

Technology Trends

Surveillance

Center for Learning in Retirement

CLR Fall 2020

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Week 4

The What

- ~~Artificial Intelligence & Machine Learning~~
- ~~Robots & Drones~~
- ~~Autonomous Transportation Systems~~
- Surveillance
- (Cyber) Crime, Security & Warfare
- Medical Tech
- Media (incl. Social Media)
- (Virtual) Money & Blockchain
- Communication
- Earth & Sky
- Space

Surveillance - What is it?

- **Surveillance** is the monitoring of behavior, activities, or other changing information for the purpose of influencing, managing, directing, or protecting people. This can include observation from a distance by means of electronic equipment (such as closed-circuit television (CCTV) cameras) or interception of electronically transmitted information (such as Internet traffic or phone calls). The word surveillance comes from a French phrase for "watching over".



Official seal of the [Information Awareness Office](#) – a U.S. agency which developed technologies for [mass surveillance](#)

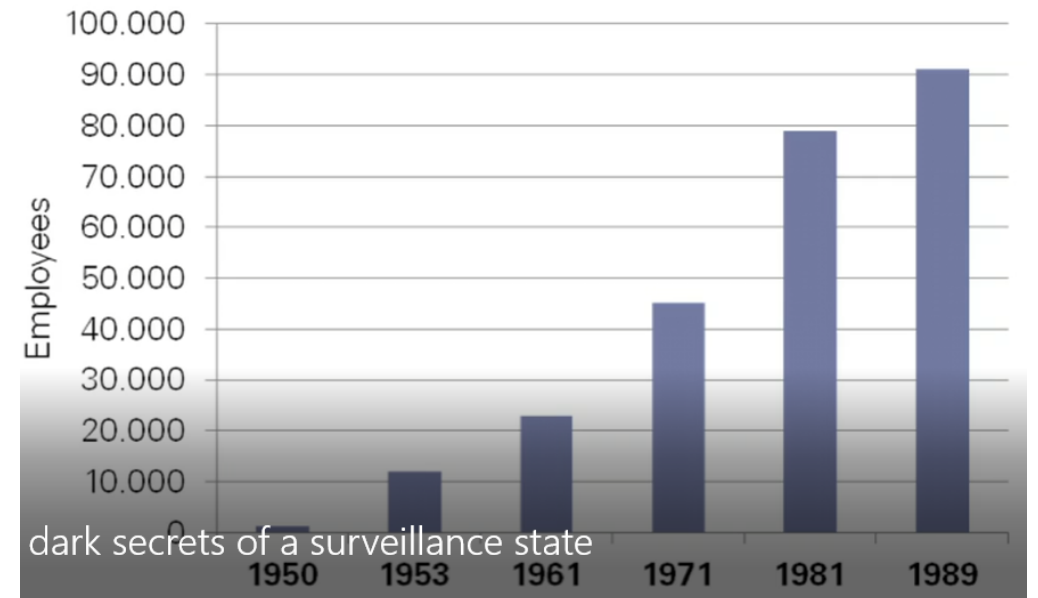
The STASI ([source](#))

- 1917 – Russia established CHEKA to counter revolution and sabotage, which evolved into the KGB
- 1945 – Russian secret police were instructors of the STASI
- 1950 – STASI established (E. Germany)
- 1989 – 90,000 employees

1 for every 180 inhabitants

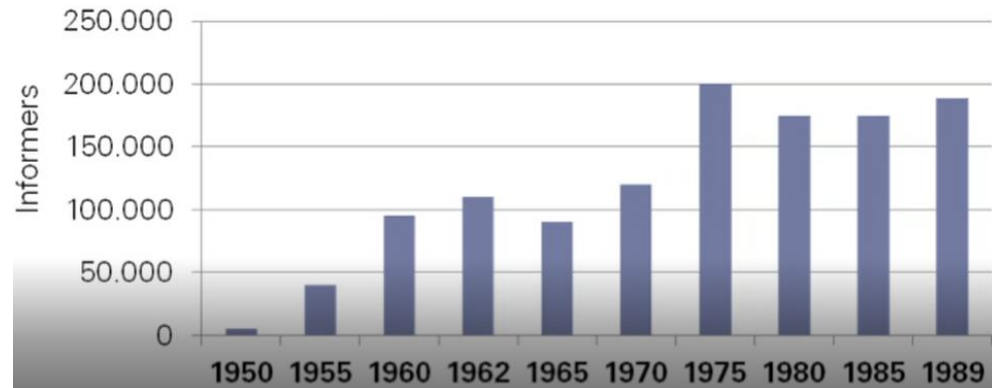
- Intelligence service – worldwide
- Secret police
- Public prosecutor – interrogation
- Armed forces – 11,000 soldiers

Stasi, official name Ministerium für Staatsicherheit (**German**: “Ministry for State Security”), secret police agency of the **German Democratic Republic (East Germany)**



The STASI

- Tools of the trade
 - Telephones tapped
 - Apartments bugged
 - 90,000 letters opened/day
 - Cameras
 - Stored 'smell of people'
 - Use of human intelligence
 - 200,000 informers
 - People betraying fellow citizens
- Motive
 - Control society, through fear
 - Destroy self-confidence

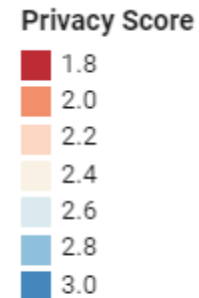


(1 min)

Summary

- Why are you collecting information
 - Protecting your people
 - Oppressing your people
- Potential for abuse in a democracy
- And then there's China, Russia, India...

