure and suffering in technologies of Leidenschaft”
- Lack of immediate benefits causes people to stop



Samsung S Health

- <http://www.samsung.com/global/microsite/galaxys4/lifecare.html>
- Available for Galaxy S4
- Promise to make available for S3 and Note 2
 - S Health application to trace workout and eating
 - Body scale
 - S Band, HRM
- Not available yet
- From application description it looks like data stays on device



Other health-related solutions

- Body Media <http://www.bodymedia.com/>
 - FIT 2
 - Used in some reality show for losing weight
- Withings <http://www.withings.com/>
 - Company from France
 - Body scale, Toddler scale
 - Activity monitor, Sleep monitor, HRM in one device
- FitBit <http://www.fitbit.com/>
 - Tracker, FitBit Flex, Scale
 - Uses badges, “Community”
 - Used to make data public by default
 - “Fitbit makes getting in shape as addictive as checking Facebook and Twitter”
- All require registration on the sites, send data to the cloud

Mental Health

- Mark Mathews et al. “The Invisible User”
- Helping with mental health using technology in effective way
- Young people are used to presence of technology in their lives, so using it can help
- Need to accommodate both users’ and therapists’ needs
- Problems with testing applications on users
 - experts’ opinions (here therapists)
 - peer opinions (healthy population)
 - role playing
 - reviews of prototypes by experts
 - logging (with strong emphasis on privacy)



Problems with existing applications

- Sharing data on social network
- Skinner Box
- User retention
- Badges
- “rewarding users” with some points
 - <http://shkspr.mobi/blog/2013/06/opt-out-of-klout-now/>
 - <http://www.codinghorror.com/blog/2011/10/the-gamification.html>
 - <http://www.codinghorror.com/blog/2012/11/for-a-bit-of-colored-ribbon.html>
 - <http://shkspr.mobi/blog/2012/11/i-dont-want-to-be-part-of-your-fucking-ecosystem/>

Access to the data

- What about open standards?
- Accessing my own data?
- Using own software for analysis?
- “Small data ”
- Data about just one person



Storage of data

- On device or in the cloud?
- Google Reader
- Google Latitude
- People implementing own solutions
 - <https://github.com/dixonl90/Longitude>
- I do not want for government to know how much I eat
- Powerful devices
 - much storage
 - computing power



Need for sharing data

- Usage of data from many people
- Cholera in London
 - John Snow using observations on mortality
- Usage of statistical observations by insurance companies
<http://www.youtube.com/watch?v=LMHipBDeUEs>
- Comparing ourselves to others
- Anonymity



Sharing health data

- Jamie Haywood and PatientsLikeMe.com
<http://itc.conversationsnetwork.org/shows/detail4118.html>
- Sharing data with other suffering the same conditions
- Qualitative assessments allowing for coming to interesting conclusions
- Need to get many patients to have data to analyse
 - Avoiding word “tracing”, using “sharing”
- Psychological need to share experiences with others in similar situation
- Help for patients to have more knowledge when talking to doctors

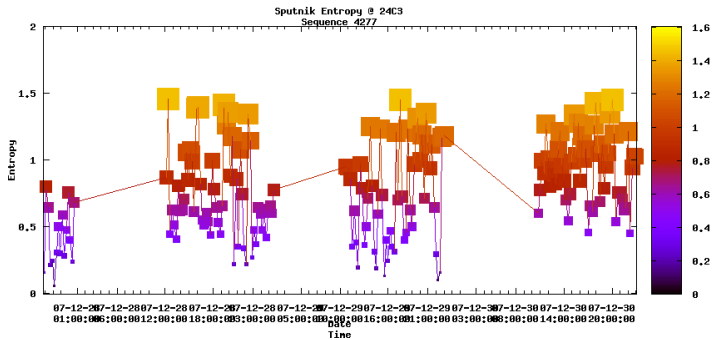


Figure : Behaviour during conference

Psychological problems

- Reality vs. our memories
- Donald Norman “THE WAY I SEE IT: Memory is more important than actuality”
- <http://shkspr.mobi/blog/2012/12/why-facebook-makes-me-feel-like-a-loser/>



Research topics

- Is it possible to join data from different sources?
- What can be discovered using such data?
 - Mobile
 - FaceBook
 - svn, git
 - IDE
- How to protect privacy while being legal?
- Legal limitations for data collection?
- Will it scare people away from technology?
- “Carnegie Mellon Researcher Says Privacy Concerns Could Limit Benefits From Real-Time Data Analysis”
http://www.cmu.edu/news/archive/2009/December/dec17_privacydataa

Summary

We have all of these surveillance creeps who gather enormous amounts of information about us and blindly say nothing bad will ever come of it because we'll be able to keep it safe forever. Well, the fact is that information of value takes on the characteristics of like an immortal zombie, right?; it stalks the internet forever. So you know when Her Majesty's Revenue and Customs in United Kingdom where I live looses the financial data of 25 million households you can bet that this information is just gonna hang like a bad smell forever and that we're never going to be able to get rid of it. The Internet doesn't forget that kind of things in the same way that it's never gonna forget what Paris Hilton genitals look like, right? Thats stuff is just stuck there on the internet, right. Once there are enough copies of it it's doesn't go anywhere.

...

How do we stop our information from leaking on the internet - don't collect it. I think that this kind of personal information is like like Uranium. I came from Ontario where we mine Uranium. The bombs dropped in Japan in 1945 were refined our Uranium. We mine a lot of Uranium and Uranium when it comes out of the ground is pretty non-toxic. You can actually order it through Amazon and have it shipped to your house because it's pretty safe. Once you refine it into Plutonium it's the metal from Hell. It last 750 thousand years, there is not dose so small that it can't give you cancer and it's almost impossible to contain. When you have one little bit of personal information, like which bus you took this morning, which toll plaza you pass through, what's your social insurance number is - that just a tiny bit of unrefined Uranium. But once we convert it into Plutonium by aggregating it with millions of other transaction details, including details from other people all over the world then it's Plutonium and it'll never go away. And the only way to stop it from becoming plutonium is not to make it in the first place. Cory Doctorov http://trashotron.com/agonypodcast/2008/2008-interviews/cory_doctorow-2008.mp3



Potential applications

- Analysing gathered information
 - Need for simple applications for non-technical people to understand
 - Showing data gathered about this user
 - Need to visualise data to get people to understand privacy implications
- Managing sent information
 - Project similar to password wallet
 - Traces what information we gave to particular websites
 - Maybe tries to build our identity from that?



Q & A

Thank you for your attention.

Questions?

Contact me

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- Email: tomasz.rybak@post.pl

