Breaking Big Data

Evading Analysis of the Metadata of Your Life

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hooli

Big Data

Data sets that are so large or complex that traditional data processing applications are inadequate to deal with them.

Source: Wikipedia

What’s being collected?

COLLECT
ALL THE THINGS
memegenerator.net

...and figure out what to do with it later

Will Big Data Cure Cancer?

Big data technologies will play a key role in diversifying Saudi Arabia's economy away from a huge dependence on oil revenues.

How the Chicago Cubs Used Big Data to Win the World Series

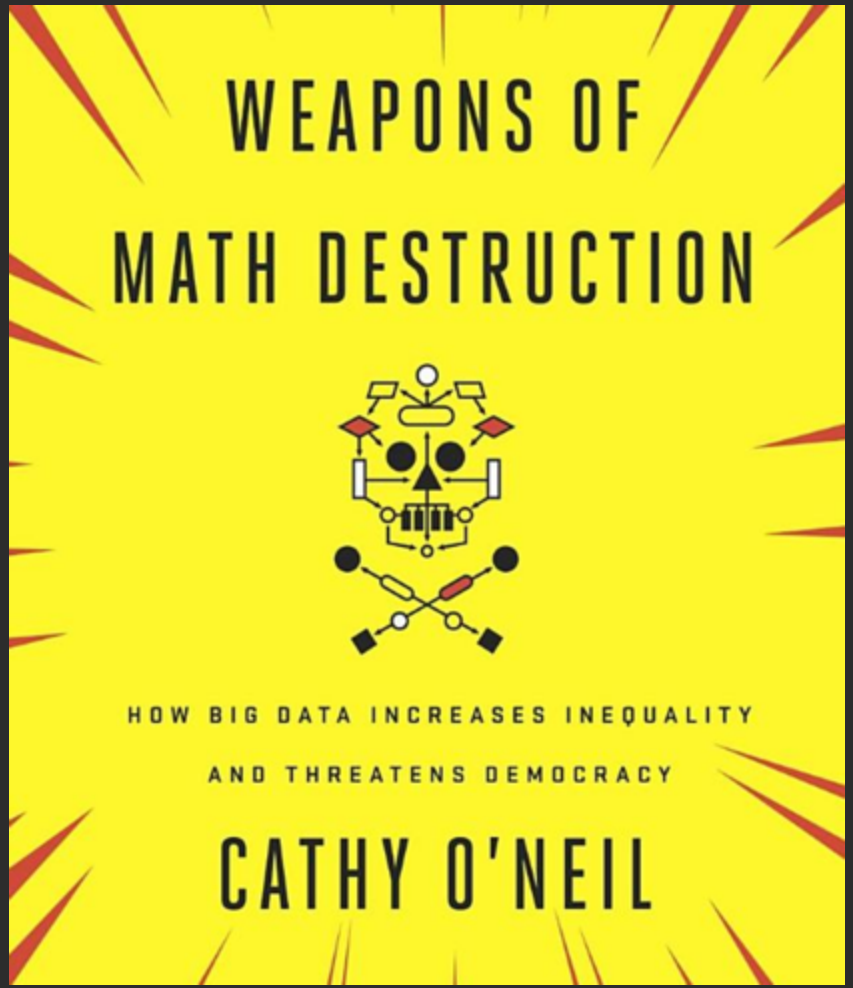
Data + Algorithms = **Big Data**

$3.1T

Source: IBM

Bad

Data + Algorithms = Big Data



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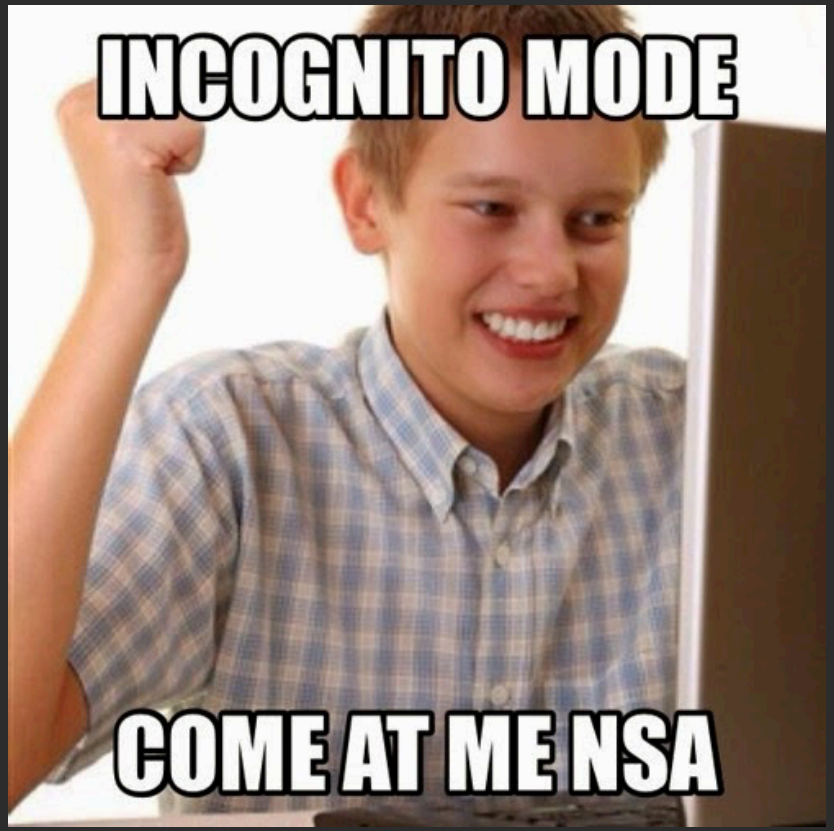
Bad Biased

