



Computer Ethics

- Computers are involved to some extent in almost every aspect of our lives
 - They often perform life-critical tasks
- Computer science is not regulated to the extent of medicine, air travel, or construction zoning
- Therefore, we need to carefully consider the issues of ethics



Ethics

- Ethics are standards of moral conduct
 - Standards of right and wrong behavior
 - A gauge of personal integrity
 - The basis of trust and cooperation in relationships with others



Ethical Principles

- Ethical principles are tools that are used to think through difficult situations.
- Three useful ethical principles:
 - An act is ethical if all of society benefits from the act.
 - An act is ethical if people are treated as an end and not as a means to an end.
 - An act is ethical if it is fair to all parties involved.



Computer Ethics

- Computer ethics are morally acceptable use of computers
 - i.e. using computers appropriately
- Standards or guidelines are important in this industry because technology changes are outstripping the legal system's ability to keep up



Ethics for Computer Professionals

Computer Professionals:

- Are experts in their field,
- Know customers rely on their knowledge, expertise, and honesty,
- Understand their products (and related risks) affect many people,
- Follow good professional standards and practices,
- Maintain an expected level of competence and are up-to-date on current knowledge and technology, and
- Educate the non-computer professional



Computer Ethics

- Four primary issues
 - **Privacy** – responsibility to protect data about individuals
 - **Accuracy** - responsibility of data collectors to authenticate information and ensure its accuracy
 - **Property** - who owns information and software and how can they be sold and exchanged
 - **Access** - responsibility of data collectors to control access and determine what information a person has the right to obtain about others and how the information can be used



Problems with Large Databases

- Spreading information **without consent**
 - Some large companies use medical records and credit records as a factor in important personnel decisions
- Spreading **inaccurate** information
 - Mistakes in one computer file can easily migrate to others
 - Inaccurate data may linger for years



U.S. Federal Privacy Laws

General Federal Privacy Laws:

- Freedom Of Information Act, 1968
- Privacy Act Of 1974
- Electronic Communications Privacy Act Of 1986
- Computer Matching And Privacy Protection Act Of 1988
- Computer Security Act Of 1987
- Federal Internet Privacy Protection Act Of 1997



U.S. Federal Privacy Laws

Privacy Laws Affecting Private Institutions:

- Fair Credit Reporting Act, 1970
- Right To Financial Privacy Act Of 1978
- Privacy Protection Act Of 1980
- Cable Communications Policy Act Of 1984
- Electronic Communications Privacy Act Of 1986
- Video Privacy Protection Act Of 1988
- Consumer Internet Privacy Protection Act Of 1997
- Communications Privacy & Consumer Empowerment Act Of 1997
- Data Privacy Act Of 1997



Cyber Laws of India

- Section 65 – Tampering with computer Source Documents
- Section 66 - Using password of another person
- Section 66D - Cheating Using computer resource
- Section 66E - Publishing private Images of Others



Cyber Laws of India

- Section 66F - Acts of cyber Terrorism
- Section 67 - Publishing Child Porn or predating children online
- Section 69 - Govt.'s Power to block websites
- Section 43A - Data protection at Corporate level

<https://infosecawareness.in/cyber-laws-of-india>



Private Networks

- Employers may legally monitor electronic mail
 - In 2001, 63% of companies monitored employee Internet connections including about two-thirds of the 60 billion electronic messages sent by 40 million e-mail users.
- Most online services reserve the right to censor content
- These rights lead to contentious issues over property rights versus free speech and privacy



The Internet and the Web

- Most people don't worry about email privacy on the Web due to *illusion of anonymity*
 - Each e-mail you send results in at least 3 or 4 copies being stored on different computers.
- Web sites often load files on your computer called *cookies* to record times and pages visited and other personal information
- ***Spyware*** - software that tracks your online movements, mines the information stored on your computer, or uses your computer for some task you know nothing about.



General Internet Issues

- Inflammatory interchange of messages via internet (email, chat rooms, etc.)
- Chain mail
- Virus warning hoaxes
- “Spam” – unsolicited, bulk email



E-Mail Netiquette

- Promptly respond to messages.
- Delete messages after you read them if you don't need to save the information.
- Don't send messages you wouldn't want others to read.
- Keep the message short and to the point.
- Don't type in all capital letters.
- Be careful with sarcasm and humor in your message.



Internet Content & Free Speech Issues

- Information on internet includes hate, violence, and information that is harmful for children
 - How much of this should be regulated?
 - Do filters solve problems or create more?
- Is web site information used for course work and research **reliable**?



Information Ownership Issues

- Illegal software copying (pirating)
- Infringement of copyrights by copying of pictures or text from web pages
- Plagiarism by copying text from other sources when original work is expected



Terms

INTELLECTUAL PROPERTY:

Intangible creations protected by law

TRADE SECRET:

Intellectual work or products belonging to a business, not in public domain

COPYRIGHT:

Statutory grant protecting intellectual property from copying by others for 28 years

PATENT:

Legal document granting owner exclusive monopoly on an invention for 17 years



Copyright Laws

- Software **developers** (or the companies they work for) own their programs.
- Software **buyers** only own the right to use the software according to the license agreement.
- No copying, reselling, lending, renting, leasing, or distributing is legal without the software owner's permission.



