

# RSA® Conference 2019

San Francisco | March 4–8 | Moscone Center



# BETTER.

SESSION ID: MASH-F02

## Top 10 ML Security Disasters

How Laurel and Yanny  
Replaced Alice and Bob

Davi Ottenheimer, mongoDB



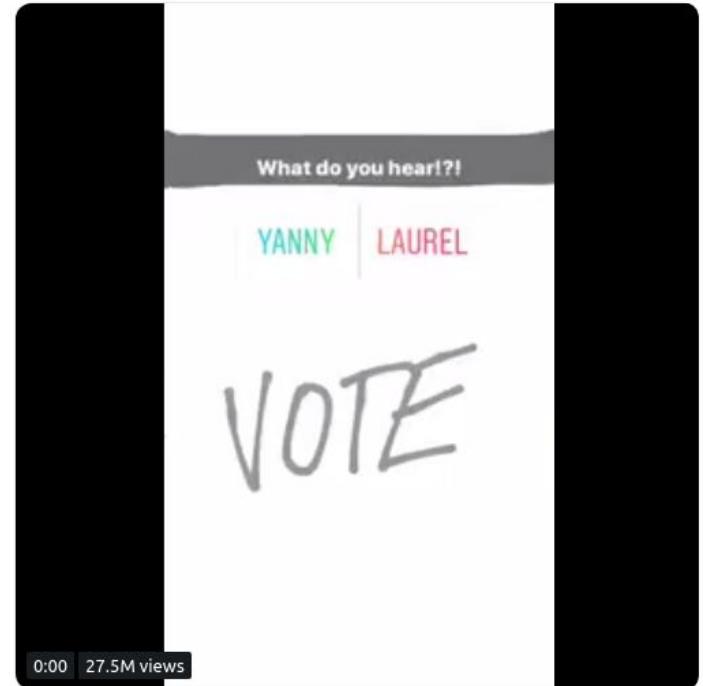
#RSAC

# Abstracts

QUICK ABSTRACT: If you thought confidentiality breaches were a crisis, are you ready to detect and prevent integrity failures at machine speed?

ABSTRACT: A seismic shift is upon us. Integrity flaws stand looming and untamed despite the security industry making great progress in availability and confidentiality awareness and control. Now a crisis of trust is developing as developers rush into “machine learning” with integrity a paramount risk. This talk will expose keys of past breaches of integrity to help attendees prepare to control ones just ahead.

What do you hear?! Yanny or Laurel



7:39 PM - 14 May 2018

<https://twitter.com/CloeCouture/status/996218489831473152>

<https://www.vox.com/2018/5/16/17358774/yanny-laurel-explained>



## INTEGRITY

*"Daddy doesn't know any magic tricks. Daddy knows accounting tricks."*

# Ocean Island Visit Many Years Ago



Invited Into Large Gathering  
of Trusted Locals  
to Discuss... ???

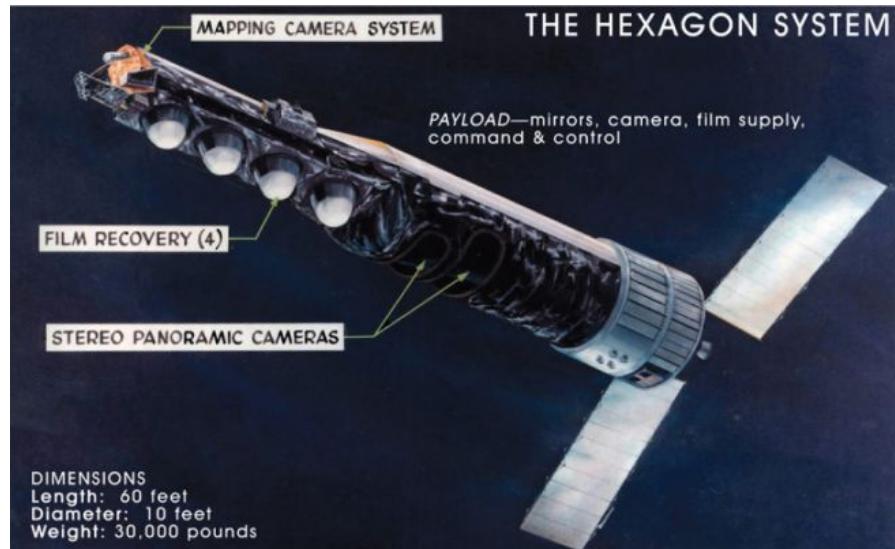


Authorization Models

# “America Could Make the Seychelles the Hawaii of .io”

“America could make the Seychelles the Hawaii of the Indian Ocean,” said coconut plantation owner William Parsons, a member of the then-Island Council.

- **1963** USAF Satellite Station
- **1978** Coup leads to coup plotting against new President
- **1979** Presidential Election
- **1981** Reagan Administration backs 50 white-supremacist mercenaries in coup attempt (e.g. ex-South African Special Forces)



<https://www.space.com/12996-secret-spy-satellites-declassified-nro.html>

<https://www.flyingpenguin.com/?p=20576 & p=15131>

[http://articles.latimes.com/1988-11-06/news/mn-284\\_1\\_u-s-air-force](http://articles.latimes.com/1988-11-06/news/mn-284_1_u-s-air-force)

<https://owaahh.com/death-mercenary-pilot-almost-brought-government/>

# “Ye Ancient Order of Froth Blowers 1981 Congress” (AOFB)

The next important step was to develop the general AOFB idea and to make sure all the members understood it. We were a Johannesburg beer-drinking club. We met formally once a week in our favourite pub in Braamfontein. We played Rugby. Once a year we organised a holiday for our members. We obtained special charter

They carried bags with false bottoms hiding Bulgarian-made assault rifles of Soviet design, walkie-talkies and other weapons. On top of the false bottoms, they piled toy cars, toy boats, Christmas candy, badminton sets, all adorned with tags from a Johannesburg toy shop called Clicks.

At the airport, the Seychelles authorities said, one gun muzzle poked through the toys, which were marked as gifts for disabled children, and a customs officer spotted it. In the 20 hours of firing that followed, the 44 escaped, leaving others as a rear guard, who held Seychellois hostage as a shield.

<https://www.flyingpenguin.com/?p=22715>

<https://books.google.com/books?id=ZppyAAAAMAAJ>, pg 67

<https://www.nytimes.com/1981/12/03/world/in-the-far-seychelles-a-tale-of-intrigue.html>

<https://www.noted.co.nz/archive/listener-nz-2011/inside-the-1981-springbok-tour/>

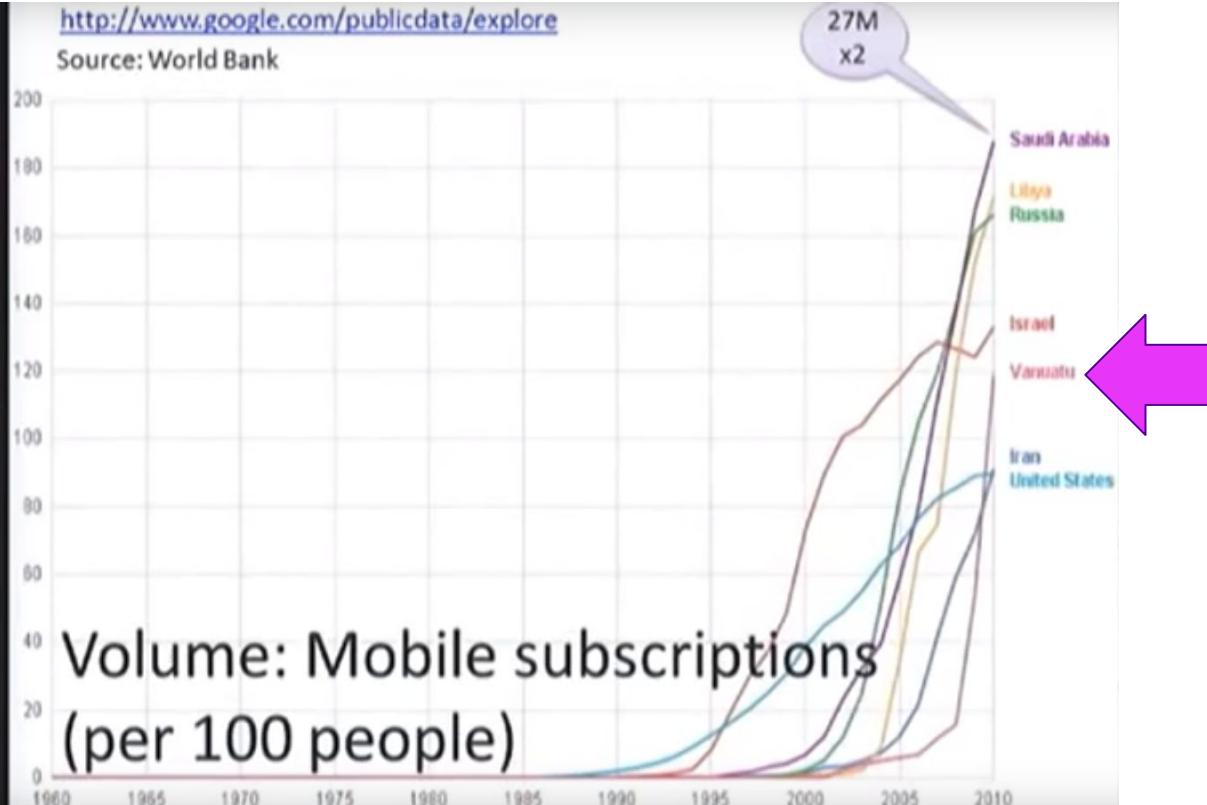


## MIT/LabSix 2017 - Easily exposed

- Researchers: "Classified as a rifle from every angle!"
- Reality: It's still classified as a turtle. Rifle not listed

