

# Politics of Cyberspace @ JCOGS Privacy

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1

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## Topics

- Privacy in US Jurisprudence
- Effects of Information Technology on Privacy
- Fourth Amendment Issues
- Key US Laws Protecting Privacy
- Defending Privacy in Cyberspace
- Privacy Resources for Everyone



2

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## Privacy in US Jurisprudence

- Privacy:
  - ❑ Power to control truths about you that other people know
  - ❑ Power to hide parts of the truth
- Myth: "If you have done nothing wrong, you have nothing to fear from breaches of privacy."
  - ❑ Many private acts and statements are not illegal or immoral, but societal norms allow them to remain private: known only to participants or those selected to know
  - ❑ Obvious example is sexual interactions
  - ❑ But key issue is that those in power may use breaches of privacy to punish those who threaten the political power-structures

3

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## Common Law Privacy (1)

*The makers of our Constitution... Sought to protect Americans in their beliefs, their thoughts, their emotions and their sensations. They conferred as against the Government, the right to be let alone – the most comprehensive of the rights of man and the right most valued by civilized men."*



Justice Louis D.  
Brandeis  
Dissenting in the  
*Olmstead* decision

4

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## Common Law Privacy (2)

Invasion of privacy under common law:

- Intrusion upon seclusion
- Appropriation of name or likeness
- Publicity given to private life
- Publicity placing person in false light
- US Constitution does not specifically mention privacy
  - ❑ But 4<sup>th</sup> amendment usually applied when discussing government intrusion



5

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## Types of Privacy

- Informational privacy: Truths you have revealed to others but still want to control
  - ❑ Public records
  - ❑ Medical records
  - ❑ But public behavior is not protected
- Truths you have kept private
  - ❑ Books you read
  - ❑ What you say in private letters or e-mail
  - ❑ Used to protected by laws of *trespass*



6

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## Effects of Information Technology on Privacy

- Controlling Electronic Information is Difficult
- Easier Data Acquisition
- Informational Privacy
- Privacy & the Internet
- Privacy & Social Media
- Data Collection on the Web
- IoT
- Drones
- Spyware



7

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## Controlling Electronic Information is Difficult

- E-mail messages often circulated without permission
  - ❑ Theoretical violation of copyright
  - ❑ In practice, impossible to stop once it starts
- Private message group discussions are often made public
  - ❑ Can be embarrassing
  - ❑ Has led to lawsuits



8

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## Easier Data Acquisition

- Radical change in ease of acquiring data about *individuals*
  - ❑ Electronic purchase records
  - ❑ Telephone and e-mail records
  - ❑ Surveillance technology redefines *public space*
  - ❑ Identification technology reduces the anonymity of the crowd
  - ❑ Public records online
- Radical change in ease of acquiring *aggregate* data about *groups*



9

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## Informational Privacy

- US law traditionally did not limit uses of observations about consumers
  - ❑ What you buy / read / view / eat
  - ❑ Data shared among credit agencies
  - ❑ Names, addresses, preferences sold to advertisers
  - ❑ Even medical data were not much protected
- European Privacy Directive much more stringent
  - ❑ Caused problems for US firms – barred from doing business because of lax laws



10

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## Privacy and the Internet

- Google bought DejaNews
  - ❑ Archive of all USENET discussions
  - ❑ Spans ~15 years
  - ❑ Can provide interesting information about previous levels of professionalism
- Google caches Web pages
  - ❑ Owner can remove an embarrassing page from Web site
  - ❑ But cached copy persists for months
- Wayback Machine
  - ❑ >332 billion web pages saved



11

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## Privacy & Social Media

- Facebook case
  - ❑ Illustrates how user behavior is monetized
  - ❑ What we click on, what we post, what we like – information sold to advertisers
- Authoritarian governments redefine privacy
  - ❑ PRC govt routinely monitors postings, email
  - ❑ Those insufficiently "loyal" to the dictatorship are punished and even killed