1. China – 1.8 – Extensive surveillance
2. Russia – 2.1 – Systemic failure to maintain safeguards
3. India – 2.4 – Systemic failure to maintain safeguards



So what's changed?

Traffic Cameras and CCTV

- **Traffic enforcement cameras** (incl. [red light camera](#), road safety camera, road rule camera, photo radar, photo enforcement, speed camera, [Gatso](#), safety camera, bus lane camera, flash for cash, Safe-T-Cam) - a [camera](#) which may be mounted beside or over a [road](#) or installed in an enforcement [vehicle](#) to detect traffic regulation violations, including [speeding](#)...or for recording vehicles inside a [congestion charge](#) area. It may be linked to an automated ticketing system.
- **Closed-circuit television** (CCTV), aka **video surveillance** - the use of [video cameras](#) to transmit a signal to a specific place, on a limited set of monitors. Surveillance of the public using CCTV is common in many areas around the world. The **use of [body worn video](#)*** cameras are often used in law enforcement, with cameras located on a police officer's chest or head.



Toll and Vehicle Data Collection



- Electronic toll collection - aims to eliminate the delay on toll roads, HOV lanes, toll bridges, and toll tunnels by collecting tolls without cash and without requiring cars to stop. With cashless tolling, cars without transponders may be scanned for 'pay by plate' toll collection.
- Vehicle location data is the big data collection of vehicle locations, including automatic vehicle location data. Companies have collected over 1 billion scans of registration plates in the United States, stored in multiple national databases.

On-Board Diagnostics

- [OBD-II](#) – a standard that specifies the type of automotive diagnostic connector and its pinout, the electrical signaling protocols, and messaging format. It also provides a candidate list of vehicle parameters to monitor along with how to encode the data for each.
- [OBD-III](#) - a program to minimize the delay between detection of an emissions malfunction by the OBD-II system and repair of the vehicle. Two basic elements:
 - Read stored OBD-II information from in-use vehicles.
 - Direct owners of vehicles with fault codes to make immediate repairs
- OBD-III technologies support 3 ways to send and receive data:
 - Roadside reader
 - Local station network
 - Satellite
- OBD-III issues:
 - OBD-III imposes sanctions based on "suspicionless mass surveillance" of private property
 - Possible use of system for other purposes (Police pursuit/immobilization, tracking, cite speeders)



Purchase Tracking

- [Feds Warrantlessly Tracking Americans' Credit Cards in Real Time](#)
 - “Hotwatch” orders allow for real-time tracking of individuals in a criminal investigation via credit card companies, rental car agencies, calling cards, and even grocery store loyalty programs.
- [Sweeping NSA Surveillance Includes Credit-Card Transactions, Top Three Phone Companies' Records](#)
 - A Verizon business subsidiary had been ordered to hand over millions of records of phone calls made and received by all customers
 - NSA is operating a [vast Internet monitoring program calling PRISM](#), gaining access to the internal servers of the world's largest tech companies
- [Big Brother Is Watching You Swipe: The NSA's Credit Card Data Grab](#)
 - Agents hope to ferret out terrorists who are buying bomb ingredients, visiting hotbeds of radicalism, and moving funds illicitly...

Stopping trackers in their tracks

[Brian X. Chen](#), a consumer technology writer at the *The New York Times*, writes in to explain ways that emails can identify when and where you click, and how to dial back the tracking.

- Google's Gmail is so popular in large part because its artificial intelligence is effective at filtering out spam. But it does little to combat another nuisance: email tracking.
- The trackers come in many forms, like an invisible piece of software inserted into an email or a hyperlink embedded inside text. They are frequently used to detect when someone opens an email and even a person's location when the message is opened.
- When used legitimately, email trackers help businesses determine what types of marketing messages to send to you, and how frequently to communicate with you. This emailed newsletter has some trackers as well to help us gain insight into the topics you like to read about, among other metrics.
- But from a privacy perspective, [email tracking](#) may feel unfair. You didn't opt in to being tracked, and there's no simple way to opt out.
- Fortunately, many email trackers can be thwarted by disabling images from automatically loading in Gmail messages. Here's how to do that:
 - Inside Gmail.com, look in the upper right corner for the icon of a gear, click on it, and choose the "Settings" option.
 - In the settings window, scroll down to "Images." Select "Ask before displaying external images."
 - With this setting enabled, you can prevent tracking software from loading automatically. If you choose, you can agree to load the images. This won't stop all email tracking, but it's better than nothing.