Data + Algorithms = Big Data

Bad Biased Delusions

Data + Algorithms = Big ~~Data~~


INCOGNITO MODE
COME AT ME NSA

Encryption Works

“Properly implemented strong crypto systems are one of the few things that you can rely on.”

- Edward Snowden

But so what?

Email Content

Messaging

Phone Calls

Packet Payloads

HTTPS Content

Sender

Recipient

Participants

Length

Source

Destination

Encrypted

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Alice and Bob

British Airways → Alice

Alice is in Seoul

“Seoul is so fun!”

Bob → Cindy

Cindy → Bob

Bob → Hotel

Cindy → Hotel

Bob - £500.00 Hotel

Hotel → Restaurant

Bob - £230.00 Restaurant

Restaurant → Hotel

Hotel → Bob’s

Hotel → Cindy’s

Bob → Cindy

Cindy → Bob

Alice is in London

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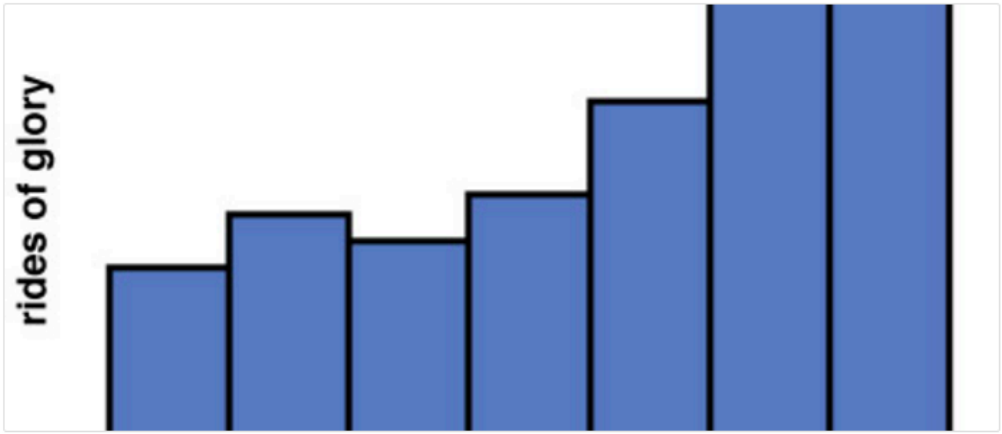
#UBERDATA

RIDES OF GLORY

MARCH 26, 2012

POSTED BY VOYTEK



Original: https://goo.gl/t08BiP

Encryption Works

“Properly implemented strong crypto systems are one of the few things that you can rely on.”

- Edward Snowden

Encryption Works

“Properly implemented strong crypto systems are one of the few things that you can rely on. Unfortunately, endpoint security is so terrifically weak that NSA can frequently find ways around it.”

- Edward Snowden

Endpoints Suck

Ancient Adage

Two types of endpoints:

- Those who have been compromised
- Those who will be

~~Ancient~~ Old Adage

Two types of endpoints:

- Those who have been compromised
- Those who ~~will be~~ don’t know it yet

New ~~Old~~

~~Ancient~~ Adage

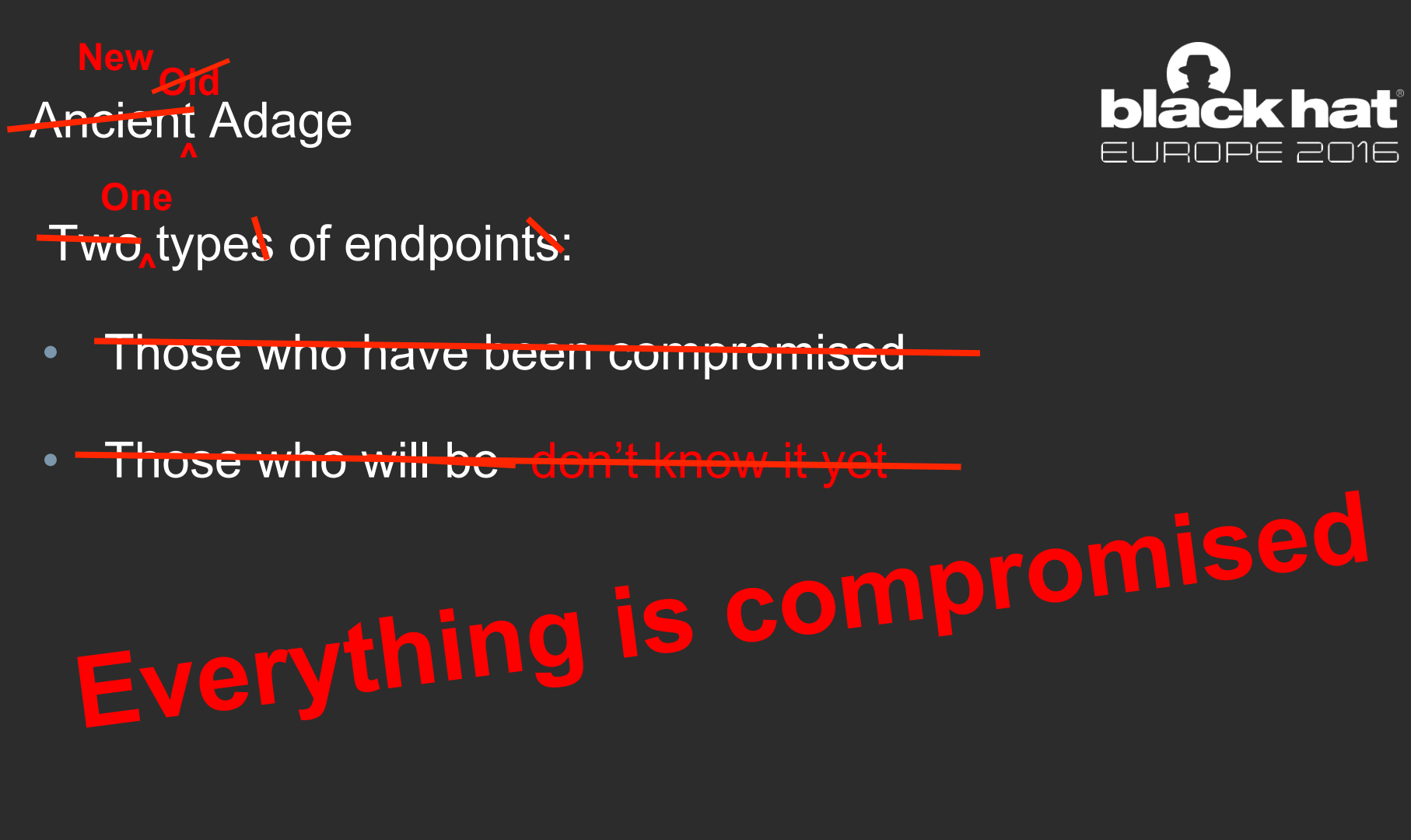
One

Two types of endpoints:

- ~~Those who have been compromised~~
- ~~Those who will be~~ ~~don't know it yet~~

New ~~Old~~

~~Ancient~~ Adage



One

~~Two~~ types of endpoints:

- ~~Those who have been compromised~~
- ~~Those who will be~~ ~~don't know it yet~~

Everything is compromised

...and what isn’t has permission.