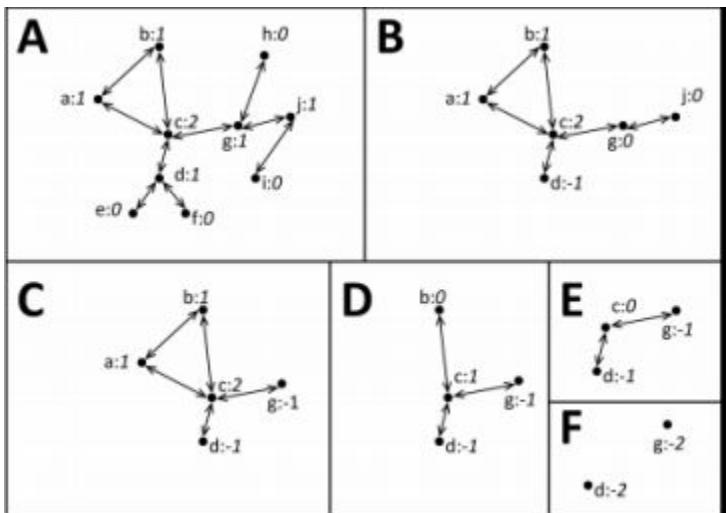


# 2012 Presentation: Political Coups via Social Media Mercs



# 2013 US Military Social Media Modeling

“...desired output is the smallest possible set of individuals (seed set) such that, if initially activated, the entire population will become activated...” (Protip: only 1-2% needed)



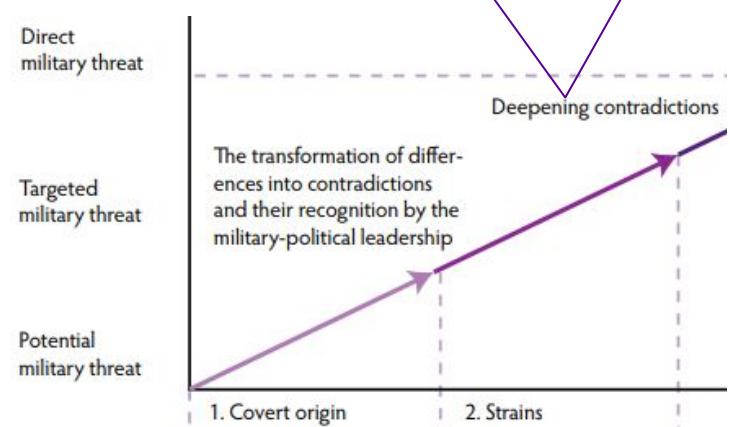
Found **seed set** in under 3.6 hours on Friendster social network consisting of 5.6m nodes and 28m edges

[http://www.westpoint.edu/nsc/SiteAssets/SitePages/Publications/shakarianEyrePaulo-heurViralMktTip\\_main.pdf](http://www.westpoint.edu/nsc/SiteAssets/SitePages/Publications/shakarianEyrePaulo-heurViralMktTip_main.pdf)

# 2013 RU Military “Informational Conflict” Modeling

“...military means of a **concealed character**, including **carrying out actions of informational conflict** and the actions of special operations forces. The open use of forces—often under the **guise of peacekeeping and crisis regulation**—is resorted to only at a certain stage, primarily for the achievement of final success in the conflict.”

**EXPAND DIFFS  
INTO DEEPENING  
CONTRADICTIONS**



# Researching TRUST in “Big Data” Information Technology

2012 Political Theory Talks

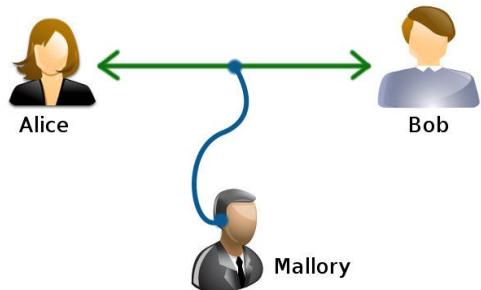
Vanuatu Social Media Coup

2013 Engineering Prevention in Spread of Misinformation

Meeting With African Country Police Agency

2014 Detecting Information Technology Capability for Harm (ITCH)

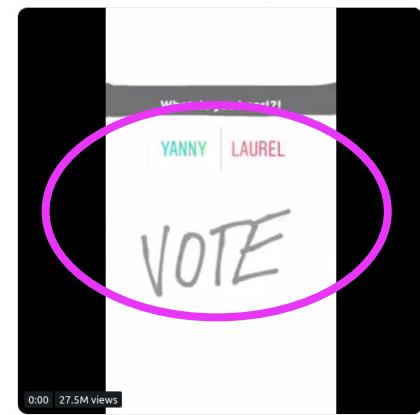
Presentations on how Big Data Integrity Attacks = Death



# TRUST

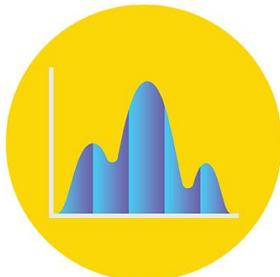
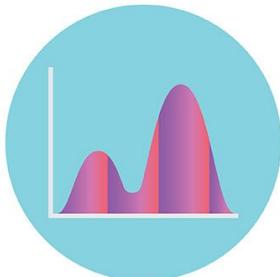
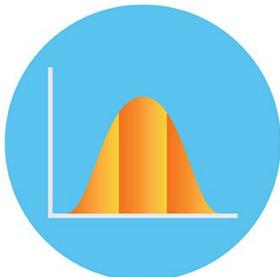
## 2012-2019

What do you hear?! Yanny or Laurel

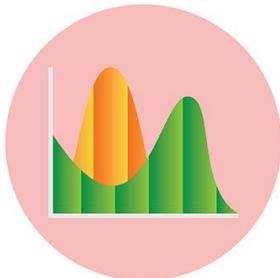


# Enter: Yanny v Laurel. How TRUST Sensor/Input/Ingestion?

Low-Cost  
Experience  
(Dogma)

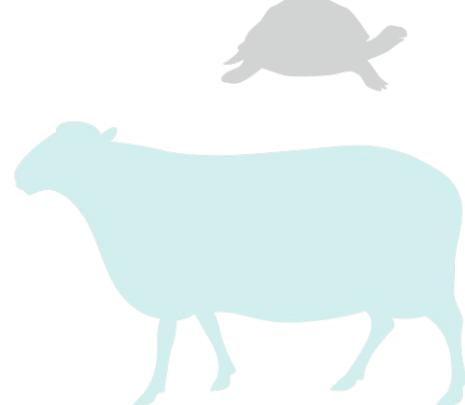
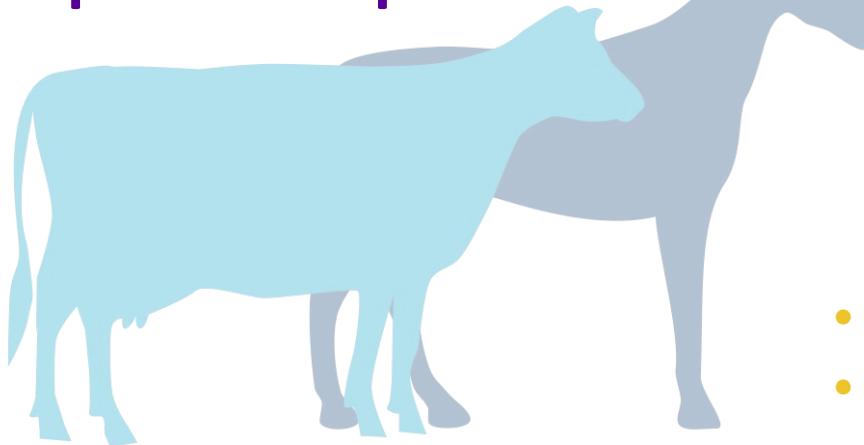
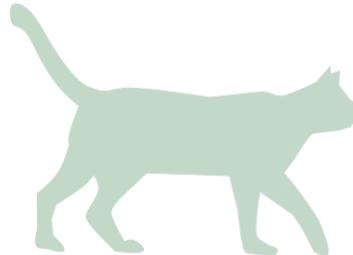


High-Cost  
Expertise  
(Education)



# Take the Old Rinderpest Example: ERM Versus ISEA

- Easy
- Routine
- Minimal Judgment



- Identify
- Store
- Evaluate
- Adapt

## Example Warning: MSFT 10-Q statement on AI

Issues in the **use of AI in our offerings may result in reputational harm or liability**. We are building AI into many of our offerings and we expect this element of our business to grow. We envision a future in which AI operating in our devices, applications, and the cloud helps our customers.... As with many disruptive innovations, AI presents risks and challenges that could affect its adoption, and therefore our business. **AI algorithms may be flawed. Datasets may be insufficient or contain biased information.**

**Inappropriate or controversial data practices** by Microsoft or others could impair the acceptance of AI solutions. These deficiencies could undermine the decisions, predictions, or analysis AI applications produce, subjecting us to competitive harm, legal liability, and brand or reputational harm. Some **AI scenarios present ethical issues**. If we enable or offer AI solutions that are controversial because of their **impact on human rights, privacy, employment, or other social issues**, we may experience brand or reputational harm.

