ambient goverment:

a ‘smart’ world is a world under surveillance

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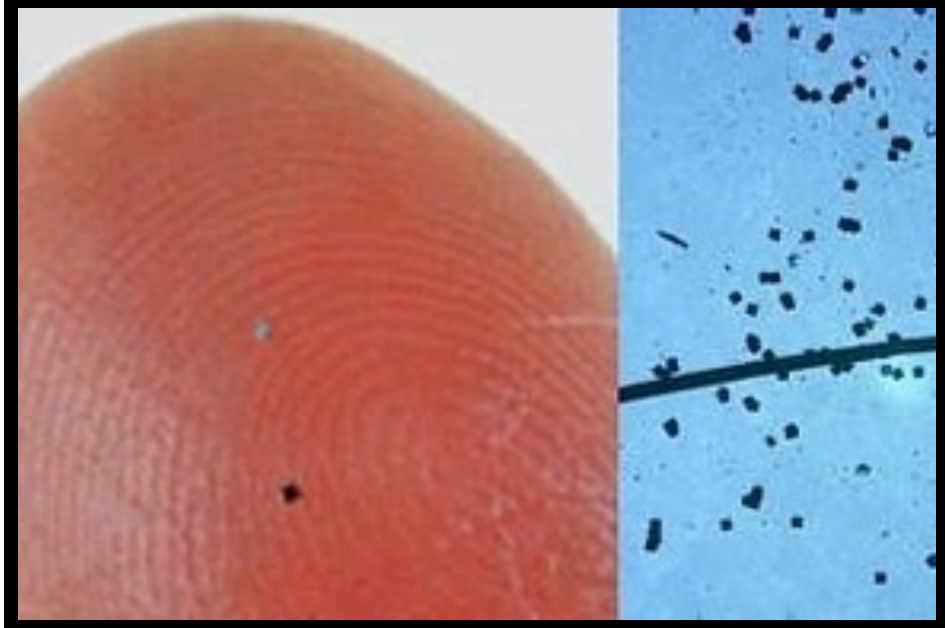
Control Society

- Old surveillance: tries to make people behave better
- New surveillance: tries to make things (including people) flow in the right ways
- Enabling and controlling rules embedded within the environment

Technological trajectories

- Bigger data + more intelligent analytics
- Distribution and networking: Cloud and IoT
- Size matters: decreasing size, increasing capabilities
- Mobility
- Biomimetics: things are not what they seem
- Infrastructurization and transformed environments: smart homes, smart cities etc.