What about Digital IDs ([source](#))

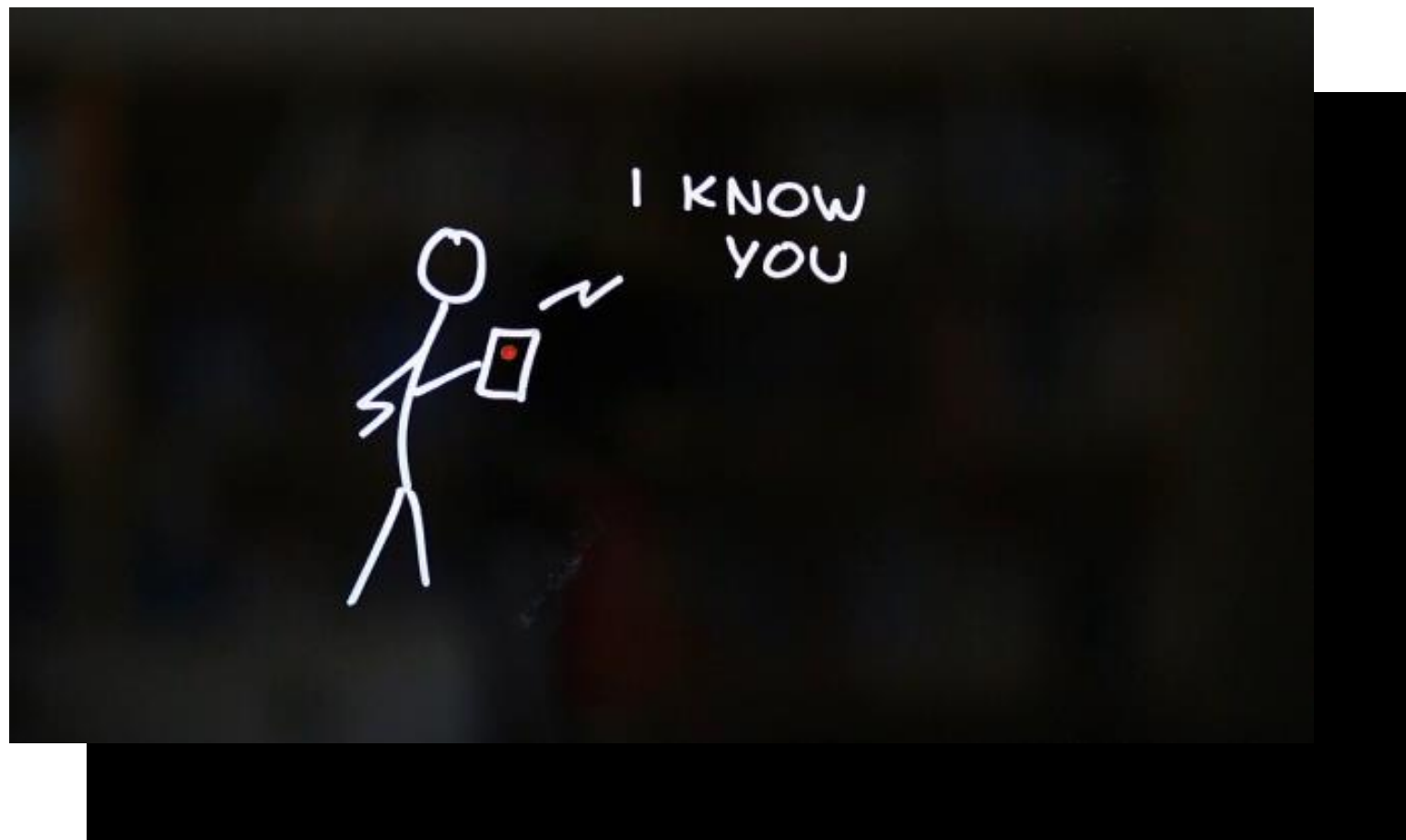
- From airports to health records systems, **technologists and policy makers with good intentions are digitizing our identities**
- Governments digitize citizens in an effort to universalize government services, while the banking, etc. aim to create seamless processes for their products and services
- But is the digital ID one of the gravest risks to human rights of any technology? Perhaps:
 - [facial recognition](#) technology, biometric databases, [geo-location](#) tracking, the Internet of Things, add AI and machine learning making decisions based on our identities
 - [social credit systems](#), such as those used in China, will be based on digital ID

Inside China's Vast New Experiment in Social Ranking

China is taking the idea of a credit score to the extreme, using big data to track and rank what you do—your purchases, your pastimes, your mistakes.

- For the Chinese Communist Party, social credit is an attempt at a softer, more invisible authoritarianism. The goal is to nudge people toward behaviors ranging from energy conservation to obedience to the Party.
- The government wants to preempt instability that might threaten the Party. “That’s why social credit ideally requires both coercive aspects and nicer aspects, like providing social services and solving real problems.”
- Under the national social credit system people will be penalized for the crime of spreading online rumors, among other offenses, and that those deemed “seriously untrustworthy” can expect to receive substandard services.