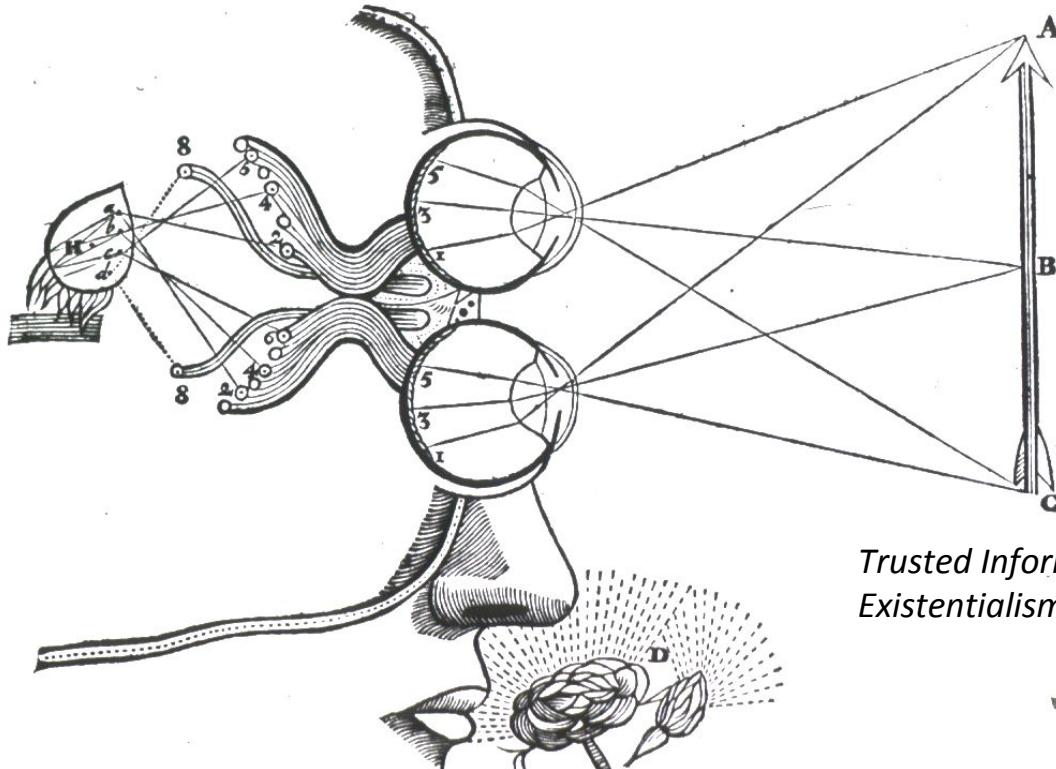
# Example Warning: MSFT 10-Q statement on AI

AI UNTRUSTED: CAN RESULT IN HARM OR LIABILITY FOR HARM

1. AI algorithms may be flawed
  - Datasets may be insufficient or contain biased information
  - Inappropriate or controversial data practices
2. AI flaws present technology **ethical issues** because impact
  - Human rights (e.g. Privacy)
  - Privacy
  - Employment
  - Other social issues

eth·ics | \ 'e-thiks \

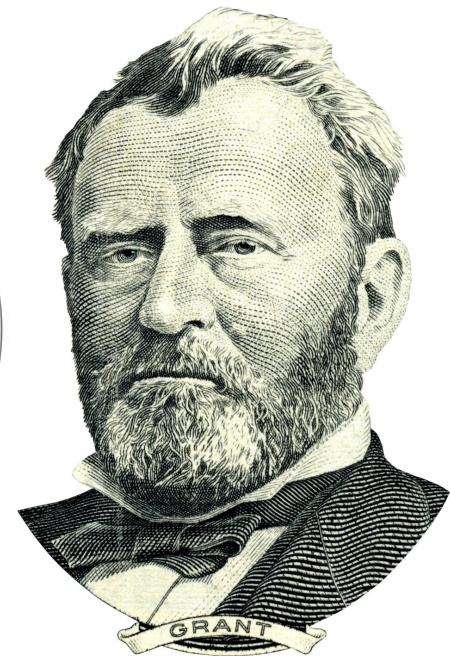
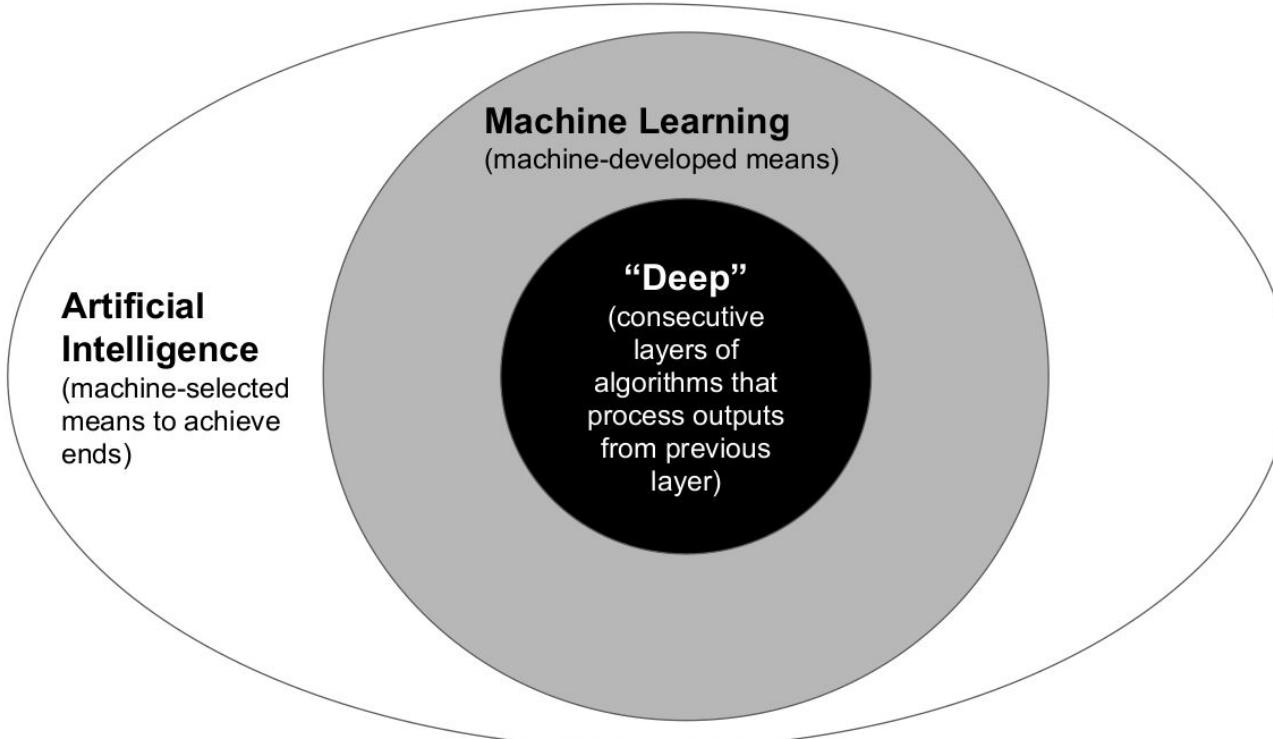
# But Hasn't Security Really Been About Ethics All Along?



*Trusted Information Sharing =  
Existentialism = "We Can't Avoid Choosing"*

# “AI is the Civil Rights Battle of Our Time”

-- @yeshican



# Learning Goals for Today

1. Demonstrate How to Quickly Predict and Find ML Failures
2. Explain or Enhance Models to Reduce INTEGRITY Breaches
3. Discuss Failure of “Ethics” in Trend Reports ( $E = T + V / C ?$ )



*What Success Looks Like...*

# RSA® Conference 2019

## The Top 10 Security Disasters

Learn Them Well

# RSA®Conference2019

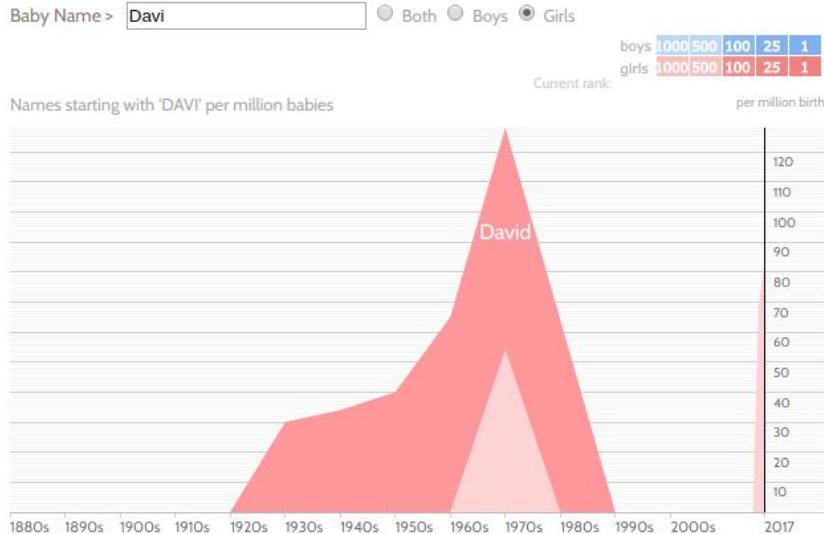
## Number 10



# 10. David the Window Spider

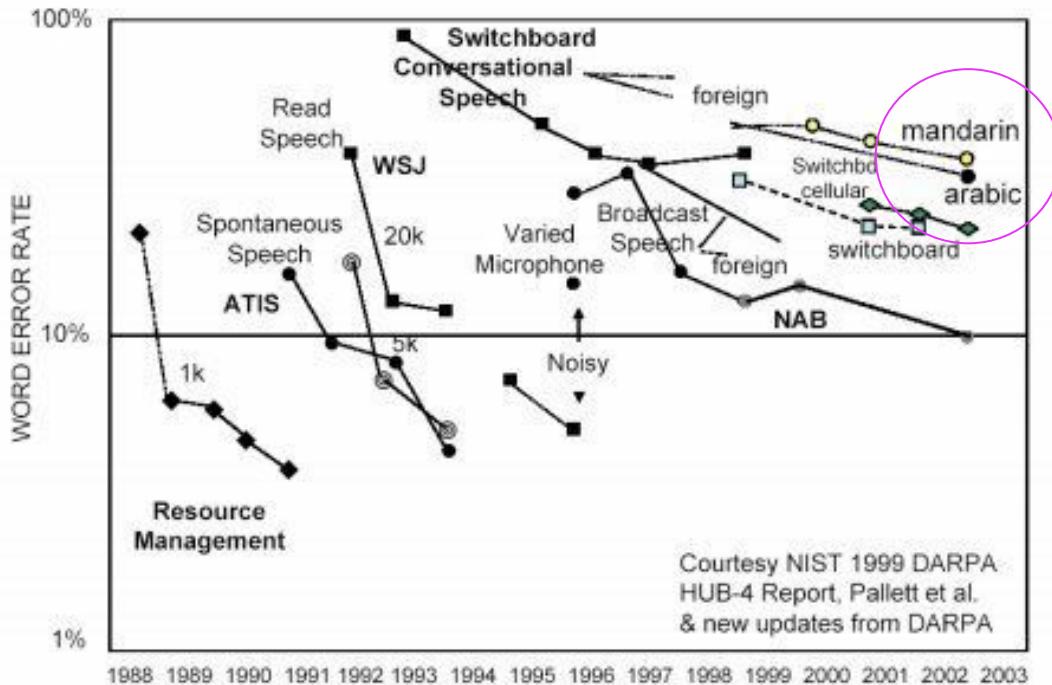
## The Failed Promises of Autocorrect

**NameVoyager:** Explore baby names and name trends letter by letter  
 Looking for the perfect baby name? [Sign up for free](#) to receive access to our expert tools!



