

# **A GIFT OF FIRE**

**THIRD EDITION**

**SARA BAASE**

## **CHAPTER 2: PRIVACY**

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# WHAT WE WILL COVER

- **Privacy and Computer Technology**
- **“Big Brother is Watching You”**
- **Privacy Topics**
- **Protecting Privacy**
- **Communications**

# PRIVACY AND COMPUTER TECHNOLOGY

## Key Aspects of Privacy:

- **Freedom from intrusion (being left alone)**
- **Control of information about oneself**
- **Freedom from surveillance (being tracked, followed, watched)**

# PRIVACY RISKS AND PRINCIPLES

**Privacy threats come in several categories:**

- ✓ **Intentional, institutional uses of personal information**
- ✓ **Unauthorized use or release by “insiders”**
- ✓ **Theft of information**
- ✓ **Inadvertent leakage of information**
- ✓ **Our own actions**

# PRIVACY AND COMPUTER TECHNOLOGY

## New Technology, New Risks:

- **Government and private databases**
  - Thousands of databases containing personal information about us.
  - Profiles of our personal information could be created easily.
- **Sophisticated tools for surveillance and data analysis**
  - Cameras, GPS, cell phones

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

- **Vulnerability of data**
  - Leaks of data happens, existence of data presents a risk.

# PRIVACY RISKS AND PRINCIPLES

## New Technology, New Risks – Examples:

### Search query data

- Search engines collect many terabytes of data daily.
- Data is analyzed to target advertising and develop new services.
- Who gets to see this data? Why should we care?

# PRIVACY RISKS AND PRINCIPLES

## New Technology, New Risks – Examples:

### Smartphones

- Location apps
- Data sometimes stored and sent without user's knowledge



# PRIVACY RISKS AND PRINCIPLES

## **New Technology, New Risks – Summary of Risks:**

- **Anything we do in cyberspace is recorded.**
- **Huge amounts of data are stored.**
- **People are not aware of collection of data.**
- **Software is complex.**
- **Leaks happen.**

# PRIVACY RISKS AND PRINCIPLES

## **New Technology, New Risks – Summary of Risks**

**(cont.):**

- **A collection of small items can provide a detailed picture.**
- **Re-identification has become much easier due to the quantity of information and power of data search and analysis tools.**
- **If information is on a public Web site, it is available to everyone.**

# PRIVACY RISKS AND PRINCIPLES

## New Technology, New Risks – Summary of Risks

(cont.):

- **Information on the Internet seems to last forever.**
- **Data collected for one purpose will find other uses.**
- **Government can request sensitive personal data held by businesses or organizations.**
- **We cannot directly protect information about ourselves. We depend upon businesses and organizations to protect it.**

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

## Terminology and principles for data collection and use:

- **Invisible information gathering**
  - Collection of personal information about someone without the person's knowledge
  - Unauthorized software, Cookies, ISP providers
- **Secondary use**
  - Use of personal information for a purpose other than the one it was provided for .

**Q:**

**RECALL AN EXAMPLE OF  
INVISIBLE INFORMATION  
GATHERING ABOUT YOU...**

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

## Terminology (cont.):

### Secondary use:

#### 1- Data mining

Searching and analyzing masses of data to find patterns and develop new information or knowledge

#### 2- Computer matching

Combining and comparing information from different databases (using social security number, for example, to match records)

# Privacy and Computer Technology (cont.)

Terminology (cont.):

- Data mining - searching and analyzing masses of data to find patterns and develop new information or knowledge
- Computer matching - combining and comparing information from different databases (using social security number, for example, to match records)
  - D&D Matching
  - VA Benefits
  - Debate

# Computer Matching

- Combining and comparing information from more than one database. Some examples:
  - Sharing of government agencies' databases to detect fraud by recipients of government programs.
  - Creating consumer dossiers from various business databases.



# Computer Matching

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## Computer-Based Art Changes to Match Viewer's Mood

Friday, August 04, 2006

By Sara Goudarzi [E-Mail](#) | [Print](#)

[LIVE SCIENCE](#)

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**The world may not smile when you smile or frown when you're down, but some new digital artwork will adapt itself to match your mood.**

The electronic art can alter itself by changing color and brush strokes. Through a [Webcam](#), [software](#) associated with the art recognizes eight facial features, such as the shape of the mouth and the eyebrows, and figures out the emotional state of the viewer.

When the viewer is happy, the colors of the artwork change to bright and vibrant and the brush strokes look soft. But if the viewer is angry, the art turns dismal, with aggressively applied leaden colors.

"It does all of this in real time, meaning that as the viewer's emotions change, the artwork responds accordingly," said John Collomosse of the Department of [Computer Science](#) at the [University of Bath](#) in England.