Facial recognition technology ethics and risks



Digital IDs – food for thought ([source](#))

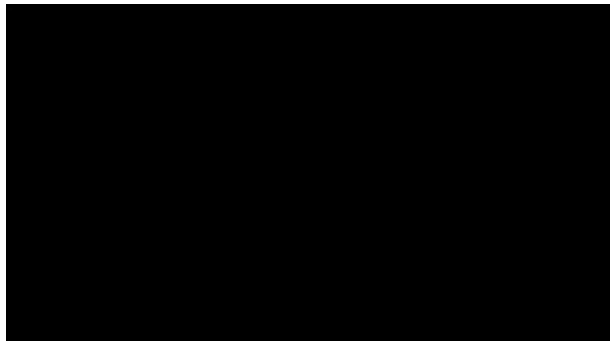
- Should use of a digital ID be mandated?
- How does the digital ID system work without becoming an easy target for hacking? Needs to adhere to principles for good digital security.
- Our data needs to be protected. Non-governmental legal experts, and civil society should be consulted in the administrative, legislative, and technical design of digital ID systems.
- Transparency is essential. Without transparency, there is no accountability.
- Access to our data by authorities must be governed by relevant international legal standards, particularly the [“Necessary and Proportionate” principles](#).
- Human rights protections must be built into the digital ID systems to mitigate harm. Without this, our fundamental rights will crumble...

Surveillance

- **Gunshot locator** (gunshot detection system) - a system that detects and conveys the location of gunfire or other weapon fire using acoustic, optical, or other types of sensors

[ShotSpotter - Gunshot Detection System](#)

['Shot Spotter' Technology: Game Changer For Chicago Violence?](#)



How far is too far?

- Police wearing body cameras
 - [Police Body Cameras Explained](#)
 - [Should police wear body cameras?](#)
- Mass surveillance
 - [MASS SURVEILLANCE](#)
 - [China Police are now wearing **facial recognition glasses**](#)



Three videos

- Surveillance Technologies – composite video (5 min) ([SenseTime](#))

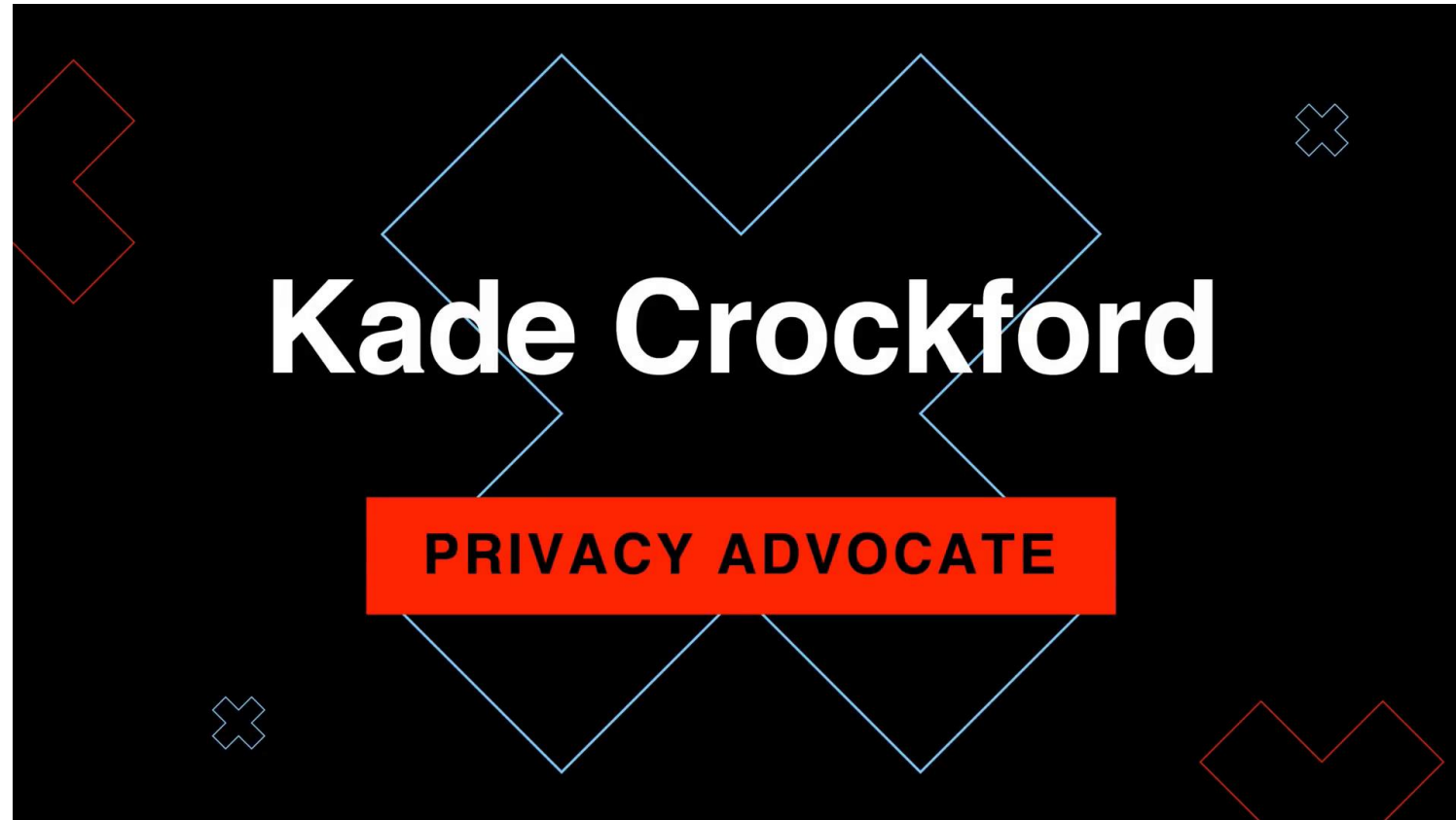


Current debate: facial recognition

- [The Facial Recognition Debate](#)
- [The fight over facial recognition technology gets fiercer during the Covid-19 pandemic](#)
- [IBM's decision to abandon facial recognition technology fueled by years of debate](#)
- [Google favors temporary facial recognition ban as Microsoft pushes back](#)
- [Microsoft says it won't sell facial recognition software to police until there's a national law 'grounded in human rights'](#)
- [Amazon Suspends Police Use of Its Facial-Recognition Technology](#)
- [A Case for Banning Facial Recognition](#)