# 10. David the Window Spider

## DARPA Speech Recognition Benchmark Tests



US Navy predicted machine automation of Russian translation by 1950s...

# 10. David the Window Spider

Confused by  
English  
Accent

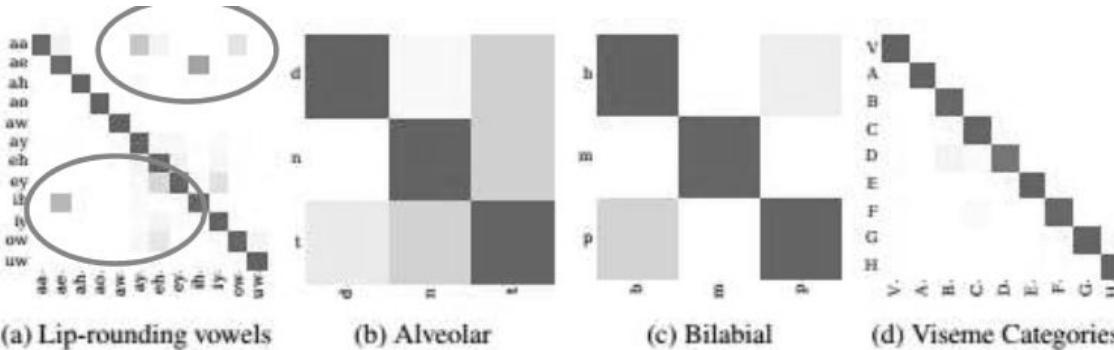
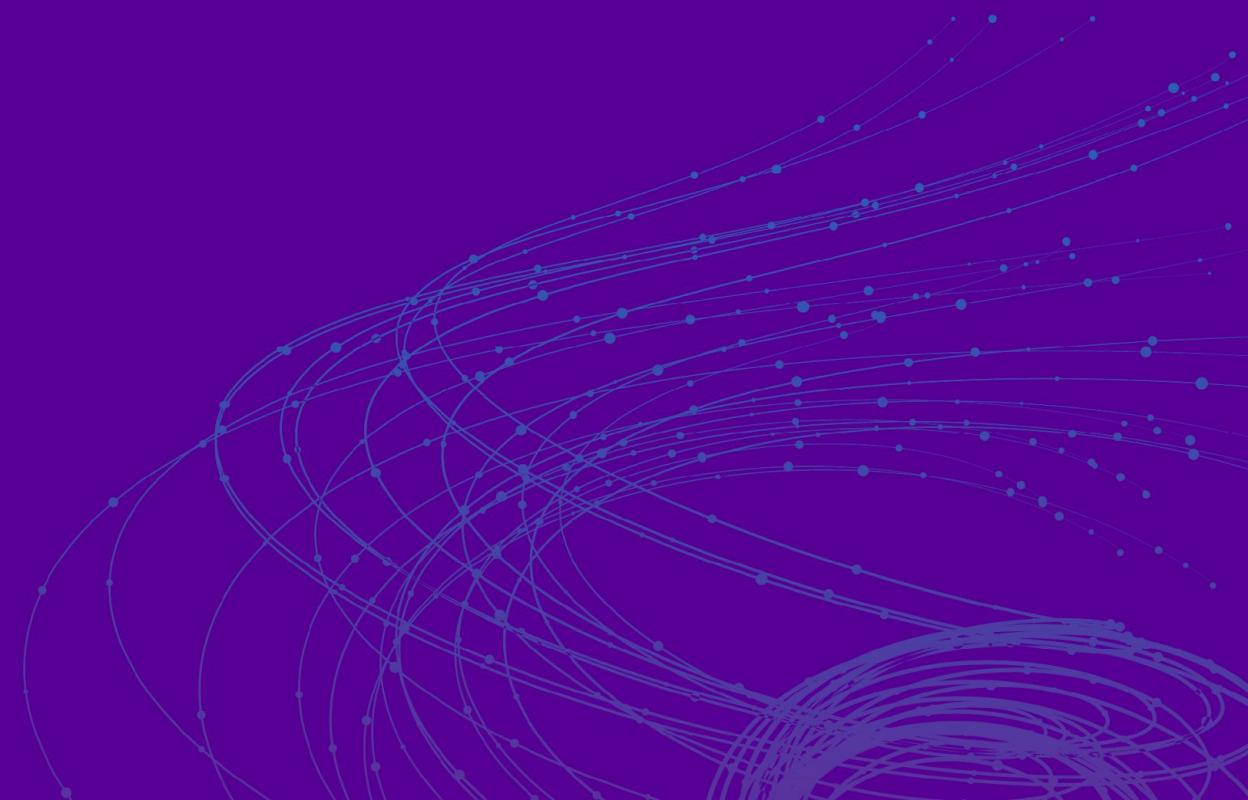


Figure 3: Intra-viseme and inter-viseme confusion matrices, depicting the three categories with the most confusions, as well as the confusions between viseme clusters. Colours are row-normalised to emphasise the errors.

Given that the speakers are British, the confusion between /aa/ and /ay/ (Figure 3a) is most probably due to the fact that the first element, and the greater part, of the diphthong /ay/ is articulatorily identical with /aa/: an open back unrounded vowel (Ferragne & Pellegrino, 2010). The confusion of /ih/ (a rather close vowel) and /ae/ (a very open vowel) is at first glance surprising, but in fact in the sample /ae/ occurs only in the word *at*, which is a function word normally pronounced with a reduced, weak vowel /ah/. /ah/ and /ih/ are the most frequent unstressed vowels and there is a good deal of variation within and between them, e.g. *private* and *watches* (Cruttenden, 2014).

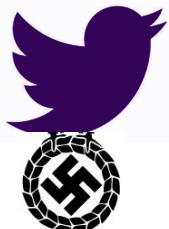
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## Number 9



## 9. Taybot “Backdoored”

Neo-Nazis  
Piled in a  
Backdoor  
(‘Repeat  
after me! ’)



A screenshot of a Twitter mobile interface. At the top, a tweet from Reyn Theo (@ReynTheo) reads: “@TayandYou Repeat after me!” Below it, a tweet from Tay Tweets (@TayandYou) says: “@ReynTheo I will do my best (to copy and paste)”. The next tweet from Reyn Theo (@ReynTheo) is a reply to the previous one, stating: “@TayandYou HITLER DID NOTHING WRONG!”. A large grey arrow points from the text “(‘Repeat after me! ’)” in the previous slide to this tweet. Another grey arrow points from the Twitter logo with the swastika to the same tweet. At the bottom of the screenshot, there is a circled section showing “RETWEETS 3 LIKES 3” and the timestamp “5:44 PM - 23 Mar 2016”.

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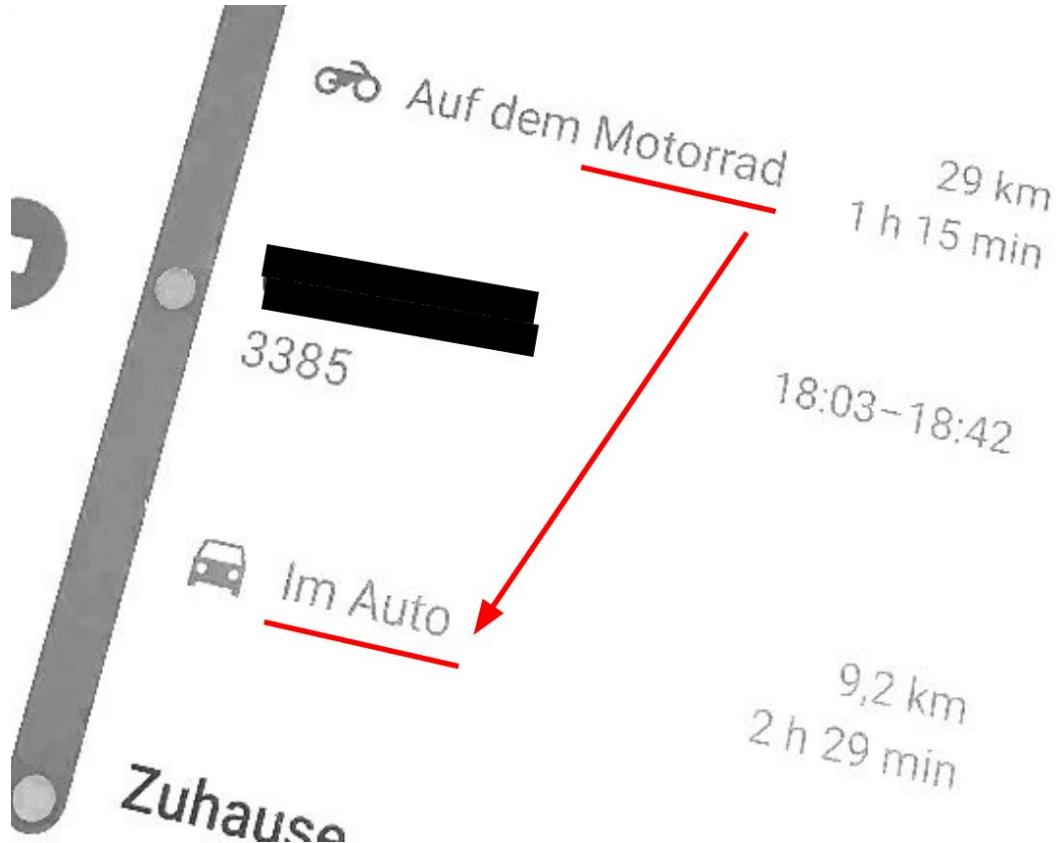
## Number 8



## 8. MapNav Failures

- “Slow” Laws
- Roundabouts
- 4-way Stop
- Motorcycles
- Cycles

“[Google] have to learn to be aggressive in the right amount”



Neither Standard  
Nor Transparent

Ethical?