Bob

9:00 pm / 21:00

Home → Pub

Bob is driving to the pub

Check in at pub

2:00 am / 02:00

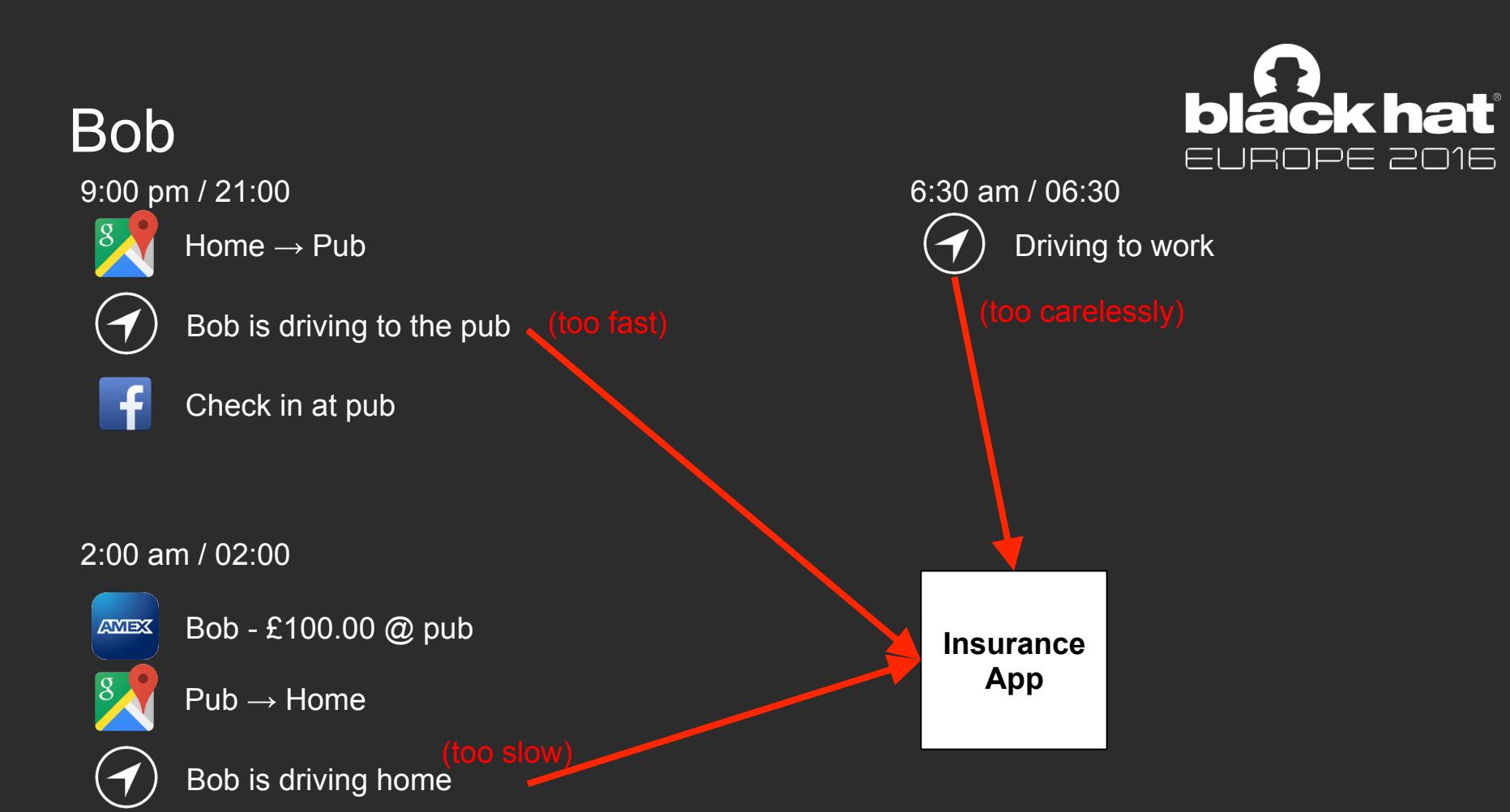
Bob - £100.00 @ pub

Pub → Home

Bob is driving home

6:30 am / 06:30

Driving to work



Your life has patterns

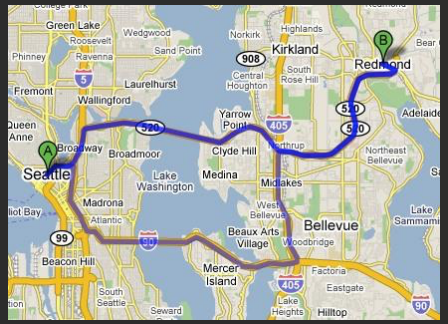
...that produce metadata

BBC

Your habits

#irc

Your locations



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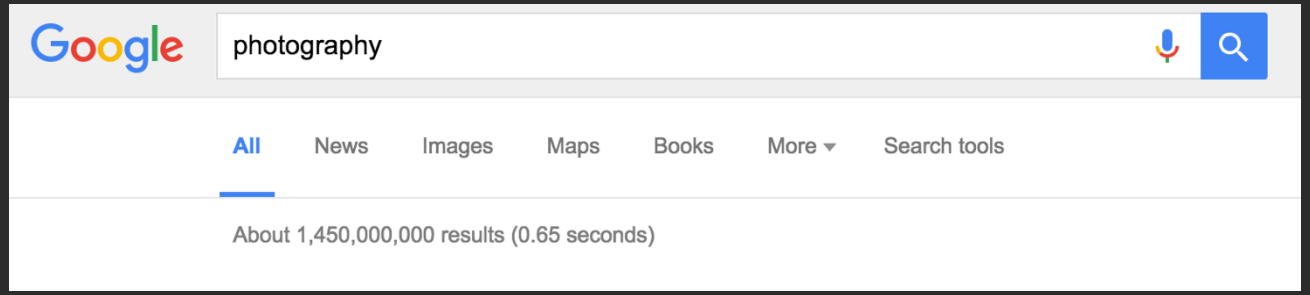
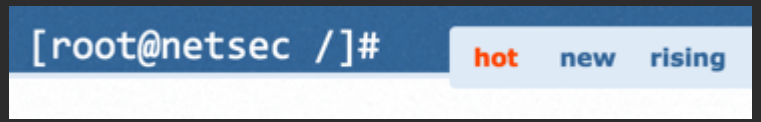