Collomosse and colleagues created the images using rendering techniques, which gave the appearance that they were painted on canvas.

"This kind of empathic painting only needs a desktop computer and a Webcam to work, so once you have the program and have calibrated it for the individual viewer," he explained, "you are ready

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## Divorce rates 'will be cut by computer matching'

By [Kate Watson-Smyth](#)

Thursday, 25 May 2000

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Single people who want a long-term relationship will turn increasingly to computer dating agencies to help them find a partner, says a study.

Single people who want a long-term relationship will turn increasingly to computer dating agencies to help them find a partner, says a study.

Once the agency finds the right person, clients will be offered support through bad times or help to get over a broken relationship before being set them up with someone new.

This view of the future that dispenses with the chat-up line is part of a three-year study into what life will be like in 2020.

*The Tomorrow Project*, by the Rev Michael Moynagh and Richard Worsley, predicts that divorce rates will fall through computer matching.

Dr Moynagh said: "People are impatient to know if a relationship is going to work. They don't want to invest the time getting to know someone if it is going to go wrong. They have a real desire to make it work and this kind of arranged marriage may be the future.

"It's not a Big Brother kind of scenario - it will be voluntary. The agency will provide a support network. If a relationship breaks up they will nurse individuals through the transition, provide social events to minimise loneliness and arrange for another partner."

Lucy Selleck, a counsellor and spokesman for Relate, was horrified at people relying on computers to meet partners. "Relationships are not about ticking boxes," she said. "People need to make their own choices. There is a place for dating agencies but it would be terrible if everyone relied on computers. They can't tell if people will be attracted to each other by answering a few questions."

### EDITOR'S CHOICE



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# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

## Terminology (cont.):

### 3- Computer profiling

- Analyzing data in computer files to determine characteristics of people most likely to engage in certain behavior
- Businesses find new consumers
- Government detects fraud and crime activities

# Privacy and Computer Technology (cont.)

- Profiling
  - Using data in computer files to predict likely behaviors of people. Some examples:
    - Businesses engage in profiling to determine consumer propensity toward a product or service.
    - Government agencies use profiling to create descriptions of possible terrorists.

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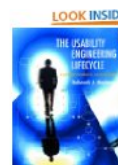
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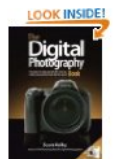
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# **PRIVACY AND COMPUTER TECHNOLOGY (CONT.)**

## **Principles for Data Collection and Use:**

- **Informed consent**
- **Opt-in and opt-out policies**
- **Fair Information Principles (or Practices)**
- **Data retention**

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

- **Informed consent**
  - People should be informed about the data collection and use policies of a business or organization,
  - They can then decide whether or not to interact with that business or organization.

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

- **Opt-in and opt-out policies**
  - To give people some control over secondary uses
  - Under opt-out policy, the organization can use one's information for other purposes only if he explicitly inform the organization (ex. Signs a form) permitting the use.
  - Under opt-in policy, the collector of information may not use it for other purposes unless the consumer explicitly permits the use.



# **PRIVACY AND COMPUTER TECHNOLOGY DISCUSSION QUESTIONS**

**Have you seen opt-in and opt-out choices?  
Where? How were they worded?**

**Were any of them deceptive?**

**What are some common elements of privacy  
policies you have read?**

# PRIVACY AND COMPUTER TECHNOLOGY (CONT.)

- **Fair Information Principles (or Practices)**
  - Inform about personally identifiable information
  - Collect only data needed
  - Offer opt-out from email, advertising, etc
  - Stronger protection of sensitive data
  - Keep data only as long as needed
  - Maintain accuracy of data
  - Policies for responding to law enforcement
  - Protect security of data.

# "Big Brother is Watching You" (cont.)

The Fourth Amendment, Expectation of Privacy and Surveillance Technologies(p66) :

- Has technology strengthened or weakened the Fourth Amendment???
- Weakening the Fourth Amendment
- Supreme Court decisions and expectation of privacy
  - Modern surveillance techniques are redefining expectation of privacy

# "Big Brother is Watching You" (cont.)

- The Fourth Amendment, Expectation of Privacy and Surveillance Technologies (cont.):
- The USA Patriot Act and national security letters
  - No court order or court oversight needed
  - 2003-2005 report found "widespread and serious misuse" of the FBI's national security letter authorities

# "BIG BROTHER IS WATCHING YOU"

## Databases:

- **Government agencies collect many types of information**
- **Ask business to report about consumers**
- **Buy personal information from sellers**
- **Main publicized reason: data mining and computer matching to fight terrorism**

# "BIG BROTHER IS WATCHING YOU"

**Databases:**

**Private information can be used to:**

- ✓ **Arrest people**
- ✓ **Jail people**
- ✓ **Seize assets**

# "BIG BROTHER IS WATCHING YOU"

## Databases:

- **Millions of crime suspects are searched in government databases**
- **Shift from presumption of innocence to presumption of guilt**
- **Computer software characterizes suspects**
  - Innocent people are sometimes subject to embarrassing searches and expensive investigations and to arrest and jail.