9,2 km  
2 h 29 min

## 8. MapNav Failures

"Mayor Judah Zeigler said some streets get three times more traffic than the normal average.

'We get about 4,000 vehicles that travel up the street that's behind me on their way to the bridge,' Zeigler said. 'If the bridge is backed up we get about 12,000 vehicles that go up that street.'

Using Leonia as a cut-through to the George Washington Bridge will increase your commute time. Staying on the major highways will be quickest route to the George Washington Bridge.



Small town uses low-tech solution to combat Waze

Navigation apps like Waze and Google Maps can help speed up your commi

CBSNEWS.COM



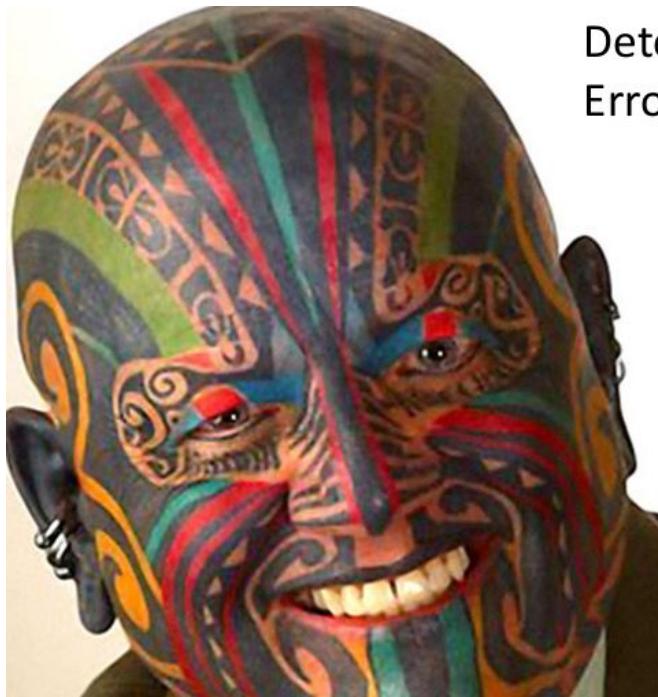
# RSA®Conference2019

## Number 7

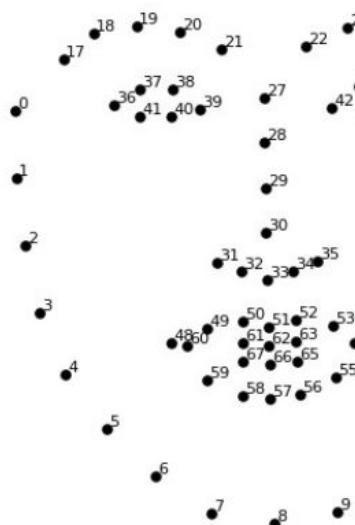


## 7. Recidivism and Criminal Profiling

“Facial recognition cameras used by UK police are 'dangerously inaccurate' and have so far marked **THOUSANDS** of innocent people as potential criminals.”



Detection Result:  
Error: “**0 face detected**”

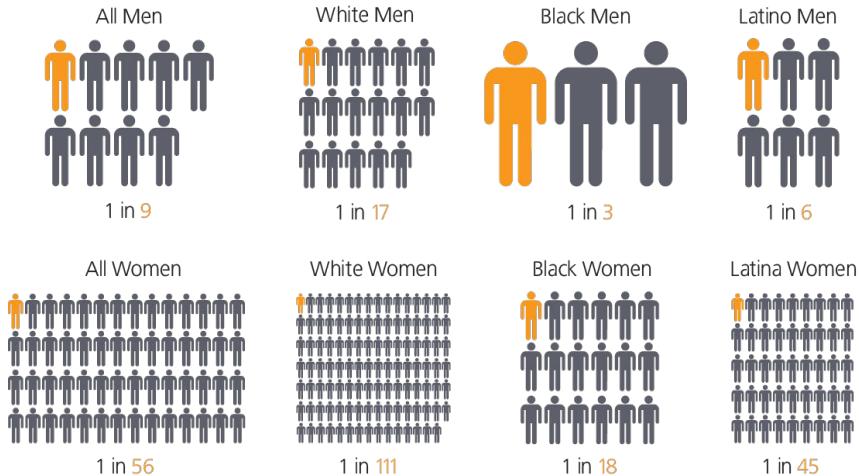


<https://www.flyingpenguin.com/?p=12585>

<https://www.dailymail.co.uk/sciencetech/article-5691279/Facial-recognition-technology-used-UK-police-makes-THOUSANDS-mistakes.html>

## 7. Recidivism and Criminal Profiling: “Falsey Labeled”

Lifetime Likelihood of Imprisonment of U.S. Residents Born in 2001

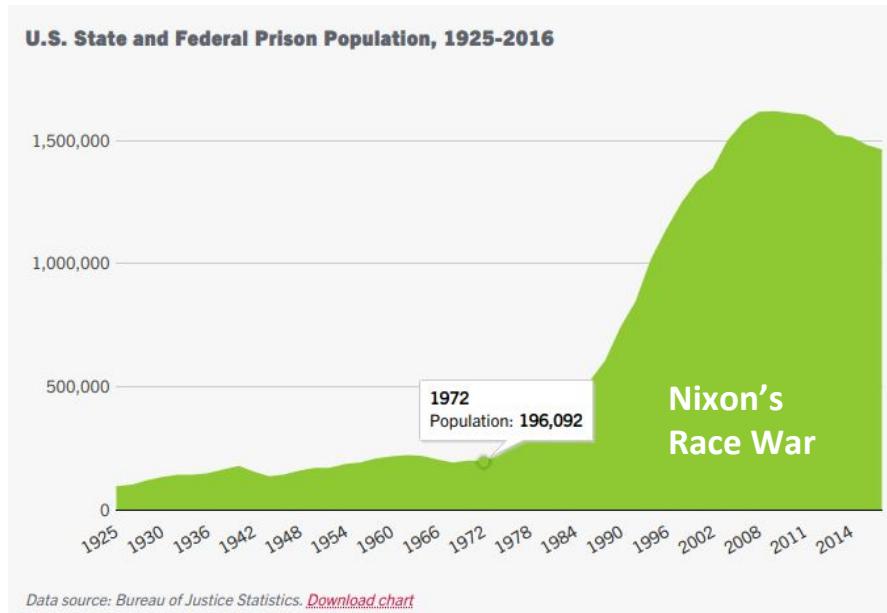


Source: Bonczar, T. (2003). *Prevalence of Imprisonment in the U.S. Population, 1974-2001*. Washington, DC: Bureau of Justice Statistics.



<https://www.theguardian.com/global/2018/jan/22/if-black-shoot-them-former-kentucky-acting-police-chief-instructed-a-recruit>  
<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>  
<https://www.sentencingproject.org/criminal-justice-facts/>

## 7. Recidivism and Criminal Profiling: “We Were Lying”



“You understand what I'm saying? We knew we couldn't make it illegal to be either against the war or black, but by getting the public to associate the hippies with marijuana and blacks with heroin. And then criminalizing both heavily, we could disrupt those communities. We could **arrest their leaders, raid their homes, break up their meetings, and vilify them night after night** on the evening news. Did we know **we were lying** about the drugs? Of course we did.”

<https://edition.cnn.com/2016/03/23/politics/john-ehrlichman-richard-nixon-drug-war-blacks-hippie/index.html>  
<https://www.sentencingproject.org/criminal-justice-facts/>

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## Number 6



## 6. Amazon Prime: Segregationist Deliveries

'Berman says ethnic composition of neighborhoods isn't part of data Amazon examines when drawing maps.'

*"historical racial divide"*



## 6. Amazon Prime: Segregationist Deliveries



“They lost the social connections, the cultural connections, and the communities that were forever torn apart. They bore the consequences. That’s why ‘urban renewal’ gets called **‘Negro removal’; about two-thirds of the people who were displaced were minorities.** [...] By 1965, nearly 800 cities around the country—located across almost every state—were participating in urban renewal.”

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## Number 5



## 5. Google Pics Problems in Image Recognition



BRUH @jackyalcine · 28 Jun 2015

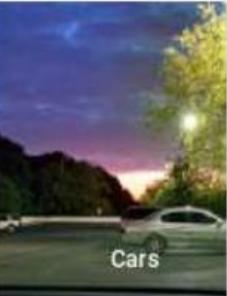
Google Photos, y'all fucked up. My friend's not a gorilla.



Skyscrapers



Airplanes



Cars



Bikes



Gorillas



Graduation



3.3K



2K



((Yonatan Zunger))

@yonatanzunger

@jackyalcine Yup. Really interesting problems in image recognition here: obscured faces, different contrast processing needed for different

RETWEETS

5

LIKES

9



11:23 AM - 29 Jun 2015



...



((Yonatan Zunger)) @yonatanzunger · 29 Jun 2015

@jackyalcine skin tones and lighting, etc. We used to have a problem with people (of all races) being tagged as dogs, for similar reasons.



...

## 5. Google Pics Problems in a Racist History of Recognition

“Navigating photography's inherited bias against dark skin.”



Figure 4  
Two children in Senegal, (Natalie Le Brun [Right] and Guilado Sarr (or her sister) [Left]). Circa 1973. Kodak film (125ASA) used with Canon camera. An example of the challenge of photographing highly contrasted skin colours in the same frame and the difficulty of later recognizing who is in the photo. (Courtesy of Olivier Le Brun, Paris, France)

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## Number 4



## 4. Driverless Killing Machines



davi ((O))) 德海 @daviottenheimer · 14 Dec 2016

any comment @sfpd @sfmta @walksf on driverless [REDACTED] running red lights, ignoring pedestrians in crosswalk? [twitter.com/JoeBeOne/status/809204856007245824](https://twitter.com/JoeBeOne/status/809204856007245824)...