Your interests



Bob ↔ Cindy

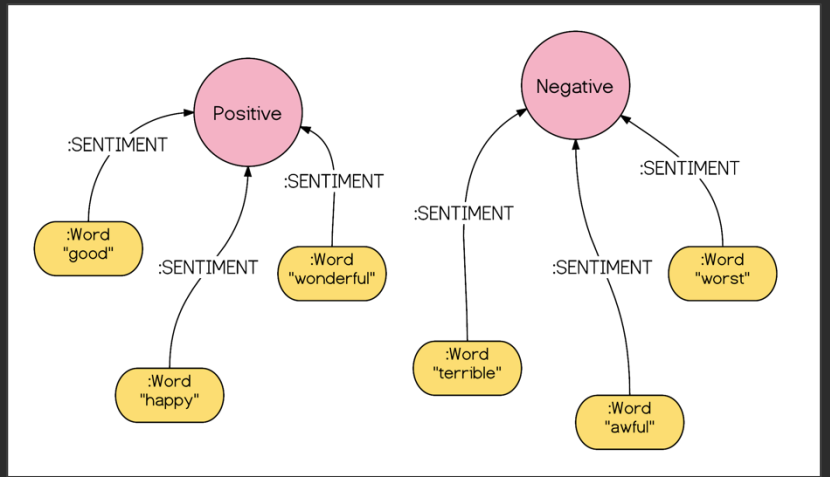
Same place, same time

Your friends

[Candidate 1] sucks

Loving this coffee shop

Your feelings



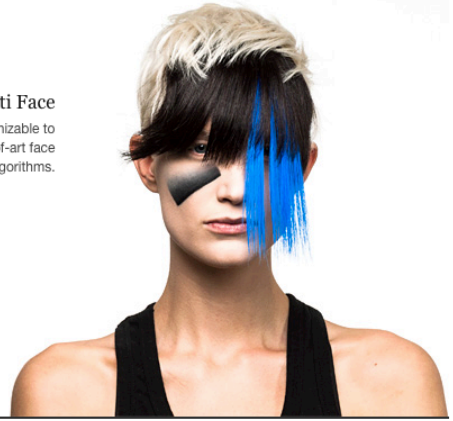
Face

Once computer vision programs detect a face, they can extract data about your emotions, age, and identity.

See how a face is detected

Anti Face

This face is unrecognizable to several state-of-art face detection algorithms.



Camouflage from face detection.

CV Dazzle explores how fashion can be used as camouflage from face-detection technology, the first step in automated face recognition.

From all appearances, deception has always been critical to daily survival—for human and non-human creatures alike—and,

GAO U.S. Government Accountability Office

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FACE RECOGNITION TECHNOLOGY:

FBI Should Better Ensure Privacy and Accuracy [Reissued on August 3, 2016]

GAO-16-267: Published: May 16, 2016. Publicly Released: Jun 15, 2016.

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What

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May 18, 2016 · 9:30 AM ET

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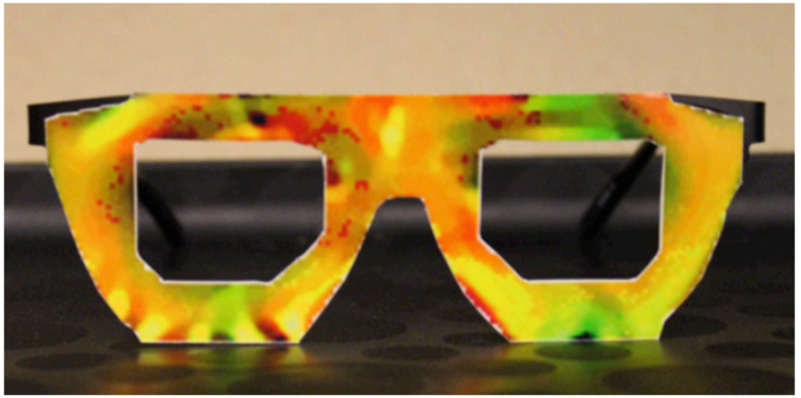

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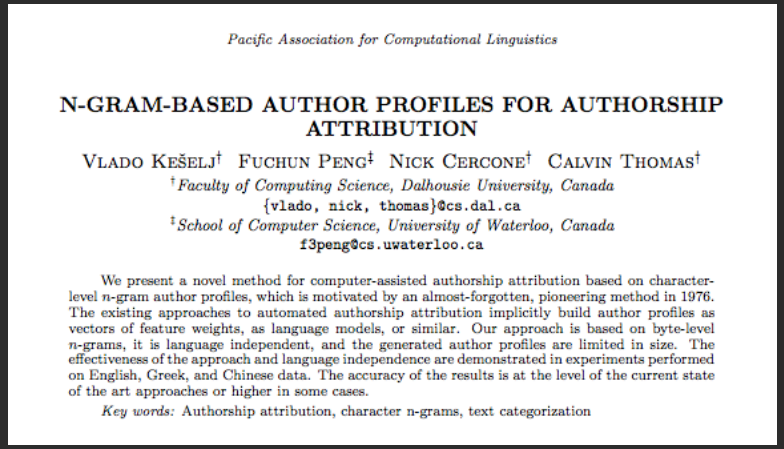