# "Big Brother is Watching You"

## Small Sampling of Government Databases with Personal Information

What data does the government have about you?

- Tax records
- Medical records
- Marriage and divorce records
- Property ownership
- Welfare records
- School records
- Motor vehicle records
- Voter registration records
- Books checked out of public libraries
- People with permits to carry firearms
- Applications for government grant and loan programs
- Professional and trade licenses
- Bankruptcy records
- Arrest records



# **"BIG BROTHER IS WATCHING YOU" (CONT.)**

- **Some constitution articles (laws) protect privacy.**
- **Modern surveillance techniques are redefining expectation of privacy.**
- **What privacy is included in those laws ?**

# "BIG BROTHER IS WATCHING YOU" (CONT.)

## In some countries:

- No court order or court oversight needed to get one's private information.
- 2003-2005 report found "widespread and serious misuse" of the FBI's national security letter authorities.

# "BIG BROTHER IS WATCHING YOU"

## Two key problems arise from new technologies:

- Much of our personal information is no longer safe in our homes; it resides in huge databases outside our control.
- New technologies allow the government to search our homes without entering them and search our persons from a distance without our knowledge.

# "BIG BROTHER IS WATCHING YOU" (CONT.)

## Video Surveillance:

- Security cameras in Shopping centers, malls, banks, etc.
- Cameras alone raise some privacy issues.
- When being combined with face recognition systems, they raise more privacy issues.
  - Increased security
  - Decreased privacy

# **"BIG BROTHER IS WATCHING YOU" (CONT.) DISCUSSION QUESTIONS**

**What data does the government have about you?**

**Who has access to the data?**

**How is your data protected?**

# DIVERSE PRIVACY TOPICS

## Marketing, Personalization and Consumer Dossiers:

- Targeted and personalized marketing (business, political parties, etc)
- Paying for consumer information

### Examples

- Trading data to win prizes
- Targeting ads to users by scanning their emails! Like Gmail.

# DIVERSE PRIVACY TOPICS

- Data firms and consumer profiles
  - Companies (firms) that collect information about individuals
  - These firms sell data to other companies for marketing purposes.
- **Data mining is being used**
- **Credit records might be sold to different parties**

# DIVERSE PRIVACY TOPICS

## Social Networks

- **What we do**
  - Post opinions, gossip, pictures, “away from home” status
- **What *they* do**
  - New services with unexpected privacy settings



# **DIVERSE PRIVACY TOPICS (CONT.)**

## **Location Tracking:**

**Global Positioning Systems (GPS) -  
computer or communication services that  
know exactly where a person is at a  
particular time**

**Cell phones and other devices are used for  
location tracking**

**Pros and cons**

# **DIVERSE PRIVACY TOPICS (CONT.)**

**Stolen and Lost Data:**

**Hackers**

**Physical theft (laptops, thumb-drives, etc.)**

**Requesting information under false  
pretenses**

**Bribery of employees who have access**

# **DIVERSE PRIVACY TOPICS (CONT.)**

## **What We Do Ourselves:**

- Some people do not know or understand enough how the web works in order to make good decisions about what to put there.**
- Some people do not think carefully.**
- People often want a lot of information about others but do not want others to have access to the same kind of information about themselves.**

# **DIVERSE PRIVACY TOPICS (CONT.)**

## **What We Do Ourselves:**

- Our cell phone and email messages reside on computers outside our home or office.**
- We have no direct control over such files.**
- There have been many incidents of exposure of emails for politicians, businessmen, etc.**

# **DIVERSE PRIVACY TOPICS (CONT.)**

## **What We Do Ourselves:**

- ✓ **Personal information in blogs and online profiles**
- ✓ **Pictures of ourselves and our families**
- ✓ **File sharing and storing**
- ✓ **Is privacy old-fashioned?**
  - Young people put less value on privacy than previous generations.
  - May not understand the risks.

# DIVERSE PRIVACY TOPICS (CONT.)

## Public Records: Access vs. Privacy:

- ✓ Public Records - records available to general public (bankruptcy, property, and arrest records, salaries of government employees, etc.)
- ✓ Identity theft can arise when public records are accessed
- ✓ How should we control access to sensitive public records?