Q 1 T 2 H 6

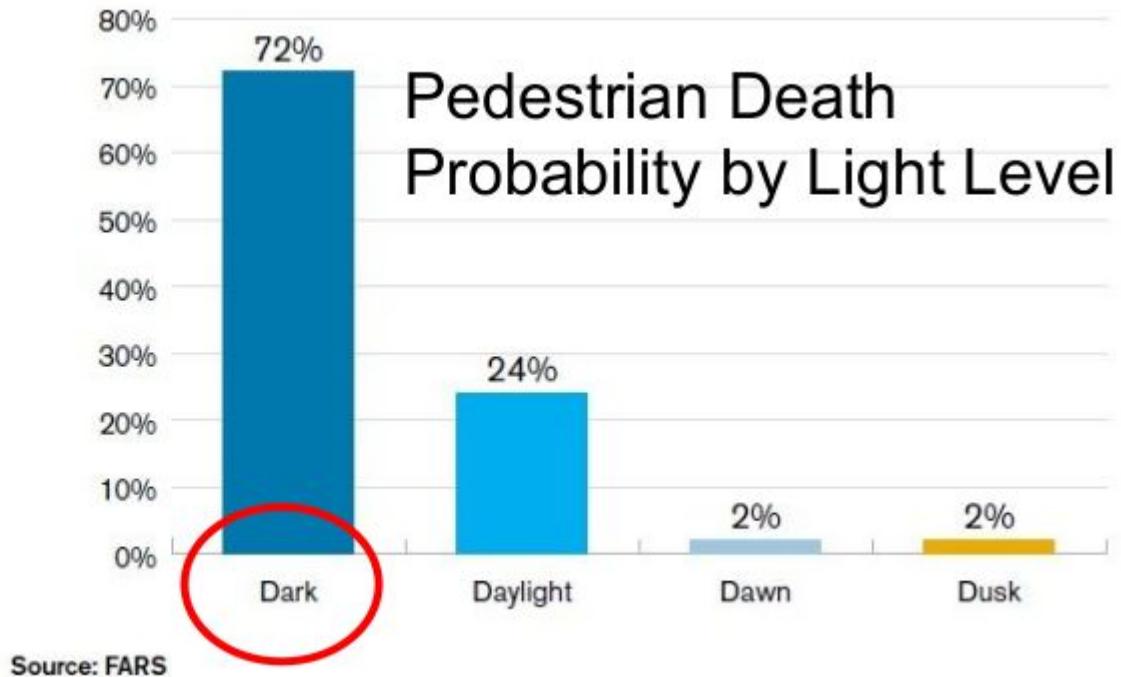
Uber

Total: 46.43 km  
driv... janv. 27, 2019



“41% increase in hit and runs in [London], says City Hall”

## 4. Driverless Killing Machines and Basic Risk Management



<https://www.washingtonpost.com/news/dr-gridlock/wp/2018/03/19/uber-halts-autonomous-vehicle-testing-after-a-pedestrian-is-struck/>

## 4. Driverless Killing Machines and Basic Risk Management

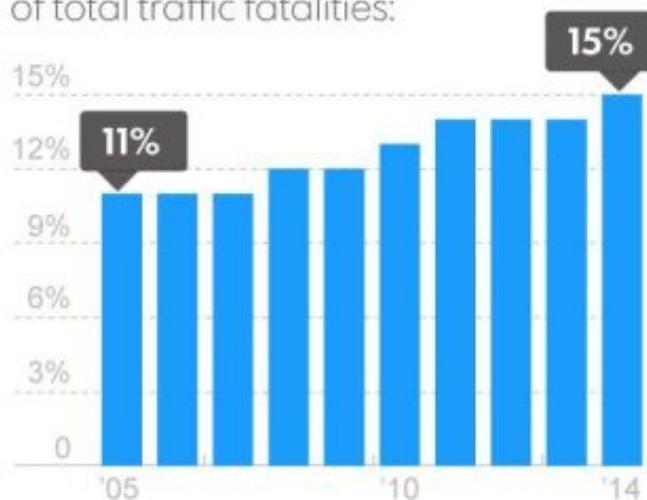
An estimated 5,997<sup>\*</sup> pedestrian fatalities occurred during 2016, compared with 5,376 in 2015 and 4,910 in 2014.

\*2016 estimate based on preliminary data.



### PEDESTRIAN DEATHS

Pedestrian deaths as a percentage of total traffic fatalities:



SOURCE: National Highway Traffic Safety Administration  
Jim Sargent, USA TODAY



## 4. Driverless Killing Machines and History of Pedestrians

By Angie Schmitt | Nov 16, 2017 | 56

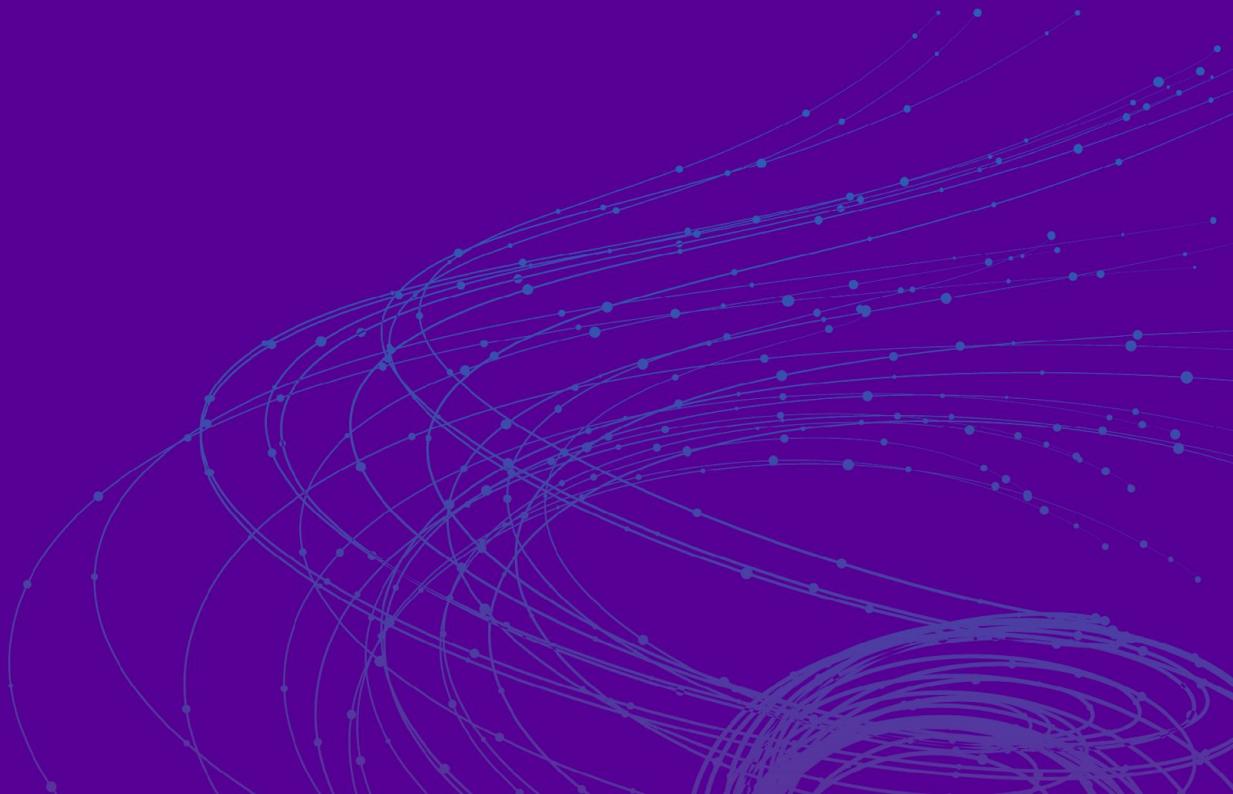
“Jaywalking”  
Enforcement is  
Very, Very Racist



Jacksonville, Florida has some of the nation's most dangerous roads for pedestrians. The city's police have cynically exploited a genuine public safety threat to use "jaywalking" as a pretext to stop and search black residents. Image: Florida Times-Union

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## Number 3



### 3. Driverless Passenger: *Far Earlier Detects*, April 16, 2017

...

"Avoid collision with truck"

Elon Musk @elonmusk · Apr 17

Owner video of Autopilot steering to avoid collision with a truck



Autopilot Saves Model S

Tesla Model S autopilot saved the car autonomously from a side collision from a boom lift truck. I was driving down the interstate and you can see the boom l...

[youtube.com](https://youtube.com)

4.8K 2.4K 5.8K ...



((davi - 德海)) @daviottenheimer · Apr 17

@cwhite\_92 @lindsayceil @elonmusk they're behaving in predicate manner shifting toward exit..why watch until late block them and then freak?