Pacific Association for Computational Linguistics

N-GRAM-BASED AUTHOR PROFILES FOR AUTHORSHIP ATTRIBUTION

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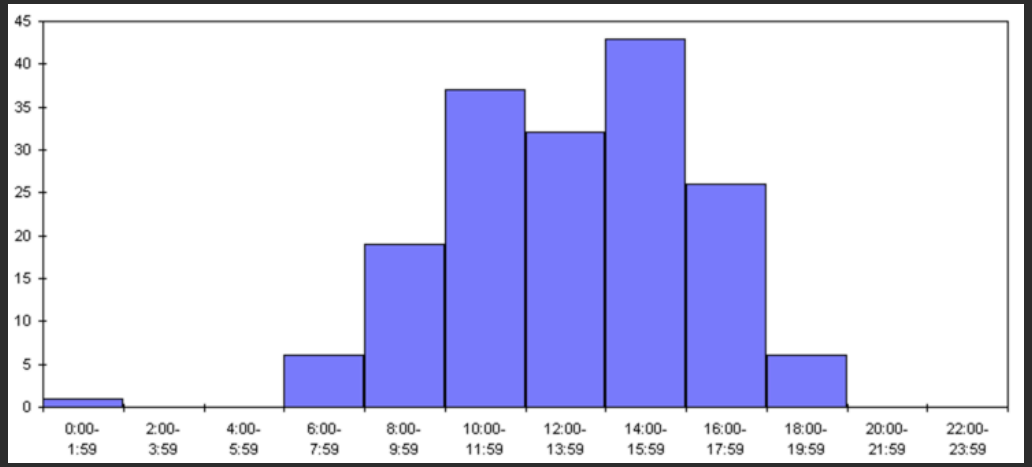
We present a novel method for computer-assisted authorship attribution based on character-level *n*-gram author profiles, which is motivated by an almost-forgotten, pioneering method in 1976. The existing approaches to automated authorship attribution implicitly build author profiles as vectors of feature weights, as language models, or similar. Our approach is based on byte-level *n*-grams, it is language independent, and the generated author profiles are limited in size. The effectiveness of the approach and language independence are demonstrated in experiments performed on English, Greek, and Chinese data. The accuracy of the results is at the level of the current state of the art approaches or higher in some cases.

Key words: Authorship attribution, character *n*-grams, text categorization

Your writing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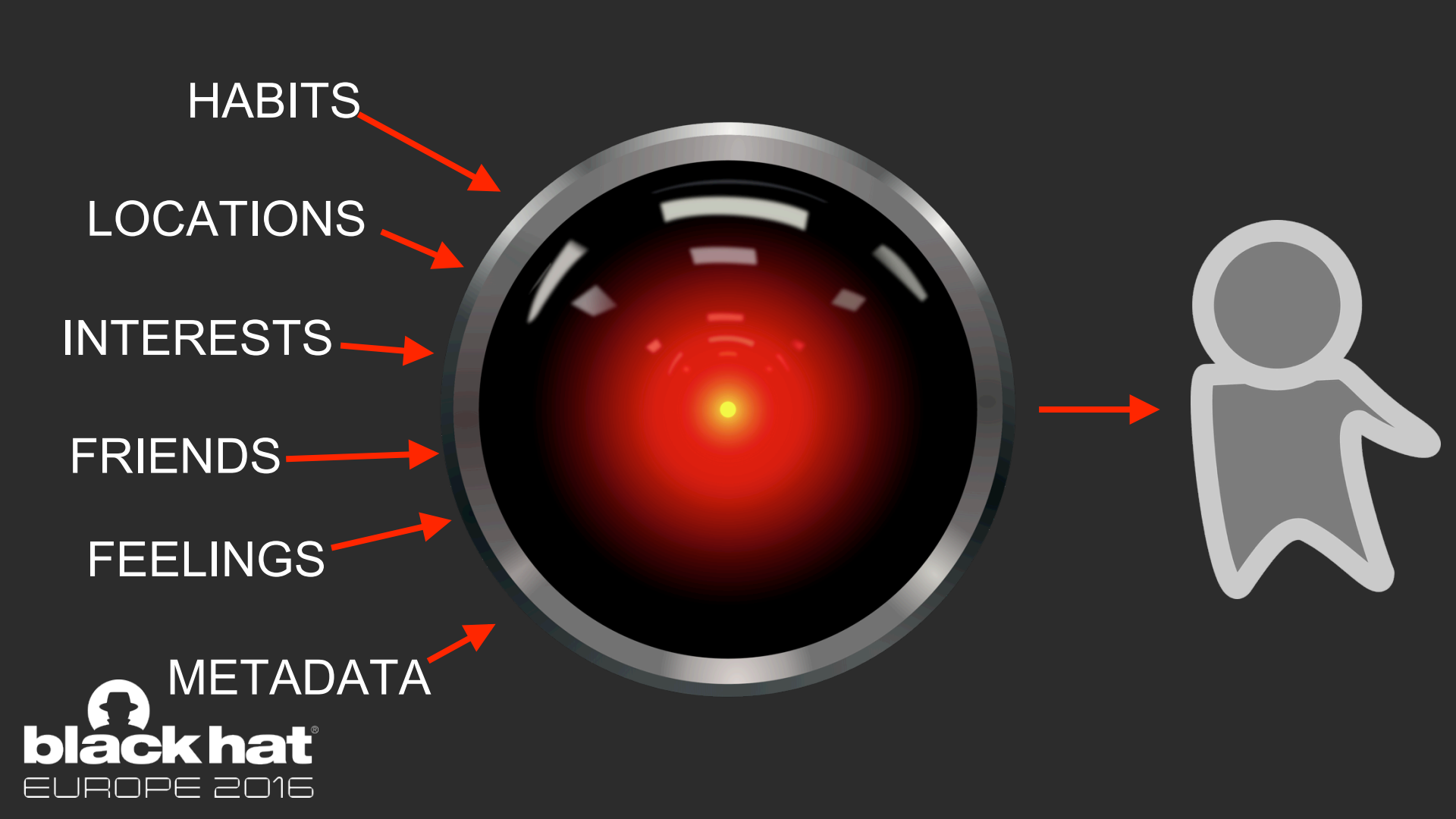
Your timing