Why Face Surveillance Must Be Banned

Kade Crockford



Facial Recognition References

- Facial Recognition: Last Week Tonight with John Oliver (HBO): <https://www.youtube.com/watch?v=jZjml...>
- AI, Ain't I A Woman? - Joy Buolamwini: <https://www.youtube.com/watch?v=Qxuyf...>
- Predicting Criminal Intent (from Films from the Future): <https://therealandrewmaynard.com/film...>
- Who's using your face? The ugly truth about facial recognition (FT): <https://www.ft.com/content/cf19b956-6...>
- The Major Concerns Around Facial Recognition Technology (Forbes): <https://www.forbes.com/sites/nicolema...>
- 'The Computer Got It Wrong': How Facial Recognition Led To False Arrest Of Black Man (NPR): <https://www.npr.org/2020/06/24/882683...>
- Clearview AI - The Secretive Company That Might End Privacy as We Know It (New York Times): <https://www.nytimes.com/2020/01/18/te...>
- The world's scariest facial recognition company, explained (VOX): <https://www.vox.com/recode/2020/2/11/...>
- The Delicate Ethics of Using Facial Recognition in Schools (Wired): <https://www.wired.com/story/delicate-...>
- Facial recognition: ten reasons you should be worried about the technology (The Conversation): <https://theconversation.com/facial-re...>
- ACLU resources on face recognition: <https://www.aclu.org/issues/privacy-t...>
- AI Now 2019 report: https://ainowinstitute.org/AI_Now_201...
- Why facial recognition is the future of diagnostics (Medical News Today): <https://www.medicalnewstoday.com/arti...>
- Facial recognition and AI could be used to identify rare genetic disorders (The Verge): <https://www.theverge.com/2019/1/15/18...>

Three videos

- [Surveillance State](#) (6 min)

The TED logo is rendered in a bold, red, sans-serif font. The letters are slightly shadowed, giving them a three-dimensional appearance. The background behind the logo is a light green grid pattern.

Ideas worth spreading

Three videos

- [Phone Companies](#) (3 min)