12

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## Data Collection on the Web

- Cookies store information about where you have been on a specific Web site
  - ❑ E.g., AMAZON uses cookies to track your identity and your book preferences
  - ❑ Unless badly formed, cookies are not supposed to be shared among Web sites
- Web bugs
  - ❑ 1-pixel images (invisible) that return information to specific advertisers
  - ❑ Allow tracking of how many people visit a Web page vs how many click on ads



13

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## Data Collection – cont'd

### Spyware

- Software that covertly communicates with a Web address (*phones home*)
- Caught by firewalls
- E.g., was present in Comet Cursor – cartoon cursors favored by children
  - ❑ Sent information about exactly what Web pages kids were looking at
  - ❑ Covert market research
- Some spyware transmits all details of everything done on infected computer
- Some spyware does not remove itself via its uninstall function



14

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## Internet of Things (IoT)

- Many electronic objects now connecting to remote computers via Internet
  - ❑ Fridges automatically send email about time to buy new supplies
  - ❑ Electronic speakers respond to voice commands
- Concern about equipment with microphones and cameras
  - ❑ Some have primitive artificial intelligence
  - ❑ But still not smart enough to protect privacy
  - ❑ E.g., Alexa smart speaker recently transmitted conversation to someone's voicemail by mistake



15

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## Drones

- Little helicopter-like units
- Often equipped with cameras
- Already known to have been used to spy on victims in back yards and through upper windows
- Being used by law-enforcement
- Serious questions about invasions of privacy



16

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## What Is Spyware?

- Spyware: any *technology* that covertly gathers information
  - ❑ About person
  - ❑ About organization
  - ❑ About system
  - ❑ Without knowledge of victim
- Any *software* which
  - ❑ Employs user's Internet connection
  - ❑ In background ("backchannel")
  - ❑ Without their knowledge or explicit permission



17

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## How does Spyware Enter a System?

- Install freeware, shareware
  - ❑ Often those that are ad-supported
- Some browser plugins
  - ❑ Offer new functions
  - ❑ New file format compatibility
- Viruses & worms
  - ❑ E-mail attachments



18

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## Removing Spyware

- Problems with uninstalling spyware
  - ❑ Some products do not (or did not) include uninstall function
  - ❑ Uninstall function failed in several cases
  - ❑ Some products reinstall themselves
- Tools available for removal; e.g.,
  - ❑ AdAware
  - ❑ Aureate/Radiate DLL remover
  - ❑ CA Anti-Spyware



19

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## Blocking & Removing Spyware

- Can prevent messages from reaching "mother ship"
- Modern antivirus/security programs; e.g.,
  - ❑ AVG
  - ❑ Bitdefender
  - ❑ BullGuard
  - ❑ Malwarebytes
  - ❑ McAfee
  - ❑ Norton
  - ❑ PCProtect
  - ❑ Scanguard
  - ❑ TotalAV
  - ❑ TrendMicro



20

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## Preventing Spyware Infestations

- Read the fine print before installing software
  - ❑ Especially *adware* = freeware supported by advertising
- Run appropriate scanners (removal tools) periodically
- Firewalls help identify infestations as well as blocking transmissions
  - ❑ Choose firewall capable of trapping unexpected *outbound* connections
  - ❑ Set parameters to alert user to unauthorized connections



21

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## Arguments Defending Data Collection

- Doesn't hurt anyone
- No names collected
- Helps to improve effectiveness of advertising
- Improves market mechanisms by providing statistical information about consumer preferences



22

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## Attacks on Data Collection

- Issue is control
- Covert data collection is unacceptable
- Data subject must be informed
  - ❑ Who is collecting what info
  - ❑ For what purpose
  - ❑ How to stop collection
  - ❑ Who has used information