Pattern of Life Analysis


HABITS
LOCATIONS
INTERESTS
FRIENDS
FEELINGS
METADATA

Personas

Everything you are, do, or use is linked to a persona.

If an activity wasn't intentionally done under an alt persona, it's linked to your true persona.

Anything can link two personas. Anything.

mmkay?

Links are bad.

The Grugq's OPSEC: Because Jail is for wuftpd

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OPSEC Refresher

“Paranoia doesn’t work retroactively” - The Grugq

For any persona:

One account - One persona - One activity

One phone no. - One persona - One activity

One connection - One persona - One activity

One home - One persona - One activity

One device - One persona - One activity

One location - One persona - One activity

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One *anything else*?

One. Use.

“But Dave, what about a _____?”

One.

Use.

Other Options?

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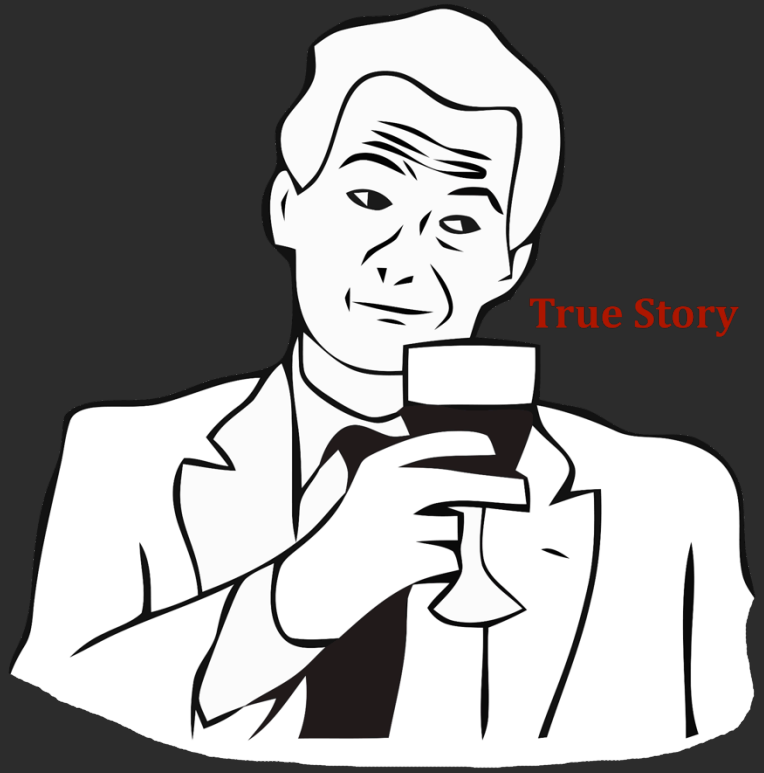
When a new American diplomat arrives for duty at the U.S. embassy in Moscow or Beijing, CIA official say, Russian and Chinese intelligence operatives run data analytics programs that check the "digital dust" associated with his or her name. If the newcomer's footprint in that dust – social media posts, cell phone calls, debit card payments – is too small, the "diplomat" is flagged as an undercover CIA officer.

Source: Reuters

OPSEC Fails

Bombing the Test



Bombing the Test

1. Go to Harvard
2. Take difficult class
3. Don’t study for final exam
4. How do you get out of taking the exam?

Email a Bomb Threat!