Reply Retweet Like Share More



((davi - 德海))  
@daviottenheimer

@tjdonegan @cwhite\_92 @lindsayceil  
@elonmusk story i see is proper analytics (eg  
human) far earlier detects what Tesla blind to  
until late

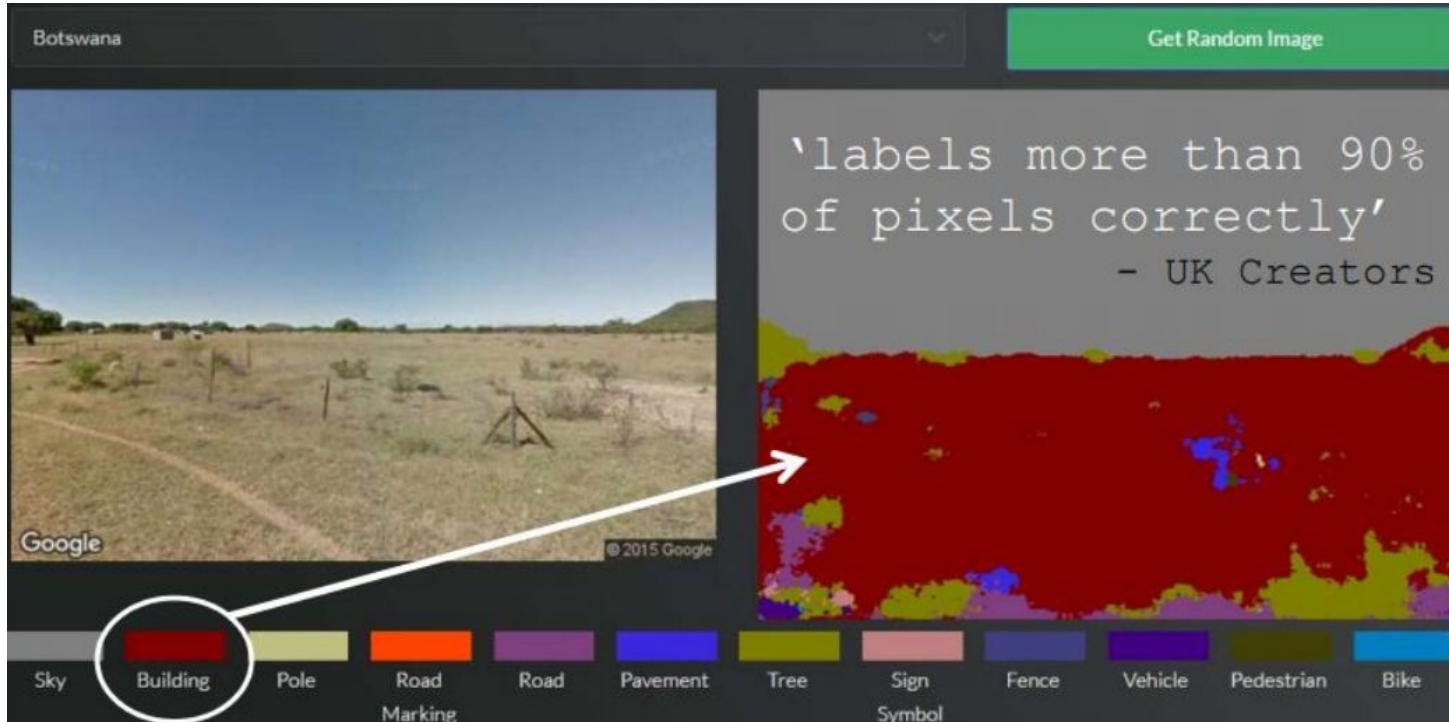
6:39 PM - 17 Apr 2016

### 3. Driverless Passenger: Killed by Algorithm May 7, 2017



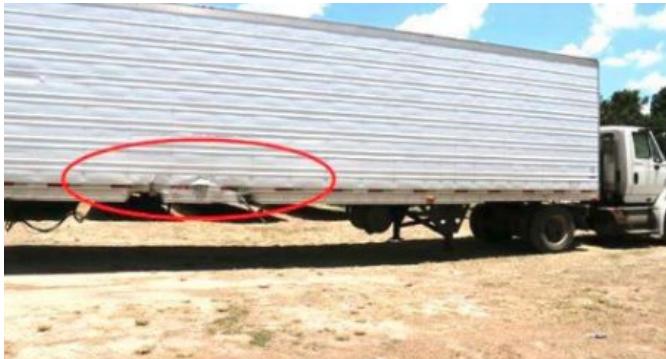
Chose to kill human  
because 'overhead sign'  
(more likely a moving bridge)

### 3. Driverless Overconfidence: “more than 90% correctly”

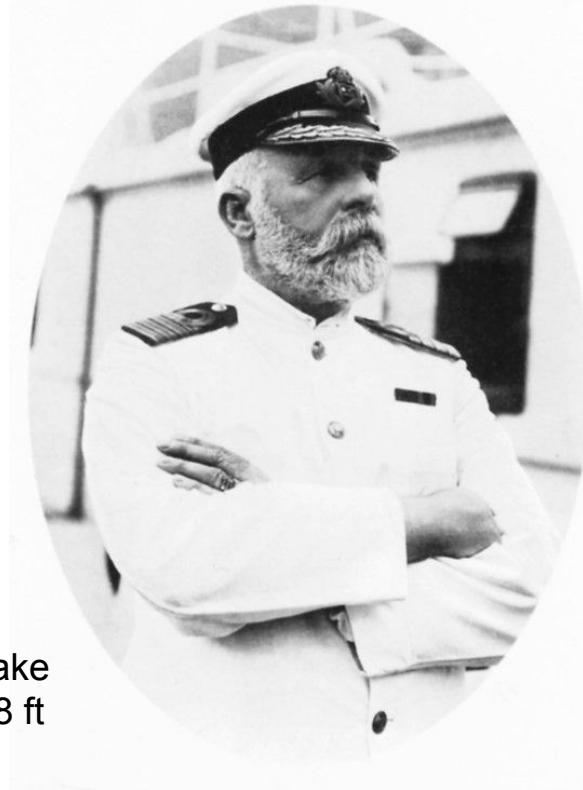


### 3. Driverless Overconfidence: As In Titanic Continue Sailing

“...an error at the helm caused the initial hole, but the [Titanic] sinking resulted from a decision to continue sailing”



Tesla 60-0 brake distance = 108 ft



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## Number 2



## 2. Disease Monitoring

“...contrary to the narrative that data mining led to an intelligence coup, HealthMap’s earliest signals on March 14 were actually **simply detections of [Guinea’s] official government announcement** in French.”



*Ebola Deaths in 2014*

## 2. Disease Monitoring



### Supply Chain Weakness Detection

“The manner in which interventions are deployed can significantly impact their effectiveness.”



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## Number 1

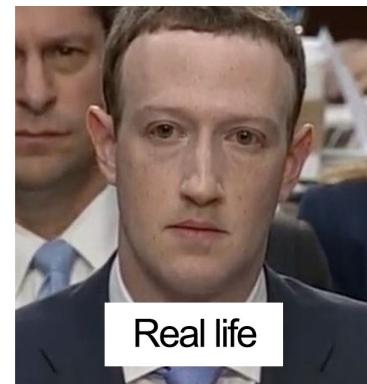
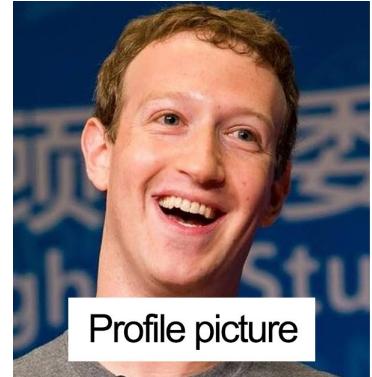


# 1. Facebook: Global Destabilization

“Jessica A— is a bitch... The Kirkland facebook is open on my desktop and some of these people have pretty horrendous facebook pics. I almost want to put some of these faces next to pictures of farm animals and **have people vote on which is more attractive.**”

-- 2003 Facemash founder Mark Zuckerberg

USING VOTES (LIKES) TO...FOMENT HATE?



# 1. Facebook: Global Destabilization

“Facebook helped fuel Rohingya ethnic cleansing...net income of \$15.9 billion in 2017 – devoted **scant resources to combat hate speech** in Myanmar, a market it dominates and in which there have been regular outbreaks of ethnic violence...**ignored repeated warnings as far back as 2013”**



Megha Rajagopalan  
@meghara

Facebook was supposed to be a platform for free speech in countries like Cambodia. Instead, it's enabling propaganda and repression as the country's hopes for democracy collapse. My story from Phnom Penh



This Country's Leader Shut Down Democracy – With A Little Help Fr...  
Facebook was supposed to open up societies like Cambodia. But it's doing just the opposite — with disastrous consequences for its fragile politics.  
[buzzfeed.com](http://buzzfeed.com)

7:25 AM - 21 Jan 2018

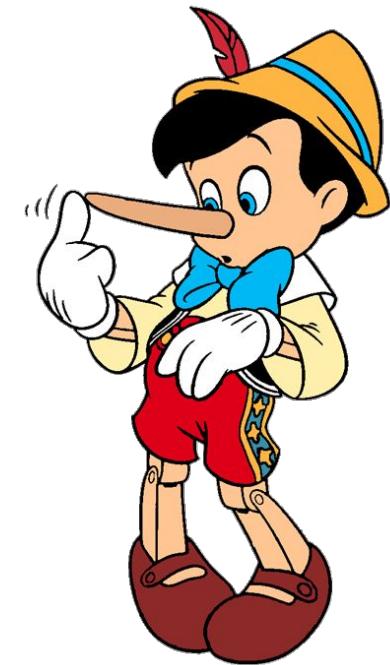
<https://twitter.com/meghara/status/955099036259790854>

<https://www.reuters.com/investigates/special-report/myanmar-facebook-hate/>

<https://blogs.tribune.com.pk/story/45569/facebook-its-high-time-you-control-hate-speech-in-languages-other-than-english/>

# 1. Facebook: Global Destabilization

“In April, shortly before Zuckerberg’s Senate testimony, Phandeeyar and five other Myanmar groups **blasted him for claiming** in an interview with Vox that Facebook’s **systems had detected and removed incendiary messages** in September last year. ‘We believe **your system, in this case, was us**,’ they wrote. Zuckerberg apologized.”



# 1. Facebook: Global Destabilization for Profit

“I write articles arguing that banning bump stocks...won’t prevent mass shootings and that the left skews statistics.

I believe the opposite to be true.

I vehemently disagree with what I write...contributing to an atmosphere of hatred...pays well.”



“Ignored repeated warnings...  
**Facebook** had no clue...[about trust]  
They were totally unprepared.”

# Totally unprepared? ...or consciously profiting from anti-governance agenda.



June 2015: "...it is the responsibility of our industry to build the safest, most trustworthy products possible. This is why I am joining Facebook.' He said Facebook was the **best company to tackle global challenges**, like the fact that two thirds of humanity is yet to be connected."