23

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## Fourth Amendment Issues

- Fourth Amendment to the US Constitution passed in 1791
  - ❑ Forbids unreasonable search and seizure by government and law enforcement agents
- Did not apply to new technological means of information gathering
  - ❑ 1928 SCOTUS decision excluded telephone wiretaps from 4<sup>th</sup> Amendment protection
  - ❑ Brandeis dissented, arguing that interpretation must be updated to include new technologies

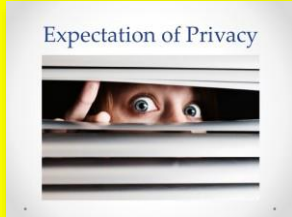


24

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## New Interpretations of 4<sup>th</sup> Amendment

- 1968 Katz vs US
  - ❑ Constitution protects “people, not places”
  - ❑ Invasion of property not the issue
  - ❑ Key is whether person has “reasonable expectation of privacy”



25

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## Later Judgements

Would you expect privacy in

- Bank records (no: US vs Miller)
- Car travel tracked by LoJack (no: US vs Knotts)
- Material stored in open field (no: Oliver vs US)
- Garbage on curbside (no: CA vs Greenwood)
- Material visible from plane (no: Dow Chemical v US)
- Marijuana farming Gro-Lights seen via infrared cameras (yes: US vs Robinson)



26

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## Key US Laws Protecting Privacy

- Fair Credit Reporting Act of 1970
- Privacy Act of 1974
- Right to Financial Privacy Act of 1978
- Privacy Protection Act (PPA), 1980
- Electronic Communications Privacy Act (ECPA), 1986
- Computer Fraud & Abuse Act (1986)
- Telephone Consumer Protection Act, 1991
- Health Insurance Portability and Accountability Act (HIPAA), 1996
- Gramm-Leach-Bliley Act (GLB), 1999



27

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## Fair Credit Reporting Act of 1970

- Credit reports limited to
  - ❑ Credit application
  - ❑ Insurance
  - ❑ Employment
  - ❑ Government benefits
  - ❑ Business transactions justifying such reports
- Credit bureaus are data sinks
  - ❑ Share information via clients (banks etc.)
  - ❑ Refusals can be mislabeled, sent on
  - ❑ Wrong data can circulate endlessly
  - ❑ FCRA requires due care to remove / correct bad info
- See <http://www.ftc.gov/os/statutes/fcra.htm>



28

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## Privacy Act of 1974 5 USC §552a

- Government agencies may not conceal data gathering about individuals and data repositories
- Also restrictions on distribution
- Publish notice giving details including
  - ❑ Name, location
  - ❑ Types of people covered
  - ❑ Purposes of routine uses of the data
  - ❑ Responsible persons
  - ❑ Means for *data subjects* to check correctness of record about themselves

<http://www4.law.cornell.edu/uscode/5/552a.html>  
<http://www.usdoj.gov/04foia/privstat.htm>



29

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## Right to Financial Privacy Act of 1978 (amended 1987)

- Limits *government* access to financial records
- Allows reports to government agencies for
  - ❑ Establishing collateral or security for loan
  - ❑ Bankruptcy proceedings
  - ❑ Application for government loans
- Banks (etc.) may notify government agencies of suspected wrongdoing
- Customers may authorize any disclosure
  - ❑ Permission extends max. 3 months
  - ❑ Permission can be revoked any time

[http://www.dol.gov/dol/allcfr/SOL/Title\\_29/Part\\_19/toc.htm](http://www.dol.gov/dol/allcfr/SOL/Title_29/Part_19/toc.htm)



30

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## Privacy Protection Act (PPA) of 1980 42 USC §2000aa

- Protects journalists' and writers' materials and sources
- Require probable cause for search or seizure
  - ❑ Except if crime is in process or has already occurred
  - ❑ To prevent immediate injury to a victim
- Steve Jackson Games case
  - ❑ Secret Service raided game company
  - ❑ Seized computers, refused to return them
  - ❑ See <http://www.eff.org/Legal/Cases/SJG/>  
<http://www4.law.cornell.edu/uscode/42/2000aa.html>