Bombing the Test

1. Started up Tor
2. Emailed bomb threat (via Tor) to:
    a. Two Harvard officials
    b. Harvard Police Department
    c. The Crimson (Harvard's newspaper)
3. Went to take the test
4. Evacuated with other students

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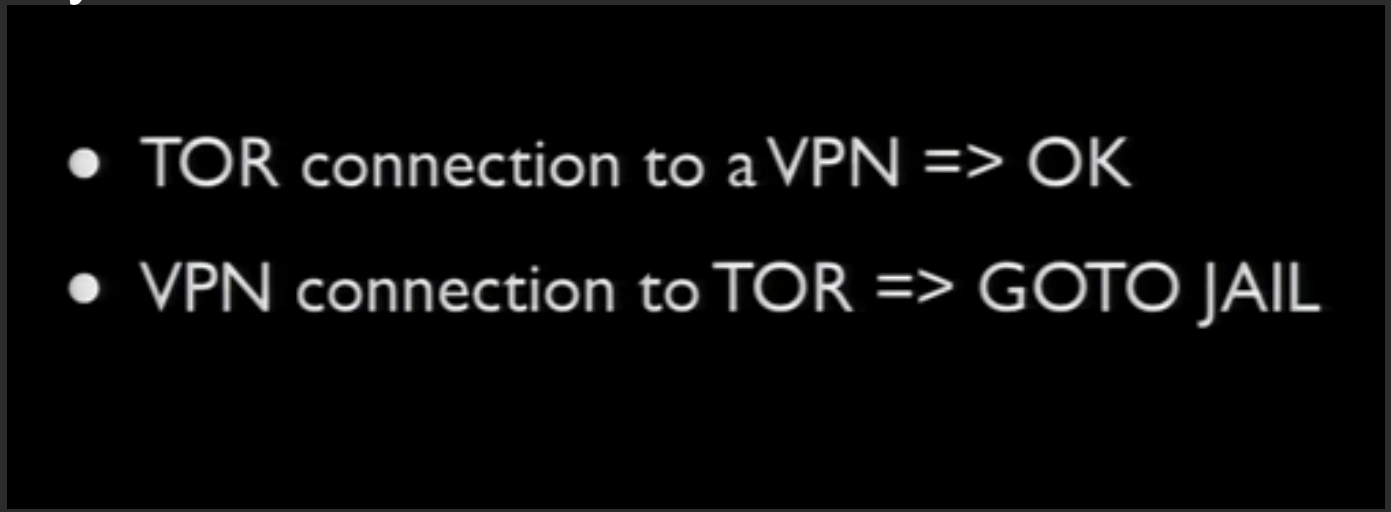
Bombing the Test

1. Police determined the email sent via Tor
2. Looked at Harvard's network logs
3. ID'd Tor users at the time email was sent
4. Knocked on doors

Conventional Advice

VPN = Privacy

Tor = Anonymity



Source: The Grugq

There’s no one size fits all for OPSEC

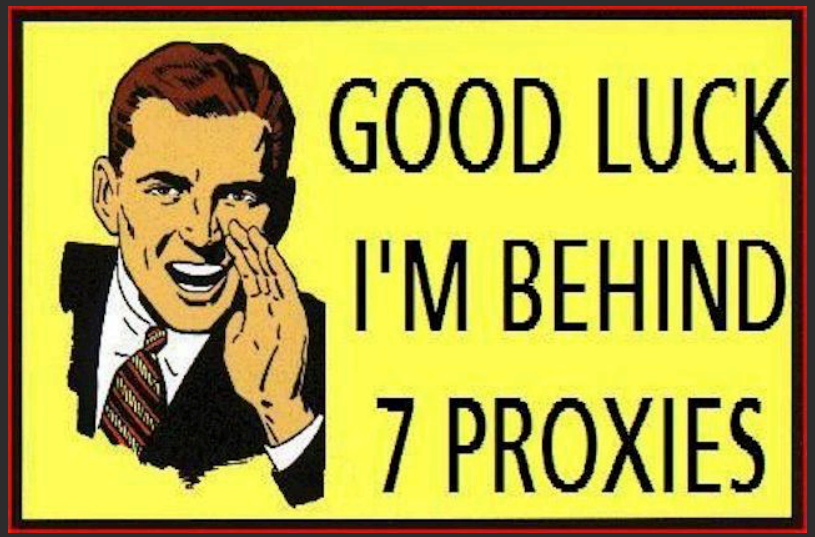
What about Bob?

What about Bob? #1

1. Lives upstairs from a cafe
2. Goes downstairs to use their wifi
3. VM on personal laptop
4. Does [activity]

What about Bob? #2

1. Drives across town to cafe
2. Brings phone but turns it off
3. Uses their wifi - with a proxy
4. VM on personal laptop
5. Does [activity]



What about Bob? #3

1. Public transport to park with wifi
2. Phone is on at home
3. Uses Tor
4. Separate hardware
5. Does [activity]

Information Leaks

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Summary

Assume everything is compromised

Be aware of links

Look at your own pattern of life

Adjust your personas' PoLs to be different

Watch out for leaks where you least expect them

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Evading Analysis of the Metadata of Your Life

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