CSI 2911

Professional Practice In Computer Science

Ethical, social, and professional aspects of the modern computing technology

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Introduction

- Why this class?
- Textbook, other material
- Marking
- Course plan
- NOTE: we use, in part, slides supplied by the textbook author
- Bilingualism

Examples of questions

we will answer in this course:

- How do I as a software developer/designer decide what is and what is not ethical professional behavior?
- if you write a program, and an error causes an accident – who is liable?
- Is Internet bringing people together, or they are isolated as they all sit in front of their computers?
- How is Google built – what's "inside"?
- How does Google make money?
- What is the difference between security and privacy?
- How did Macleans get details of cellphone use of the Privacy Commissioner?
- Does anonymization protect your data?
- Should software be free (linux?) or for sale (Microsoft?)
- What is digital divide?
- Are future technologies (nanotechnology, robotics) potentially dangerous?

Course plan

- Lecture 1
  - discuss the course, its position in the curriculum, syllabus, requirements, textbook, etc.
  - impact of ICT (Information and Computing Technologies) on different areas
  - introduction to Computer Ethics – J. Moor- (handout)
- Lecture 2 – ethics in ICT cont'd
  - operational – Bynum analysis –
  - Privacy - introduction

Course plan

- Lecture 3 Privacy – technology issues
  - Privacy vs security
  - Data mining
  - Medical data and privacy
  - Assignment 1 out
- Lecture 4 – Privacy & Internet
  - Cookies
  - Google suite
  - Internet and the public sphere
  - Electronic elections
  - Internet and state censorship
- Lecture 5 – Professional ethics and guidelines –
  - CIPS –Prof. T. Lethbridge
- Lecture 6 – legal issues of the software professional
  - Computer system failures – discussion and analysis

Course plan

- Lecture 7 – intellectual property (IP), software and the internet
  - Open source software
  - Creative commons publishing
- Lecture 8 midterm
- Lecture 9 – new technologies and social relations
- Lecture 10 - – work and new technologies
- Lecture 11- computer crime
  - Identity theft
- Lecture 12 – digital divide
- Lecture 13 – the future of the technological society
  - robot ethics
  - Course review, discussion of final exam

Impact of CS

- Automates uninteresting, repetitive tasks
- Provides cheap, instantaneous communication
- Allows almost unlimited information access
- Enhances productivity and quality
- Revolutionizes any area of human activity

Impact of CS:

- Human relationships:
  - Impact of constant connectivity?
  - Isolation vs e-communities (examples: chat groups, Facebook, ….)
  - Relationships?
  - Eliza, e.g.

    http://www.manifestation.com/neurotoys/eliza.php3

    Illusion of a conversation with a Rogerian psychotherapist. In fact, it's a very simple program that reacts to keywords and puts them in canned phrases

What We Will Cover

- Rapid Pace of Change
- New Developments and Dramatic Impacts
- Issues and Themes
- Ethics

Rapid Pace of Change

- 1940s: The first computer is built
- 1956: First hard-disk drive weighed a ton and stored five megabytes
- 1991: Space shuttle had a one-megahertz computer
- 2006: Pocket devices hold a terabyte (one trillion bytes) of data
- 2006: Automobiles can have 100-megahertz computers
- Is there a limit to Moore's law?

Rapid Pace of Change: Discussion Question

- What devices are now computerized that were not originally? Think back 10, 20, 50 years ago.

New Developments

Blogs (Word made up from ‘web log’):

- Began as outlets for amateurs who want to express ideas or creativity
- Appealing because present personal views, are funny and creative, and present a quirky perspective on current events

New Developments (cont.)

Blogs (cont.):

- Now used as alternatives to mainstream news and for business public relations
- Popular blogs have 100,000 to 500,000 readers per day and can peak at several million views per day

New Developments (cont.)

Video Sharing:

- Rise of amateur videos on the web
- Boom of websites like Youtube and Facebook, Myspace
- Many videos on the web can infringe copyrights owned by entertainment companies

New Developments (cont.)

Cell Phones:

- Can now be used for travel, last minute planning, taking pictures and downloading music
- Talking on cell phones while driving is a problem
- Cell phones can interfere with solitude, quiet and concentration
- Cameras in cell phones and privacy issues

New Developments (cont.)

Social Networking:

- First online social networking site was www.classmates.com in 1995
- Myspace, founded in 2003 had roughly 100 million member profiles by 2006
- Facebook was started at Harvard U. as an online version of student directories

New Developments (cont.)