# **DIVERSE PRIVACY TOPICS (CONT.)**

## **Children ( privacy and safety)**

### **The Internet**

- Not able to make decisions on when to provide information
- Vulnerable to online predators

### **Parental monitoring**

- Software to monitor Web usage
- Web cams to monitor children while parents are at work
- GPS tracking via cell phones or RFID

# **DIVERSE PRIVACY TOPICS (CONT.)**

## **Children ( privacy and safety)**

- ✓ **At what age does web monitoring become an invasion of the child's privacy?**
- ✓ **Should parents tell children about the tracking devices and services they are using?**
- ✓ **Informed consent is a basic principle for adults. At what age does it apply to children?**
- ✓ **Will intense tracking and monitoring slow the development of a child's responsible independence?**
- ✓ **Will parents rely more on gadgets than on talking to their children?**



# **DIVERSE PRIVACY TOPICS DISCUSSION QUESTIONS**

- **Is there information that you have posted to the Web that you later removed? Why did you remove it? Were there consequences to posting the information?**
- **Have you seen information that others have posted about themselves that you would not reveal about yourself?**

# **Diverse Privacy Topics (cont.)**

National ID System:

- Social Security Numbers
  - Too widely used
  - Easy to falsify

# **Diverse Privacy Topics**

## **(cont.)**

### **National ID System (Cont.):**

- **A new national ID system - Pros**
  - would require the card
  - harder to forge
  - have to carry only one card
- **A new national ID system - Cons**
  - Threat to freedom and privacy
  - Increased potential for abuse

# Diverse Privacy Topics

- Most folks have figured out by now you can't do anything on the Web without leaving a record. - Holman W. Jenkins Jr., 2000
- Most tech savvy folks
- Many companies have work to enhance privacy for customers with Encryption
- Cryptography is the art and science of hiding data in plain sight – Larry Loen
- Hacking?
- Web site operators pay thousands and sometimes millions for privacy audits.
- Checking for leaks of information, review of company's privacy policy and its compliance with policy
- [Truste](#)

# **Diverse Privacy Topics (cont.)**

## **Children:**

- Logging Activity on Internet
- Cell phone enable parents to check child's physical location
- Devices in car tell parents where teens are and how FAST they are driving
- RFID in shoes & Clothes

# Diverse Privacy Topics (cont.)

## Children:

- The Internet
  - Not able to make decisions on when to provide information
  - Vulnerable to online predators
- Parental monitoring
  - Software to monitor Web usage
  - Web cams to monitor children while parents are at work
  - GPS tracking via cell phones or RFID

# **Diverse Privacy Topics**

## **Discussion Questions**

- Is there information that you have posted to the Web that you later removed? Why did you remove it? Were there consequences to posting the information?
- Have you seen information that others have posted about themselves that you would not reveal about yourself?

# **Privacy and Computer Technology Discussion Questions**

- What is the impact of GPS-equipped children's' wrist watches?
- What is the impact of cell phones that provide tracking information to parents?
- Is it legal for someone to search your computer?
- Is it legal for someone to read your email?



# PROTECTING PRIVACY

## Technology and Markets:

### ✓ **Awareness:**

Most people have figured out now you can't do anything on the web without leaving a record.

- We can decide to what extent we wish to use privacy-protecting tools.
- We can be more careful about the information we give out, and the privacy policies of sites we use or visit.

# PROTECTING PRIVACY

## Technology and Markets:

### ✓ Privacy-enhancing technologies for consumers

- New applications of technology often can solve problems that arise as side effects of technology.
- Example: cookie disablers, blocking pop-up ads, scanning PCs for spyware, etc.
- Using usernames and passwords for Blogs visitors (family , friends, etc.).

# PROTECTING PRIVACY

## Technology and Markets:

### ✓ Encryption

- Information sent to and from websites can be intercepted.
- Someone who steals a computer or hacks into it can view files on it .
- Encryption is a technology that transforms data into a form that that is meaningless to anyone who might intercept or view it.

# PROTECTING PRIVACY

## Technology and Markets:

### ✓ Encryption

- Encryption generally includes a coding scheme, or cryptography algorithm, and specific sequences of characters (digits or letters).
- **Public-key cryptography:** An encryption scheme, where two related keys are used.
  - A key to encrypt messages.
  - A key to decrypt messages.

# PROTECTING PRIVACY

## Technology and Markets:

### ✓ **Business tools and policies for protecting privacy**

- Well- designed database.
- Using privacy audits to check for leaks of information, review the company's privacy policy , etc.
- Some large companies like IBM and Microsoft, use their economic influence to improve consumer privacy on the web, by removing ads from their web sites.