Software Licenses

- There are four types of software licenses:
 - Public Domain
 - Freeware
 - Shareware
 - All Rights Reserved



Public Domain License

- Public domain software has no owner and is not protected by copyright law.
- It was either created with public funds, or the ownership was forfeited by the creator.
- Can be copied, sold, and/or modified
- Often is of poor quality/unreliable



Freeware License

- Freeware is copyrighted software that is licensed to be copied and distributed without charge.
- Freeware is free, but it's still under the owner's control.
- Examples:
 - Eudora Light
 - Netscape



Shareware License

- A shareware software license allows you to use the software for a trial period, but you must pay a registration fee to the owner for permanent use.
 - Some shareware trials expire on a certain date
 - Payment depends on the honor system
- Purchasing (the right to use) the software may also get you a version with more powerful features and published documentation.



All Rights Reserved License

- May be used by the purchaser according the exact details spelled out in the license agreement.
- You can't legally use it--or even possess it-- without the owner's permission.



Software Piracy

- SPA (Software Publishers Association) polices software piracy and mainly targets:
 - Illegal duplication
 - Sale of copyrighted software
 - Companies that purchase single copies and load the software on multiple computers or networks
- They rely on whistle-blowers.
- Penalties (for primary user of PC) may include fines up to \$250,000 and/or imprisonment up to 5 years in jail



System Quality

- Bug-free software is difficult to produce
- It must be carefully designed, developed, and tested
- Mistakes generated by computers can be far reaching
- Commenting and documenting software is required for effective maintenance throughout the life of the program



System Quality

ETHICAL ISSUES:

When is software, system or service ready for release?

SOCIAL ISSUES:

Can people trust quality of software, systems, services, data?

POLITICAL ISSUES:

Should congress or industry develop standards for software, hardware, data quality?



Computer Crime

- Computer criminals -using a computer to commit an illegal act
- Who are computer criminals?
 - Employees – disgruntled or dishonest --the largest category
 - Outside users - customers or suppliers
 - “Hackers” and “crackers” - hackers do it “for fun” but crackers have malicious intent
 - Organized crime - tracking illegal enterprises, forgery, counterfeiting



Types of Computer Crime

- Damage to computers, programs or files
 - Viruses - migrate through systems attached to files and programs
 - Worms - continuously self-replicate
- Theft
 - Of hardware, software, data, computer time
 - Software piracy - unauthorized copies of copyrighted material
- View/Manipulation
 - "Unauthorized entry" and "harmless message" still illegal



Computer Security

- Computer security involves protecting:
 - information, hardware and software
 - from unauthorized use and damage and
 - from sabotage and natural disasters



Measures to Protect Computer Security

- Restricting access both to the hardware locations (physical access) and into the system itself (over the network) using firewalls
- Implementing a plan to prevent break-ins
- Changing passwords frequently
- Making backup copies
- Using anti-virus software
- Encrypting data to frustrate interception
- Anticipating disasters (disaster recovery plan)
- Hiring trustworthy employees



Computer Ethics for Computer Professionals

- **Competence**— Professionals keep up with the latest knowledge in their field and perform services only in their area of competence.
- **Responsibility**— Professionals are loyal to their clients or employees, and they won't disclose confidential information.
- **Integrity**— Professionals express their opinions based on facts, and they are impartial in their judgments.



The ACM Code of Conduct

- According to the Association for Computing Machinery (ACM) code, a computing professional:
 - **Contributes to society and human well-being**
 - **Avoids harm to others**
 - **Is honest and trustworthy**
 - **Is fair and takes action not to discriminate**
 - **Honors property rights, including copyrights and patents**
 - **Gives proper credit when using the intellectual property of others**
 - **Respects other individuals' rights to privacy**
 - **Honors confidentiality**



Quality of Life Issues

- Rapid Change:
 - Reduced response time to competition
- Maintaining Boundaries:
 - Family, work, leisure
- Dependence And Vulnerability
- Employment:
 - Re-engineering job loss
- Equity & Access:
 - Increasing gap between haves and have nots
- Health Issues



Ergonomics

- Ergonomics:
 - helps computer users to avoid
 - physical and mental health risks
 - and to increase
 - productivity



Physical Health Issues

- Avoid eyestrain and headache
 - Take regular breaks every couple of hours
 - Control ambient light and insure adequate monitor brightness
- Avoid back and neck pain
 - Have adjustable equipment with adequate back support
 - Keep monitor at, or slightly below eye level



Physical Health Issues

- Avoid effects of electromagnetic fields (VDT radiation)
 - Possible connection to miscarriages and cancers, but no statistical support yet
 - Use caution if pregnant
- Avoid repetitive strain injury (RSI)
 - Injuries from fast, repetitive work
 - Carpal tunnel syndrome (CTS) - nerve and tendon damage in hands and wrists



The Environment

- Microcomputers are the greatest user of electricity in the workplace
- “Green” PCs
 - System unit and display - minimize unnecessary energy consumption and power down when not in use
 - Manufacturing - avoids harmful chemicals in production, focus on chlorofluorocarbons (CFC's) which some blame for ozone layer depletion



Personal Responsibility of Users

- **Conserve**

- Turn computers off at end of work day
- Use screen savers

- **Recycle**

- Most of the paper we use is eligible
- Dispose of old parts via recycling programs – most computer parts are dangerous in landfills

- **Educate**

- Know the facts about ecological issues