COMPUTER ETHICS & PUBLIC POLICY

LECTURE 1

Course Structure

- Lectures: 3
- Tutorial: 0
- Practical: 0
- Credit: 3

Books

- Johnson, Deborah G. (2001). Computer ethics, 3rd edition. Upper Saddle River, NJ: Prentice Hall. A philosophical survey of the ethical issues arising around computer technology.

- Moor, James H. (1985). "What Is Computer Ethics?" Metaphilosophy 16(4): 266–275. Classic piece on why the study of computer ethics is needed.

- Advisory Committee on Automated Personal Data Systems. Records, Computers, and the Rights of Citizens. U. S. Department of Health, Education, and Welfare Publication No. (OS) 73–94, July 1973.

Course Contents

- https://iiitsurat.ac.in/assets/syllabus/UGCSE/old/sem-7_CSE.pdf

CS 731: UNIT 1

What is Computer Ethics?

- Computer ethics is the analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology.
- Broadly, “computer technology” includes computers and associated technology.
    - For instance, it includes software, hardware, concerns about networks connecting computers and computers themselves.

What is Computer Ethics? (Contd.)

- Problem in computer ethics arises because there is a policy vacuum about how computer technology should be used.
- Computers provide us with new capabilities and these in turn give us new choices for action.
- Either no policies for conduct in these situations exist or existing policies seem inadequate.
- A central task of computer ethics is to determine what we should do in such cases, i.e., to formulate policies to guide our actions.
- Computer ethics includes consideration of both personal and social policies for the ethical use of computer technology.

What is Computer Ethics? (Contd.)

- An example of conceptual work is as follows:
  - Let's suppose we are trying to formulate a policy for protecting computer programs.
  - Initially, the idea may seem clear enough: Looking for a policy for protecting a kind of intellectual property.
  - But then a number of questions which do not have obvious answers emerge.
    - What is a computer program?
    - Is it really intellectual property which can be owned or is it more like an idea, an algorithm, which is not owned by anybody?
    - If a computer program is intellectual property, is it an expression of an idea that is owned (traditionally protectable by copyright) or is it a process that is owned (traditionally protectable by patent)?
    - Is a machine-readable program a copy of a human-readable program?
  - These questions must be answered in order to formulate a useful policy for protecting computer programs

What is Computer Ethics? (Contd.)

- The mark of a basic problem in computer ethics is one in which computer technology is essentially involved and there is an uncertainty about what to do and even about how to understand the situation.
- Hence, not all ethical situations involving computers are central to computer ethics.

What is Computer Ethics? (Contd.)

- Importance of general ethics and science to computer ethics.
- Ethical theory provides categories and procedures for determining what is ethically relevant.
  - For example, what kinds of things are good?
  - What are our basic rights?
  - What is an impartial point of view?
  - These considerations are essential in comparing and justifying policies for ethical conduct.
- Scientific information is crucial in ethical evaluations as ethical disputes turn not on disagreements about values but on disagreements about facts.

What is Computer Ethics? (Contd.)

- Computer ethics is a dynamic and complex field of study which considers
  - the relationships among facts,
  - conceptualizations,
  - policies and values with regard to constantly changing computer technology.
- Computer ethics is neither a fixed set of rules nor is computer ethics the rote application of ethical principles to a value-free technology.
- Computer ethics requires us to think anew about the nature of computer technology and our values.
- Computer ethics is a field between science and ethics and depends on them, it is also a discipline in its own right which provides both conceptualizations for understanding and policies for using computer technology.

Anatomy of Computer Revolution

- Computer Revolution follows two stage development:
  - The introduction stage, has been occurring during the last forty years.
    - Electronic computers have been created and refined.
  - The permeation stage,
    - Computer technology will become an integral part of institutions throughout our society.
- Many human activities and social institutions will be transformed by computer technology and that this transforming effect of computerization will raise a wide range of issues for computer ethics.

Anatomy of Computer Revolution (Contd.)

- Examples of Transforming effect of Computer Technology are:
  - Electoral Process
    - "How efficiently do computers count votes in a fair election?" but "What is a fair election?"
  - Businesses
    - How well do computers help us work?" but "What is the nature of this work?"

Anatomy of Computer Revolution (Contd.)

- Financial Institutions
  - "How well do computers count money?" but "What is money?"
  - Has money disappeared in favor of computer records or have electronic impulses become money?
  - What opportunities and values are lost or gained when money becomes intangible?
- Education
  - "How well do computers educate?”
  - "What is education?"
  - How much human contact is necessary or desirable for learning?
  - What is education when computers do the teaching?

Anatomy of Computer Revolution (Contd.)

- During the Computer Revolution many of our human activities and social institutions will be transformed.
- These transformations will leave us with policy and conceptual vacuums about how to use computer technology.
- Such policy and conceptual vacuums are the marks of basic problems within computer ethics.
- Therefore, computer ethics is a field of substantial practical importance.

The Invisibility Factor

- Invisible abuse is a one of the kind of invisibility factor.
- Invisible abuse is the intentional use of the invisible operations of a computer to engage in unethical conduct.
- Example: A programmer who realized he could steal excess interest from a bank.
- Although an ordinary case of stealing, it is relevant to computer ethics in that computer technology is essentially involved.
- There is a question about what policy to institute in order to best detect and prevent such abuse.
- Without access to the program used for stealing the interest or to a sophisticated accounting program such an activity may easily go un-noticed.

The Invisibility Factor (Contd.)

- A second variety of the invisibility factor is of invisible programming values.
- Invisible programming values are those values which are embedded in a computer program.
- A computer program is made at a level of abstraction usually far removed from the details of the actual programming language.
- In order to implement a program which satisfies the specifications a programmer makes some value judgments about what is important and what is not. These values become embedded in the final product and may be invisible to someone who runs the program.
- For example, computerized airline reservations.

The Invisibility Factor (Contd.)

- A third variety of the invisibility factor is invisible complex calculation.
- Computers today are capable of enormous calculations beyond human comprehension.
- Example: Four color conjecture.
  - The four color problem is to show that a map can be colored with at most four colors so that no adjacent areas have the same color.
  - What is interesting about this mathematical proof, compared to traditional proofs, is that it is largely invisible.
  - The general structure of the proof is known and found in the program and any particular part of the computer's activity can be examined, but practically speaking the calculations are too enormous for humans to examine them all.

The Invisibility Factor (Contd.)

- The issue is how much we should trust a computer's invisible calculations.
- For instance,
  - Computers are used by the military in making decisions about launching nuclear weapons.
  - Computers are fallible and there may not be time to confirm their assessment of the situation.
  - What should be our policy about trusting invisible calculations?

The Invisibility Factor (Contd.)

- Dilemma: Computers can make the invisible visible. Information which is lost in a sea of data can be clearly revealed with the proper computer analysis. But, that's the catch. We don't always know when, where, and how to direct the computer's attention.
- The challenge for computer ethics is to formulate policies which will help us deal with the dilemma.
- Decide when to trust computers and when not to trust them.
- This is another reason why computer ethics is so important.

Thank You