



# Surveillance and Data Exposure

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March 6, 2007

## Traditional means of surveillance

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- Communication
  - Location
  - Habits
  - Identification
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## Surveillance of Communications

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- Digital technology was initially harder to monitor
    - Communications Assistance to Law Enforcement Act (1994) required wiretap capacity.
    - Digital information lends itself to storing more easily.
  - Pen Register Act (1986)
    - Lowest investigative standard
    - No privacy expectations in phone number dialed
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## Surveillance of Communications

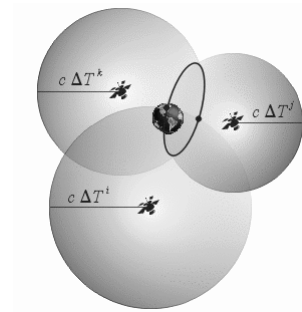
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- NSA data collection
    - Metadata
    - Social Network Mapping
  - Call records for sale?
  - CALEA expansions
    - ISP obligations
    - Retention vs. Preservation
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## Location Awareness

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- Cell phone triangulation
  - Device and network-based
  - Accuracy: ~2-10 meters
- Global Positioning Systems
  - Accuracy: ~10 meters
- Benefits



## Closed Circuit Television (CCTV)

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- Increasingly popular
  - Seen as a deterrent and enforcement mechanism
  - 500,000 in London alone
  - Effective in prosecution, but limited evidence of deterrence
- 2 million tickets issued from UK speed cameras



## Intelligent cameras

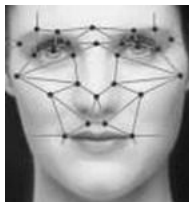
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- Guide human intelligence
  - Monitor public spaces for abnormal behavior
    - Abandoned packages
    - Restricted areas
    - Pickpockets
  - Backtracking: recall after a triggering event
  - Pair cameras with microphones, other sensors
    - Gunfire detection
    - Alarm systems
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## Face Recognition

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- Subject to real constraints
  - Works very well in controlled circumstances
  - Identification vs. Authentication



## Voice quality information

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- Measurement of non-linguistic vocal features (Pentland et al)
    - Frequency, emphasis, turn-taking
  - Strong predictor of outcomes in several social settings
    - Negotiations experiment
    - Speed dating
    - Social network dynamics
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## “Voluntary” data exposure

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- Subway flasher
  - AOL search history
  - DNA databases
  - Driving monitors
  - *“While it is voluntary for you to furnish this information, we may not be able to pay benefits to your spouse unless you give us the information”*
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## Online social communities

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- Information is now explicitly tied to an individual
  - Monitored by local, national law enforcement
  - CMU Facebook study (Acquisti & Gross)
    - High rate of personal data
    - Lack of understanding of visibility
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## Was Orwell right?

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- **Is complete surveillance easy?**
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## Was Orwell right?

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- **Is complete surveillance easy?**
  - **Yes:** Try to avoid cameras, checklists, networked communication
  - **No:** US-Mexico Border protection
    - Goal: detect any human crossing of a 2000 mile line
    - Estimated cost: \$80 million – \$2 Billion
    - Fences, cameras, ground sensors
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## Theory of Data Exposure

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- Panopticism
  - Automation
  - Overt vs. Covert
  - Choice?
  - Redefining Roles
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## Privacy Threats and Countermeasures?

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- Communication Records
  - Location Awareness
  - Cameras
  - Web communities
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