# PROTECTING PRIVACY (CONT.)

Rights and laws:

Theories

- **Warren and Brandeis: The inviolate personality**
  - Warren and Brandeis criticized newspapers especially for the gossip columns.
  - People have the right to prohibit publications of facts (and photos) about themselves.
  - Libel, slander and defamation laws protect us when someone spreads false and damaging rumors about us. But they do not apply to true personal information.
  - Privacy is distinct and needs its own protection.

# PROTECTING PRIVACY (CONT.)

**Rights and laws:**

**Theories**

- **Thomson: Is there a right to privacy?**
  - Thomson argues the opposite point of view.
  - There is no violation of privacy without violation of some other right, such as the right to control our property or our person, the right to be free from violent attacks, the right to form contracts (and expect them to be enforced).

# **PROTECTING PRIVACY (CONT.)**

**Rights and laws:**

**Theories**

- **Criticism of both theories ?**



# PROTECTING PRIVACY (CONT.)

## Rights and laws:

## Applying the theories:

- Many court decisions since Warren and Brandeis article, have taken their point of view.
- A person may win a case if someone published his/her consumer profile.
- Warren and Brandeis (and court decisions) allow disclosure of personal information to people who have an interest in it.
- An important aspect: consent.

# PROTECTING PRIVACY (CONT.)

## Rights and laws:

### Transactions

- Privacy includes control of information about oneself.
- How to apply privacy notions to transactions, Which involve more than one person?

# PROTECTING PRIVACY (CONT.)

## Rights and laws:

### Ownership of personal data

- People should be given property rights in information about themselves.
- But some activities and transactions involve at least two people, each of whom would have claims to own the information about the activity.
- Can we own our profiles (collection of data describing our activities, purchase, interests, etc.) ?
  - We cannot own the fact that our eyes have a certain color !

# PROTECTING PRIVACY (CONT.)

## Rights and laws:

### Regulation

- Technical tools for privacy protection, market mechanisms, and business policies are not perfect.
- Regulation is not perfect either.
- Some Regulations may be so expensive and difficult to apply.
- Example: Health Insurance Portability and Accountability Act (HIPAA)

# PROTECTING PRIVACY (CONT.)

## Rights and laws: Contrasting Viewpoints:

### Free Market View

- Freedom of consumers to make voluntary agreements
- Diversity of individual tastes and values
- Response of the market to consumer preferences
- Usefulness of contracts
- Flaws of regulatory solutions

# **PROTECTING PRIVACY (CONT.)**

## **Rights and laws: Contrasting Viewpoints (cont.):**

### **Consumer Protection View**

- Uses of personal information
- Costly and disruptive results of errors in databases
- Ease with which personal information leaks out
- Consumers need protection from their own lack of knowledge, judgment, or interest

# **PROTECTING PRIVACY (CONT.)**

## **Privacy Regulations in the European Union (EU):**

### **Data Protection Directive**

- More strict than U.S. regulations
- Abuses still occur
- Puts requirements on businesses outside the EU

# **PROTECTING PRIVACY DISCUSSION QUESTION**

**How would the free-market view and the consumer protection view differ on errors in Credit Bureau databases?**

**Who is the consumer in this situation?**



# COMMUNICATION

## Wiretapping and E-mail Protection:

### Telephone

- 1934 Communications Act prohibited interception of messages
- 1968 Omnibus Crime Control and Safe Streets Act allowed wiretapping and electronic surveillance by law-enforcement (with court order)

### E-mail and other new communications

- Electronic Communications Privacy Act of 1986 (ECPA) extended the 1968 wiretapping laws to include electronic communications, restricts government access to e-mail

# **COMMUNICATION**

## **(CONT.)**

### **Designing Communications Systems for Interception:**

#### **Communications Assistance for Law Enforcement Act of 1994 (CALEA)**

- Telecommunications equipment must be designed to ensure government can intercept telephone calls
- Rules and requirements written by Federal Communications Commission (FCC)

# **COMMUNICATION (CONT.)**

## **Secret Intelligence Gathering:**

### **The National Security Agency (NSA)**

- Foreign Intelligence Surveillance Act (FISA) established oversight rules for the NSA

### **Secret access to communications records**

# **COMMUNICATION (CONT.)**

## **Encryption Policy:**

**Government ban on export of strong encryption software in the 1990s (removed in 2000)**

# COMMUNICATION DISCUSSION QUESTIONS

What types of communication exist today that did not exist in 1968 when wiretapping was finally approved for law-enforcement agencies?

What type of electronic communications do you use on a regular basis?