National Geographic, Feb. 2018

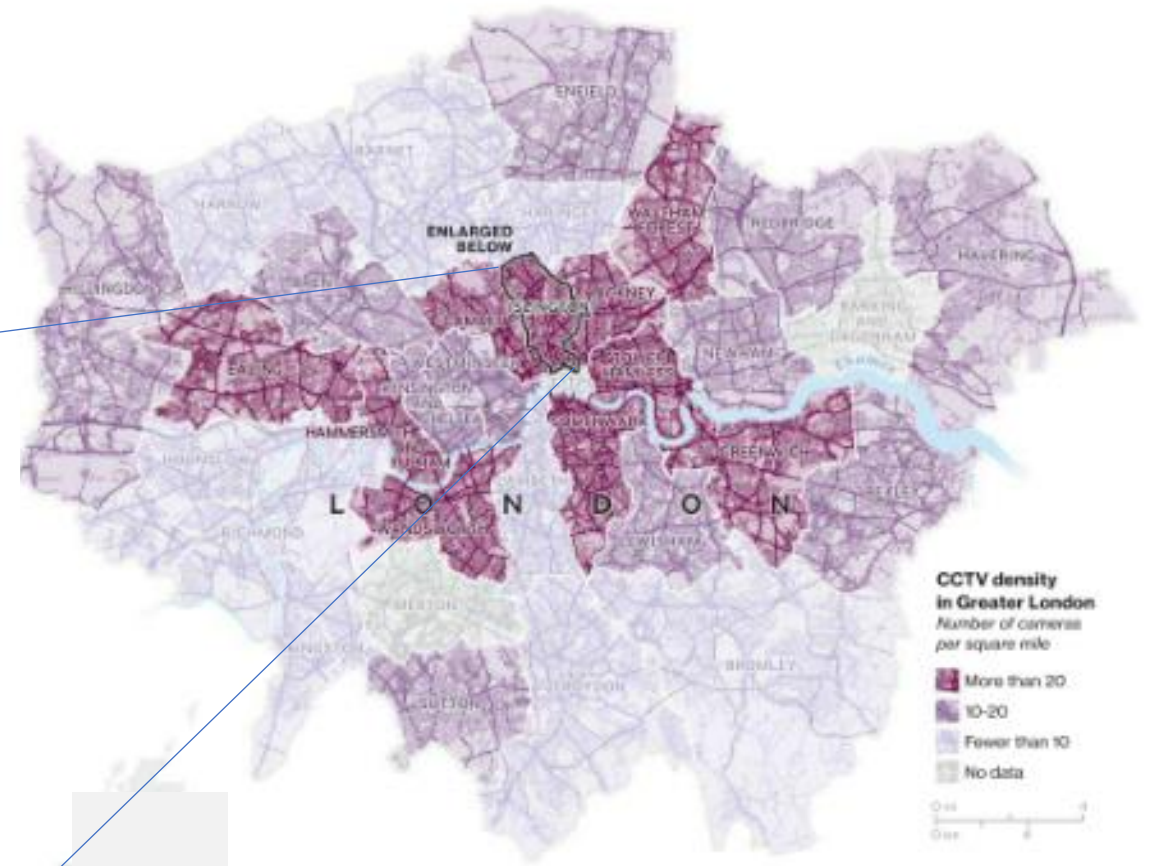


Islington (UK) CCTV control room

London's video surveillance system helped solve the 2005 terrorist bombing incidents



“Londoners are some of the most closely Watched city dwellers in the world.”



WATCHING

LONDON

London authorities were early adopters of widespread closed-circuit television (CCTV) surveillance after the city was targeted by terrorists using truck bombs in the early 1990s. From 2012 to 2015 the city saw a 72 percent increase in cameras, making up one-third of the U.K.'s cameras overall. Today Londoners are some of the most closely watched city dwellers in the world; as one example, the borough of Islington, just north of central London, monitors 180 cameras.



CCTV data for London and Islington is from 2015 and 2012, respectively. Islington map shows only fixed camera locations.

JASON FROST, MERVYN T. WILLIAMS, ROBERT WYPP
SOURCES: BBC, MITCHELL WATSON, ISLINGTON COUNCIL, OPERANCE SURVEY, UK

Some CCTV cameras are high-definition and can zoom in for a close-up shot from a distance of more than 3 soccer fields.

TAKING THE LONG VIEW

To demonstrate the capabilities of Islington's CCTV system, officials agreed to track a man hired by *National Geographic* as he strolled down Goswell Road. In these two views, a high-definition camera pulls back to offer the widest vantage and then zooms in for a close-up shot from a distance that's more than the length of three soccer fields.

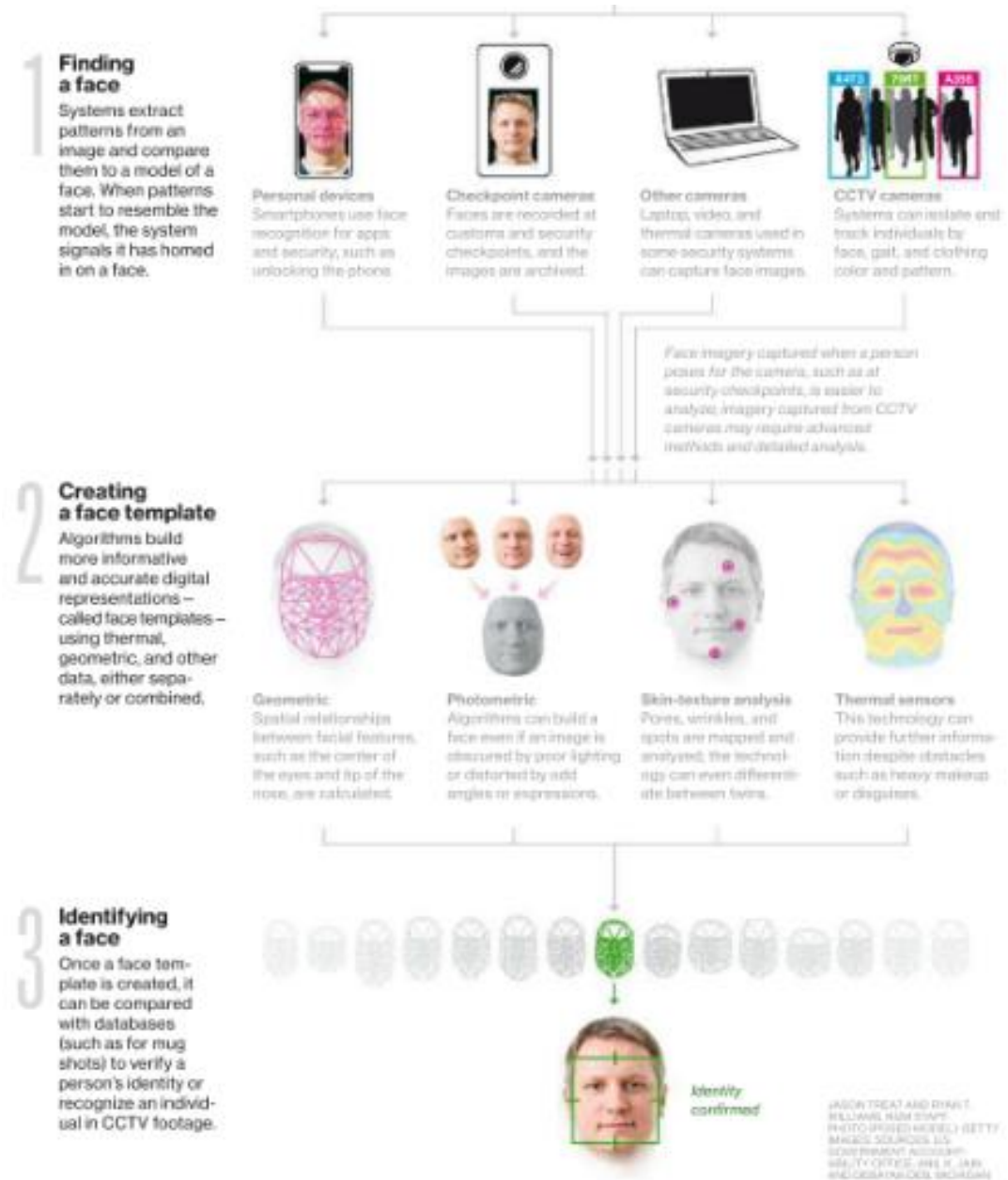
TOBY SMITH WITH ISLINGTON CCTV CONTROL ROOM