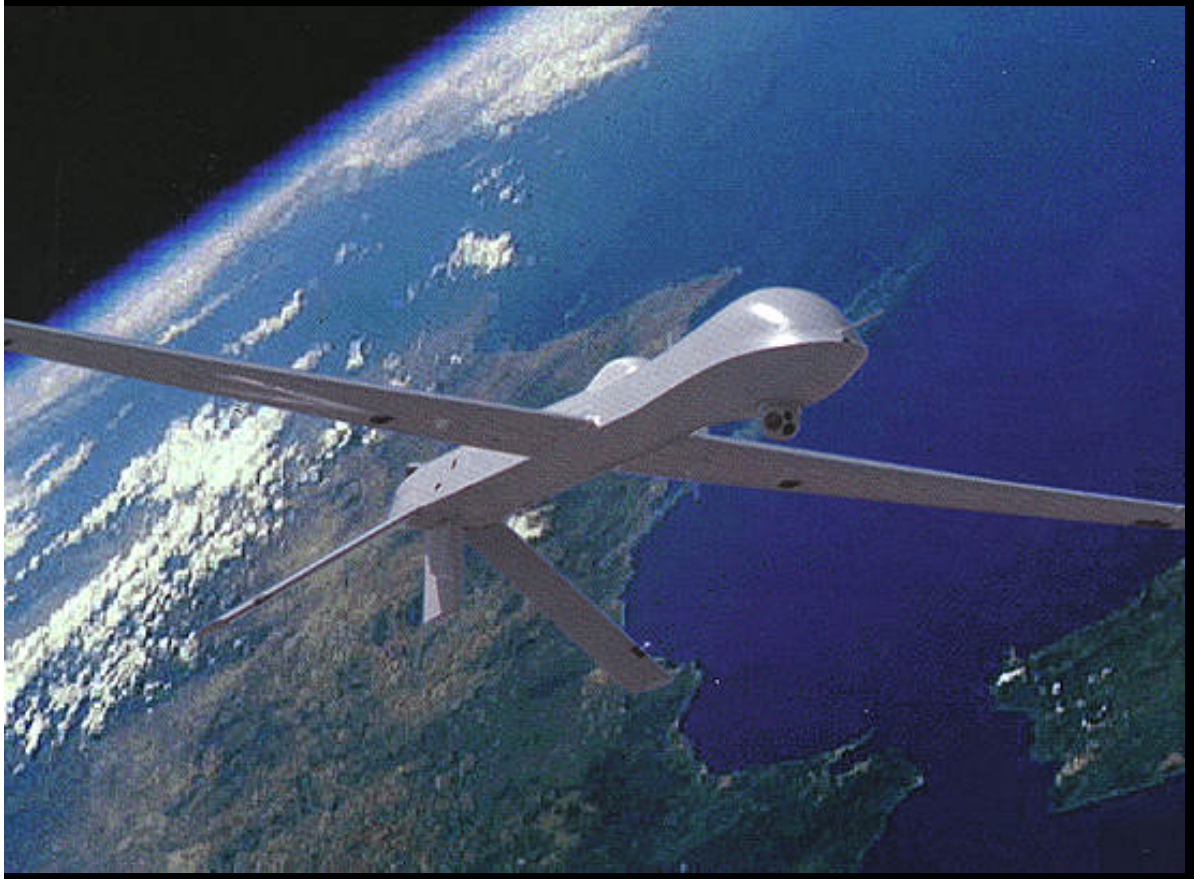


Tiny Sensors

- Workable sensors at smaller scales
- Distributed, wireless, multi-functional
- Smallest working sensors from Dust Networks, Hitachi
- ‘Motes’ - Will be seen as ‘big’ in very short time
- Already moved from 0.2 mm2 to 0.025 mm2
- Micro – Nano?

Top: Early prototype ‘smart dust’ mote on US penny (UC Berkeley Smart Dust project)
Below: Hitachi’s RFID powder (2009(

Mobile monitoring

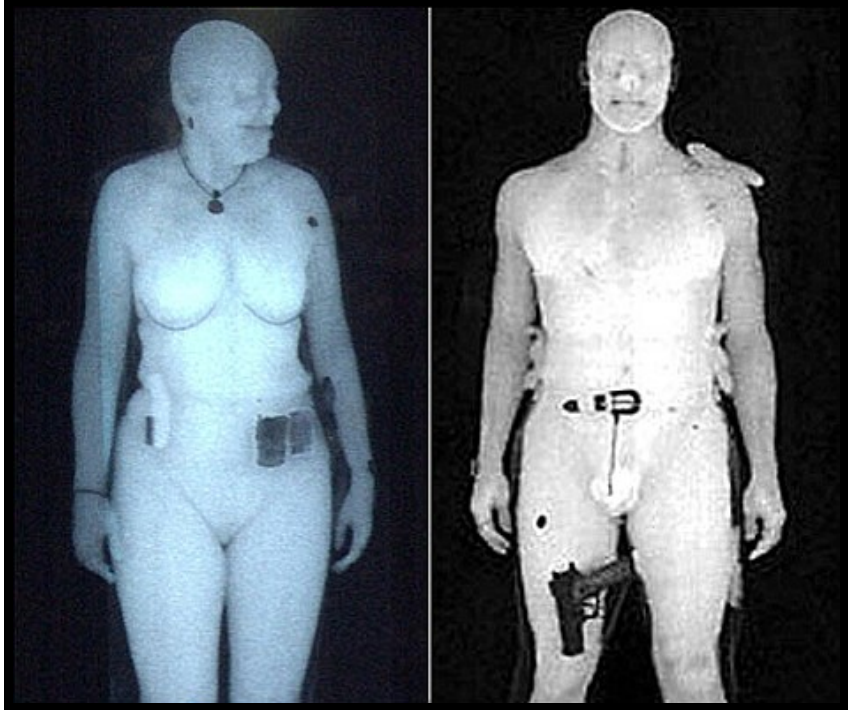


From the skies over the Gulf to the streets of Liverpool: UAVs (right – r/c helicopter camera military (PA); left - Predator drone aircraft (USAF)

Always with you

Google Glass

"X-ray Spex"