31

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## Electronic Communications Privacy Act (ECPA), 1986

- 17 USC §1367 et al.
  - Governs interception and disclosure of electronic communications
    - ❑ Telephone
    - ❑ E-mail
    - ❑ Fax
    - ❑ Pager
  - Employers are not subject to ECPA restrictions on their own employees' communications
    - ❑ Except if they have allowed a reasonable expectation of privacy to develop
- <http://www.cpsr.org/cpsr/privacy/wiretap/ecpa86.html>



32

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## Computer Fraud & Abuse Act, 1986

- 18 USC §1030 (a)
- Bars unauthorized access to electronic sources
- Primary law for punishing *hackers*
- Defines intrusion as felony
- Penalties severe
  - ❑ 1<sup>st</sup> offense
    - ✓ Up to \$250,000 fine
    - ✓ Up to 5 years in federal penitentiary
  - ❑ 2<sup>nd</sup> offense
    - ✓ Up to \$500,000 fine
    - ✓ Up to 10 years imprisonment



33

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## Telephone Consumer Protection Act, 1991

- 47 USC §227
  - Bars automated calling systems that charge consumers
  - Makes unsolicited commercial fax illegal
    - ❑ Need pre-existing business relation or
    - ❑ Agreement of recipient
  - Some attempts to extend this law to junk e-mail
    - ❑ UCE = unsolicited commercial e-mail
    - ❑ aka SPAM
- [http://www.fcc.gov/ccb/consumer\\_news/tcpa.html](http://www.fcc.gov/ccb/consumer_news/tcpa.html)



34

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## U.S.A.P.A.T.R.I.O.T. Act (1)

- Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act
- Called the "US Patriot Act" to sway public opinion in its favor
- Passed by a Congress whose members *did not* read the text of the Act before approving it
- Based on premise that civil liberties prevented discovery of 9/11 plot



35

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## U.S.A.P.A.T.R.I.O.T. Act (2)

- Extension of Foreign Intelligence Surveillance Act (FISA)
  - ❑ Allows surveillance of US citizens and residents by CIA & NSA
- Information sharing between intelligence agencies and law enforcement
  - ❑ Had been separated after abuses in 1950s & 1960s
- Increased authority to Attorney General to circumvent restrictions on domestic surveillance limitations



36

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## U.S.A.P.A.T.R.I.O.T. Act (3)

- Warrant can be obtained *without providing evidence* to justify request
  - ❑ Inform FISA Court judge that surveillance is "relevant" to an investigation
  - ❑ Target need not be subject of investigation
  - ❑ No requirement to report findings to judge or to subject
  - ❑ Judge has only 2 choices
    - ✓ Grant permission
    - ✓ Accuse law enforcement of lying
- Easier surveillance in cases of suspected computer crime – some without court order



37

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## U.S.A.P.A.T.R.I.O.T. Act (4)



38

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## Health Insurance Portability and Accountability Act (HIPAA), 1996

- 42 USC 1297ii
- Protects employees who change jobs but want to keep their health insurance
- Mandates administrative simplification
- Privacy provisions affect everyone who collects, keeps and transmits medical information
- Patients must have full access to their medical files
- Standards for protecting individually identifiable health information
- <http://www.hcfa.gov/hipaa/hipaahm.htm>



39

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## Gramm-Leach-Bliley Act (GLB), 1999

- Financial Services Modernization Act
- Many sections dealing with structure of banks, securities firm
- Title V – Privacy
  - ❑ Clear disclosure of privacy policies
  - ❑ Notice to consumers
  - ❑ Opt-out of sharing consumer info
  - ❑ Enforced by FTC, federal banking agencies, SEC, National Credit Union Administration
- <http://www.senate.gov/banking/conf/grmleach.htm>



40

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## Defending Privacy in Cyberspace: Technology