Face-scanning technology continues to improve and is starting to be employed at airports and government offices, and in some stores to identify returning customers and shoplifters.

3-steps:

- 1) Find a face
- 2) Create a face template
- 3) Identify a face and compare it with available data



Biometrics scanner catches impostor at U.S. airport on just third day of use


- A biometric facial comparison system flagged a traveler using a fake passport
- The new biometric system, which is in early testing in 14 international U.S. airports, matched the man's face to an identity different from the passport he presented
- During further examination, CBP officers found the actual ID from the Republic of Congo in his shoe...

This is a camera-equipped satellite called Dove developed by [Planet](#). 150 of these satellites are currently in orbit, each taking 2 images per second. Under favorable conditions these satellites can photograph the earth's entire landmass each day.



September 20, 2017

- 133 Dove satellites
- Each taking 10,000 photos
- Result in 1.3 million photos per day



1. PARIS 2. MOSCOW 3. NOORO III SOLAR PLANT, MOROCCO

WATCHING
EARTH

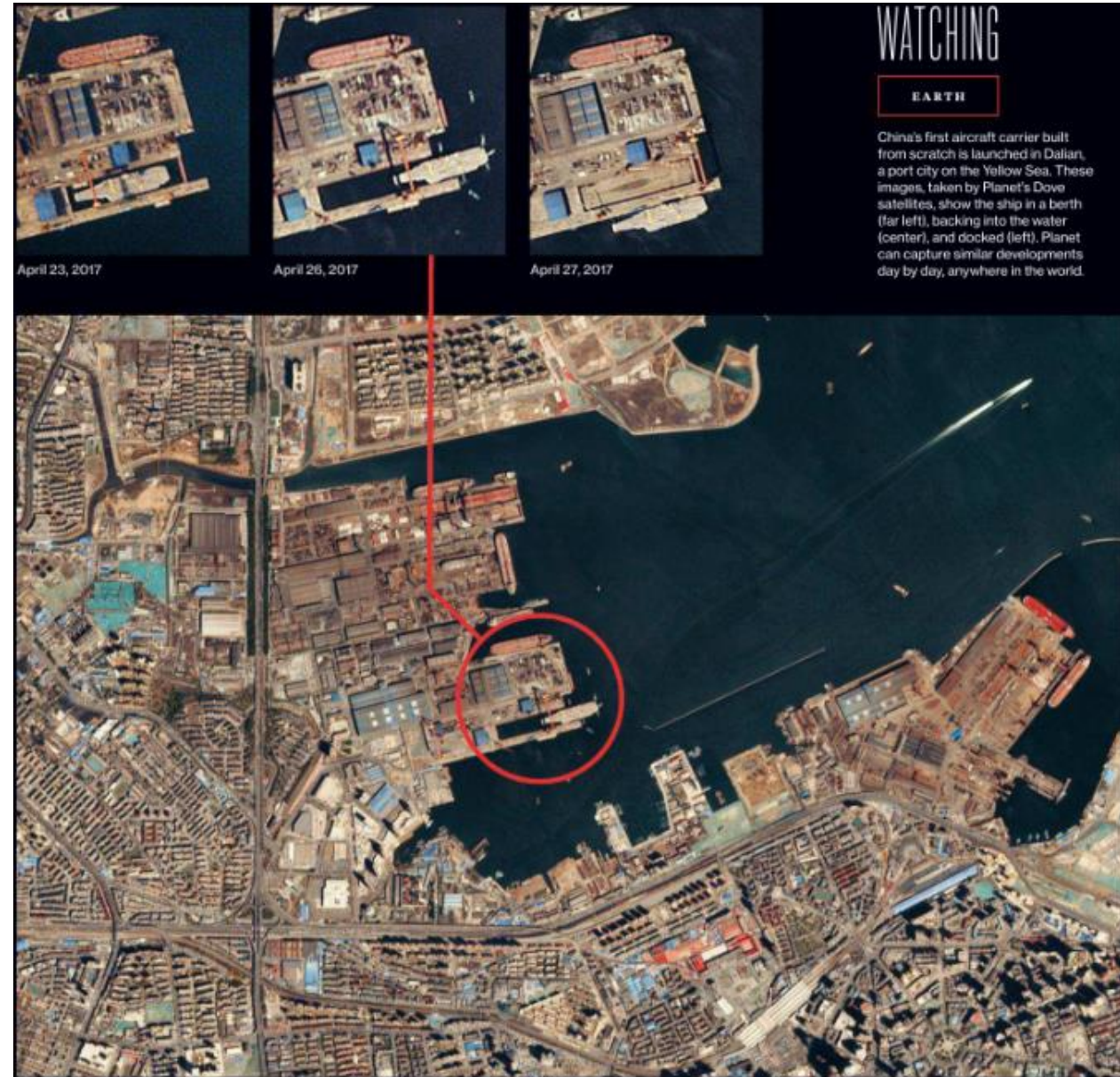
These are a selection of images taken by Planet's Dove satellites that were operating on September 20, 2017.

