Introduction to Computer Ethics

Software Engineering Professional Ethics

Course Teacher: Debabrata Mallick (DM)

Background Of Ethics

- **Ethics: a set of beliefs about right and wrong behavior.**
- According to Socrates (Greek philosopher, 477 - 399 BC):People will naturally do what is good, if they know what is right
- Evil or bad actions (Hacking Cyber Crimes)are the result of unawareness about right and wrong
- so, if a criminal were truly aware of the mental and spiritual consequences of his actions, he would neither commit nor even consider committing them
- therefore, any person who knows what is truly right will

Definition

- Ethics: “The science of morals; the department of study concerned with the principles of human duty. The moral principles by which a person is guided.” – Oxford English Dictionary
- Moral: “Of or pertaining to character or disposition, considered as good or bad, virtuous or vicious; of or pertaining to the distinction between right and wrong, or good and evil, in relation to the actions, volitions, or character of responsible beings; ethical.” – Oxford English Dictionary
- Terms will be used interchangeably – basically, knowing the difference between right and wrong.

Introduction

- In the industrialized world computers are changing everything: from education to health, from voting to making friends or making war.
- Developing countries can also fully participate in cyberspace and make use of opportunities offered by global networks.
- We are living a technological and informational revolution.
- It is therefore important for policy makers, leaders, teachers, computer professionals and all social thinkers to get involved in the social and ethical impacts of this communication technology.

Computer Ethics

- The components of an ethical computer system are responsibility, ownership, access and personal privacy.
  - Responsibility concerns the accuracy and accountability of the information (using information properly)
  - Ownership deals with who has the right to use the information (information belongs to)
  - Access deals with who is allowed to use, view, store and process the information. (eligible to use information)
  - Personal privacy addresses the question of who the information belongs to (respect of personal information)

Impact of Cyber-Crime
1. Fraud and **Embezzlement**

- The most significant losses to businesses from computer crime come from employees.
- Losses from credit card fraud are estimated to be between $1and $4 billion per year.
- ATM fraud accounts for losses of about $60 million a year
- Telecommunications fraud estimated around $1 to $9 billion each year.
- Why? *Tradeoff between convenience and security*

2. Sabotage and Information Theft

- Direct destruction of hardware, software or information
- Use of “logic bombs”
- An employee fired from an insurance company was convicted for destroying more than 160,000 records.
- British Airways paid a competitor $4 million after hacking into their computers and stealing passenger lists.
- Identity Theft (Information Collection, Privacy

3. Hacking and Cracking

- Kevin Mitnick, a notorious hacker, was arrested in 1995.
  He allegedly stole thousands of files from a computer security expert, credit card numbers, and unreleased software. (Book: *Takedown* by T. Shimomura)
- High-Tech Low-Tech tricks:
- Social Engineering, Shoulder Surfing
- Clifford Stoll's *The Cuckoo's Egg* written about tracking a German hacker.
- In the 1970's John Draper discovered that the whistle in a cereal box could be used to fool the telephone system into giving free long-distance calls.

Cyberethics and cyber-technology

- **Cyber-technology** refers to a broad range of technologies from stand-alone computers to the cluster of networked computing, information and communication technologies.
- **Cyber-ethics** is the field of applied ethics that examines moral, legal, and social issues in the development and use of Cyber-technology.
- Internet ethics and information ethics.

Computer ethics: definition

- Same as cyber-ethics, or
- The study of ethical issues that are associated primarily with computing machines and the computing profession.
- The field of applied professional ethics dealing with ethical problems transformed, or created by computer technology

Computer Ethics: Some historical milestones

- 1940-1950: Founded by MIT prof Norbert Wiener: cybernetics-science of information feedback systems.
- 1960s: Donn Parker from California examined unethical and illegal uses of computers by professionals. 1st code of professional conduct for the ACM.
- 1970: Joseph Weizenbaum, prof at MIT, created Eliza.
- Mid 1970: Walter Maner taught 1st course and starter kit in computer ethics.

Computer ethics history (cont.)

- 1980: Issues like computer-enabled crime, disasters, invasion of privacy via databases, law suits about software ownership became public.
- Mid 80s: James Moore of Darmouth, Deborah Johnson of Rensselaer, Sherry Turkle of MIT, and Judith Perrole published article and books.

Computer ethics history (cont.)

- 1990: Interest in computer ethics as a field of research had spread to Europe and Australia.
- Simon Rogerson of De Montfort University (UK) Terrell Bynum, editor of Metaphilosophy (USA), initiated international conferences.
- Mid 90s: Beginning of a 2nd generation of computer ethics with more practical action.
- 2004: Interest spreads to Cotonou, Benin

Any unique moral issues? Deborah Johnson: Ethics on-line

- The ***scope*** of the Internet is **global** and **interactive**.
- The Internet enables users to interact with **privacy**.
- Internet technology makes the **reproducibility** of information possible in ways not possible before.
- The above features make behavior on-line morally different than off-line.

The debate continues:

- James Moore: Computer technology is “logically malleable” unlike previous technologies. It can create “new possibilities for human action”.
- Brey: disclosing non-obvious features embedded in computer systems that can have moral implications.
- Alison Adams: Take into account gender-related biases. Combine feminist ethics with empirical studies.

Sample topics in computer ethics

- Computers in the workplace: a threat to jobs? De- skilling? Health and safety?
- Computer security: Viruses. Spying by hackers.
- Logical security:
  Privacy, integrity, consistency, controlling access to resources.
- Software ownership: Intellectual property vs. open source.
- Software development: quality, safety