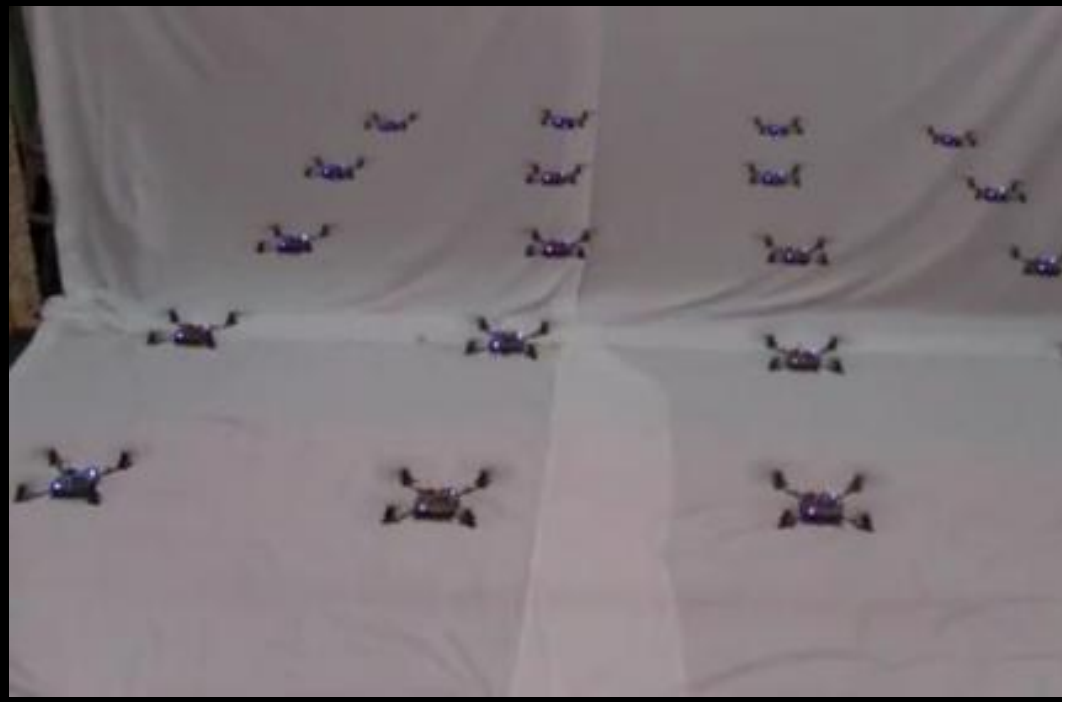
- Body-scanners have spread rapidly
- Terahertz wave scanning shown in theory to work in much smaller devices and output is 'good enough for video';
- Portable T-wave scanners being tested by NYPD in 2013 (theory to practice in just 4 years)

‘Is it a bird…?’

- Growth of RC and autonomous robot surveillance systems
- Biomimetics = Robotic devices that mimic natural systems
- Development largely funded by military research (US DARPA, Israel)
- Snakes, birds, insects
- Concept is to move to independent mobility
- Even prototypes in use are difficult to tell from their natural model

Top: : AeroVironment’s Nano Hummingbird robot
Below: Squishy octopus robot (Cecilia Laschi)

Hidden drone, swarming robot



'Upward-falling payloads', sea-launched UAVs (right, US Navy);
Co-operating drones (left, GRASP Lab UPenn)

- Robots can be anywhere, waiting
- Can work together and learn

Surveillancescapes

G-Max UPDS Perimeter Intrusion Detection system

Surveillancescapes

G-Max UPDS Perimeter Intrusion Detection system

Surveillance is everywhere

- Ubiquitous Computing (ubicomp) ***is*** ubiquitous surveillance (ubisurv)
- But surveillance is nowhere easily seen, managed or controlled
- NY Police: no need for warrants for Stingray, because 'everyone knows phones emit data'
- 'Hacking' - or just no protection?
- What are the costs of failure in / of a 'smart world'?
- What are the costs of it working too well?

How a 'Stingray' Cellphone Tracking Device Works

Law-enforcement officials are quietly using gadgets referred to generically as 'stingrays' to locate cellphones as part of investigative work.

1. Often the device is used in a vehicle along with a computer with mapping software.

2. The stingray system, which mimics a cellphone tower, gets the target phone to connect to it.

3. Once the cellphone is detected by the stingray, the phone's signal strength is measured.

Source: WSJ research and government documents

4. The vehicle can then move to another location and again measure the phone's signal strength.

5. By collecting signal strength in several locations, the system can triangulate and map a phone's location.

How Stingray works…

Image of sleeping baby acquired from an unprotected home camera system via Shodan

Automating Securityscapes

Rafael ADS Sentry-Tech Stationary Remote Controlled Weapon Station (Israel / Palestine)

Automating Securityscapes

EADS Cassidian integrated Border Surveillance Solution (Saudi Arabia)