133 Number of satellites transmitting images that day

10,000 Number of photos each satellite shoots in a day

1.3 MILLION Number of images collected in a day

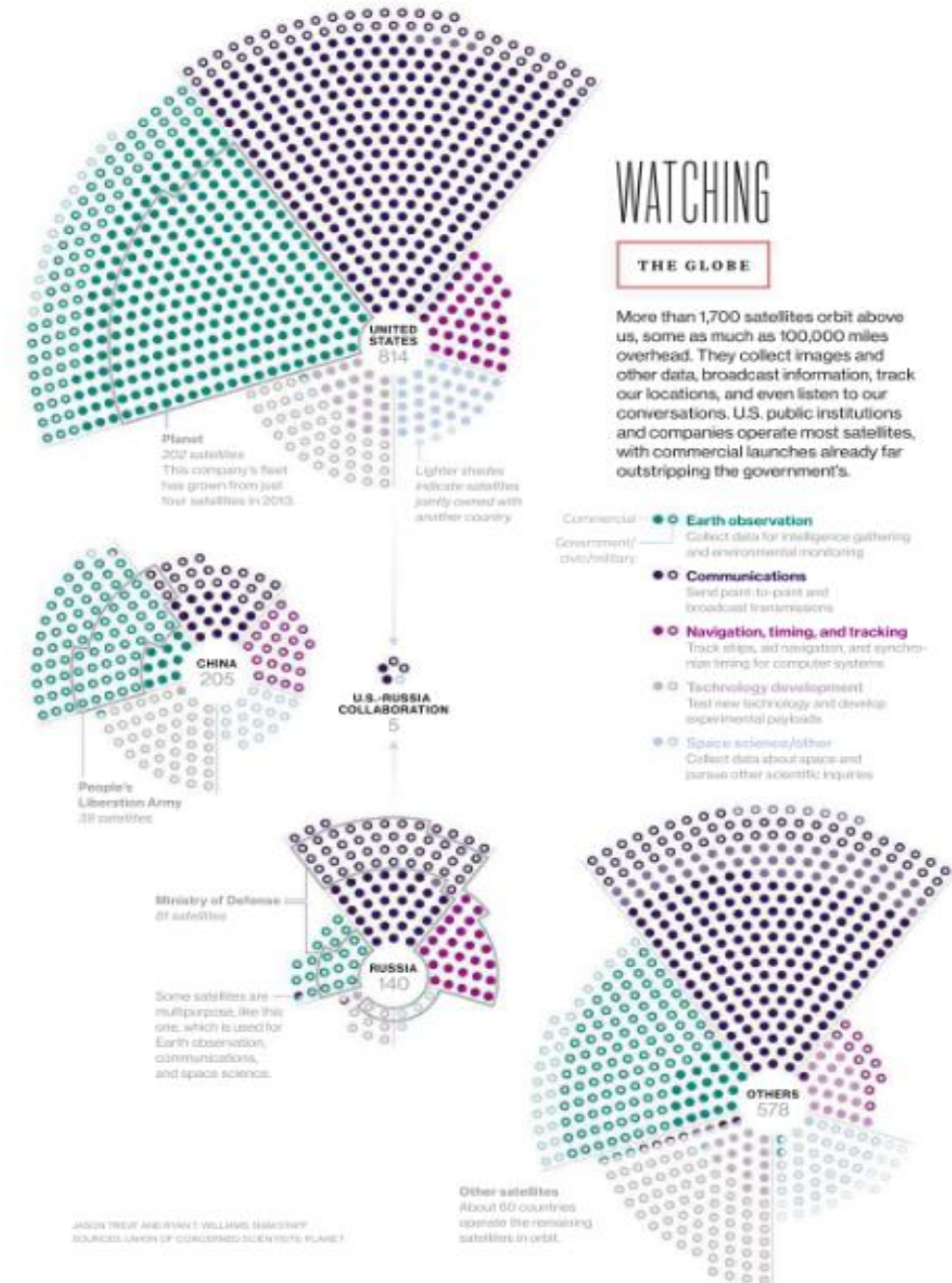
April 23 – 27, 2017
Dove satellites observe
China launching their
first aircraft carrier (built
from scratch).



Today, there are more than 1700 satellites in orbit collecting images and other data.

Categories of information gathering satellites (commercial & government):

- Earth Observation (green)
- Communications (black)
- Navigation, timing, and tracking (purple)
- Technology development (gray)
- Space science/other (light blue)



Discussion

- Does this 'emerging' technology' have the potential to benefit everyone equally?
- What are its risks and rewards?
- Does it promote autonomy (self-determination) or dependence?