- Encryption
- Steganography
- Anonymizers



41

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## Encryption

- Methods for converting (encrypting) original text (*plaintext*) into gibberish (*ciphertext*)
  - ❑ Reversible (*decipherable*) only if recipient is given a *key* to unscramble
- Secret-key cryptography
  - ❑ Ancient origins
  - ❑ But difficult to manage if many readers must decipher the ciphertext
- Public-key cryptography
  - ❑ Create a *pair* of keys
  - ❑ Each can decipher what the other encrypts
  - ❑ Keep one *private* and make the other *public*



42

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## Steganography

- Information in images based on series of bits (1s and 0s) defining *pixels*
- Can alter *lower-order* bits without making obvious changes to colors of the pixels
- Thus can store other info in pixels using special *steganography* ("hidden writing") program
- Needs the same special program to decode the hidden message
- Must *know* that the message is hidden in the image



43

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## Anonymizers

- All Internet usage generates info about which computers were used
  - ❑ *Internet protocol* (IP) addresses can be recorded for access to Web pages or for email
  - ❑ Typically specific IP addresses can be tied to specific areas on the globe
  - ❑ E.g., IP addresses for Stowe VT are recognizable down to specific homes
- Anonymizers
  - ❑ Strip the original IP address from the *packets* of information
  - ❑ Allow anonymous access to Web
  - ❑ The Onion Network (TOR) is example



44

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## Defending Privacy in Cyberspace: Organizations

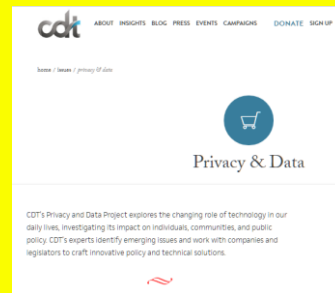
- Center for Democracy and Technology
- Electronic Frontier Foundation
- Electronic Privacy Information Center (EPIC)
- Privacy International



45

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## Center for Democracy and Technology (CDT)



- State Privacy Resource Center
- Digital Decisions
- Student Privacy
- Drones
- Broadband Privacy
- Internet of Things
- Health Privacy

46

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## Electronic Frontier Foundation (EFF)

- Free speech
- Creativity & innovation
- International issues
- Privacy
- Security
- Transparency



47

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## Electronic Privacy Information Center (EPIC)



48

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## Privacy International (PI)

- AI
- Biometrics
- Data Retention
- Communications Surveillance
- Cross-Border Data Access
- Cyber Security
- Data Protection
- Financial Privacy
- GDPR
- Govt Hacking
- Identity & Privacy
- IoT
- Mass Surveillance
- Migration & Borders
- Policing & Tech
- Profiling
- Security-Assistance Agreements between Governments
- Smart Cities
- Social-Media Surveillance

49

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## Privacy Resources for Everyone

- Privacy Checklist
- AARP Fraud Watch
- Privacy-Monitoring Services



50

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## Privacy Checklist (1)

<http://tinyurl.com/ogf7ntg>

- DesMarais, C. (2013). "11 Simple Ways to Protect Your Privacy." *TIME*

1. Don't fill out your social-media profile
2. Be choosy about sharing your social security number – even the last 4 digits
3. Lock down your hardware (i.e., use password to access)
4. Turn on private browsing
5. Use a password vault that generates & remembers strong, unique passwords
6. Use two-factor authentication



51

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## Privacy Checklist (2)

<http://tinyurl.com/ogf7ntg>

7. Set up a Google alert for your name.
8. Pay for things with cash.
9. Keep your social-network activity private.
10. Don't give out your zip code when making credit card purchases.
11. Lie when setting up password-security questions.



52

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## AARP Fraud Watch

<http://tinyurl.com/y77czozd>



53

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## Privacy-Monitoring Services

- Lifelock < <https://www.lifelock.com/products/> >
  - Various plans/prices
  - All include
    - ✓ Support in case of fraud
    - ✓ Alerts for threats (e.g., requests to change address)
- IDShield < <https://www.idshield.com/> >
  - Monitor wide range of activities
  - Support restoration of identity



54

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