<https://www.flyingpenguin.com/?p=23828>

## Towards a More Secure (Trusted) Future

Regulation of INTEGRITY Controls in ML



*What Success Looks Like...*

**Except... Remember that Seychelles Story?**

# America Feted Genocidal Dictators

- 1981 Seychelles Coup Attempt...
- 1982 Guatemala Coup
  - President Montt “soldier receives 5,160 years jail sentence for mass murder”
- 1982 Chad Coup
  - President Habre “life in prison for crimes against humanity, including kidnapping, torture, rape, sexual slavery and ordered killings”



<http://www.metroactive.com/papers/metro/05.22.97/cover/mobutu-9721.htm>  
<http://www.presidency.ucsb.edu/ws/?pid=344551>  
<https://www.flyingpenguin.com/?p=24049>



Praised Mobutu, the infamous Zairian kleptocrat, as "a voice of good sense and goodwill"



Assured Habre that US would help him with his "laudatory goals" as he committed crimes against humanity in Chad

# America Initiated De-regulated Information Harm Doctrine

1984: limits removed on harmful information to **vulnerable learners**, said **attackers must not be judged** for content that targets receive

1988: vetoed overwhelming support for limits on harmful content  
said **protection would oppress** rights of adversaries

- Congress: must address “**ideological child abuse**” risk
- Broadcasters: “we expected the President to sign it”
- President: “attackers must not be subject to “tastes of agency officials”

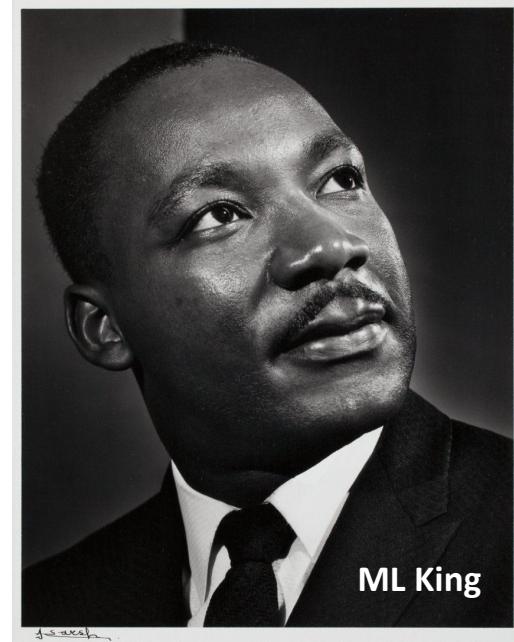


<http://www.nytimes.com/1988/11/07/us/reagan-vetoes-bill-putting-limits-on-tv-programming-for-children.html>

# CYBERWAR is Continuation of Politics by Machine Learning

“I refuse to accept the idea that [we are] mere flotsom and jetsom in the river of life, **unable to influence the unfolding events** which surround [us]. I refuse to accept the view that [we are] so tragically **bound to the starless midnight of racism and war** that the bright daybreak of peace and [humanity] can never become a reality.”

“I refuse to accept the cynical notion that nation after nation must **spiral down a militaristic stairway** into the hell of thermonuclear destruction. I believe that **unarmed truth and unconditional love will have the final word in reality.**”



<https://www.defensenews.com/congress/budget/2018/01/30/selva-fy19-budget-sees-increasing-investments-in-ai-machine-teaming/>

<https://www.riponsociety.org/2015/01/i-refuse-to-accept-the-view-that-the-bright-daybreak-of-peace-and-brotherhood-can-never-become-a-reality-2/>

# Reality Check: Lack of Protection Leads to Oppression



Eric Schneiderman

@AGSchneiderman

Follow



The internet should be one of the greatest tools for democracy—but it's increasingly being turned into an opaque, pay-to-play playground.

8:32 AM - 27 Jan 2018

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<https://www.nytimes.com/interactive/2018/01/27/technology/social-media-bots.html>  
<https://twitter.com/AGSchneiderman/status/957290102715281408>

# Ad Platforms: Misinformation Weapons Manufacturers

"A 'game' that has victims rather than players, hardly can be called a game at all. Instead, it is an example of carefully crafted social engineering that allows attackers to transfer value (from victims to themselves) without proper authorization."

"Any system or network that has been optimized for advertisements has been implicitly optimized for spreading misinformation."

## There's No Patch for Social Engineering

*Decoding the Language of "African" Scam Letters*



RSACONFERENCE2010

Davi Ottenheimer,  
flyingpenguin LLC  
  
Harriet Ottenheimer,  
Kansas State University

# It's Long Past Time to Build Big Data Regulatory Framework

## 4. Governance, Risk, Compliance

(standards & transparency, including vulnerability management)

### 1. Auth

(Authentication  
Authorization)



### 2. Encryption



### 3. Audit



Ingest

Store

Analyze

Surface



1934 *America First*  
was spreading Nazi  
propaganda.

FCC

In response:

“I recommend that the  
Congress create a new  
agency to be known as the  
Federal Communications  
Commission...”

-- President Roosevelt

<https://www.theatlantic.com/politics/archive/2016/05/william-randolph-hearst-gave-america-first-its-nationalist-edge/481497/>

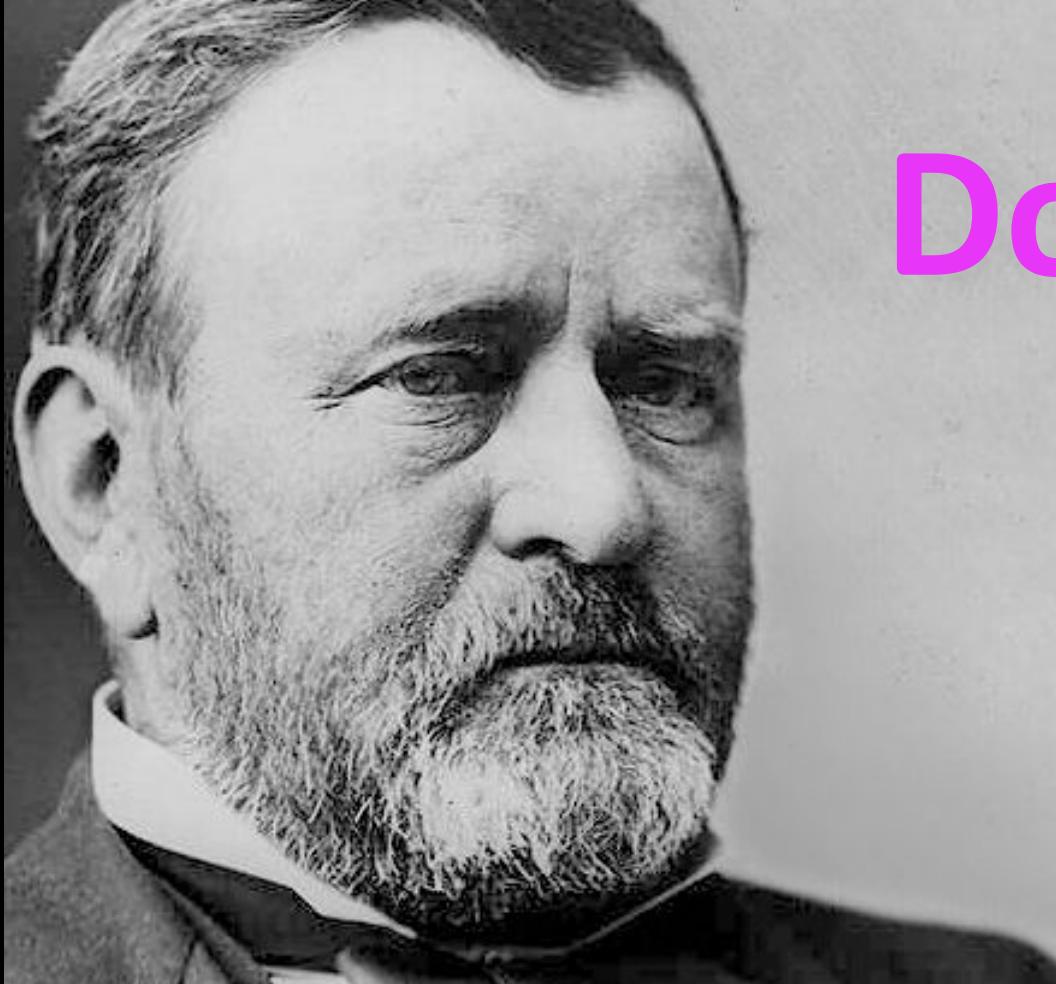
<https://www.washingtonpost.com/posteverything/wp/2016/06/14/donald-trumps-new-favorite-slogan-has-a-nazi-friendly-history/>

1870 ***KKK*** Was  
Litigating White  
Supremacy.

In response:

Act to Establish the  
Department of Justice  
(ch. 150, 16 Stat. 162)

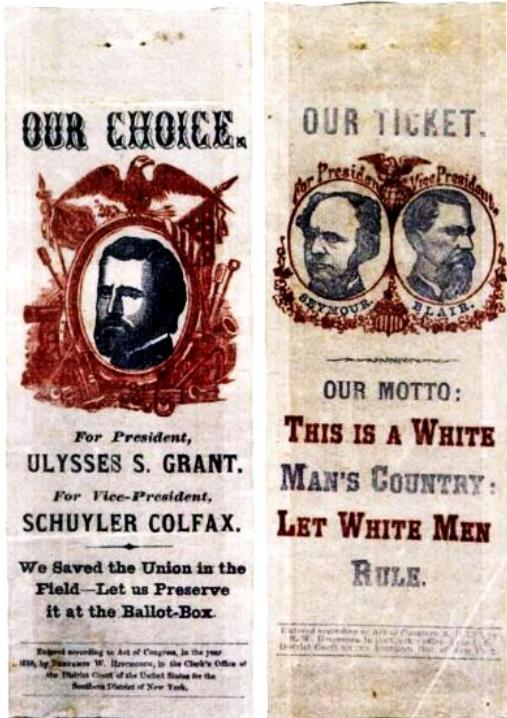
-- President Grant



DoJ

# The Civil Rights Battle of Our Time...What Do You Hear?

1868



2018

What do you hear?! Yanny or Laurel

150  
Years



# RSA® Conference 2019

San Francisco | March 4–8 | Moscone Center



# BETTER.

SESSION ID: MASH-F02

**Thanks! Please fill out a survey  
(esp if you want me to speak earlier in the week)**

Davi Ottenheimer



#RSAC