Collaboration:

- Wikipedia, the online, collaborative encyclopedia
- Collaboration between scientists in different labs or countries

New Developments (cont.)

E-commerce and Free Stuff:

- Free stuff on the web: email, books, newspapers, games, etc.
- www.Amazon.com started in 1994 and annual sales reached $24 billion (2009)
- Ebooks are now 10% of book sales, but > 50% for some bestselling titles
- TV show episodes are available to view on the Web

New Developments (cont.)

Artificial Intelligence (AI), Robotics, Learning and Motion:

- AI can solve a number of expert, difficult tasks
- Robotic devices often special-purpose devices, and may require AI to function
- Machine Learning methods/algorithms enable adaptive systems

New Developments (cont.)

Tools for Disabled People:

- Restoration of abilities, productivity and independence
- Screen readers and scanners
- Speech recognition
- Prosthetics and motion sensors

New Developments (cont.)

What's Next?

- Medical records on chips attached to medical bracelets
- Biological and computer sciences will combine new ways to insert micro-processors or controlled devices on human bodies

New Developments (cont.) Discussion Question

- What changes and new developments do you expect in the next 50 years?
- How will life be different than it is today?

Issues and Themes

Issues:

- Unemployment
- Alienation and customer service
- Crime
- Loss of privacy
- Errors

Issues and Themes (cont.)

Themes:

- Old problems in a new context: crime, pornography, violent fiction
- Adapting to new technology: thinking in a new way
- Varied sources of solutions to problems: natural part of change and life

Issues and Themes (cont.)

Themes (cont.):

- Global reach of net: ease of communication with distant countries
- Trade-offs and controversy: increasing security means reducing convenience
- Difference between personal choices, business policies, and law

Ethics

What is Ethics:

- Study of what it means to “do the right thing”
- Assumes people are rational and make free choices
- Rules to follow in our interactions and our actions that affect others

Ethics (cont.)

Ethical Views:

- Deontological: actions good or bad (I. Kant);
  - People are the goal (ends), and not the means
- Utilitarianism: consequences
- Natural rights(Locke): life, liberty, freedom
- No simple answers
  - Do organizations (businesses) have ethics?

Ethics (cont.)

Important Distinctions:

- Right, wrong and okay
- Negative rights (liberties)
  - The right to act without interference
- Positive rights (claim-rights)
  - An obligation of some people to provide certain things for others

Ethics (cont.)

Important Distinctions (cont.):

- Difference between wrong and harm
- Personal preference and ethics
- Law and Ethics

Ethics
Discussion Question

- Can you think of examples of liberties (negative rights) and claim-rights (positive rights) that are at opposition to each other?

Moor's approach to computer ethics (paper 1)

- Critique of Routine Ethics and Cultural relativism
- Logical malleability of computing devices
- ICT is informationally enriched

Moor – common core values

- Life and happiness
- Ability, freedom, knowledge, resources, protection
- Example
  - 1 destroy info. on user's hard disk
  - 2 remove info from user's HD without their knowledge
  - 3 leave a cookie on the user HD without informing them
  - 4 leave a cookie on the user HD and inform them
  - 5 do not take or leave any info on user HD
  - 6 give the user ability to accept or decline cookies

Bynum's *operational* view

- What is the policy to guide our actions?
- How to determine whether there are policies that cover our case?
- How to develop new policies?
- How to judge ethically the new policies?

Policies for conduct

- 7 levels: international treaties and agreements, laws, regulations, standards of good practice, professional codes of ethics, corporate policies, community and personal values
- Eg in Privacy: Fair Information Practice Principles, PIPEDA, ON Freedom of Information and Protection of Privacy Act, ON Personal Health Information Protection Act, 2004 CIPS Guidelines, CIPS Code of Ethics, University of Ottawa policies, common sense,…

Ethical judgement

- Is a kind of “pattern recognition”…
- … and as such is gets better with experience

Method for Ethical Analysis

1. Take the ethical point of view: equality, justice (fairness, equal treatment), respect (Kant). Self-respect -> integrity
2. Gather all the ethically relevant facts regarding people involved: actions, roles, relationships (eg conflict of interest). This will take time!
3. Identify key issues, look for an existing “policy to guide one’s conduct”, apply this existing policy

4. Think of precedents and analogies (PR -> CBR)
5. Sensitivities
   - Who might object to this situation?
   - Why?
   - Use the identity of the objector + their reasons to focus on issues
   - Play role
6. Get advice

In addition, you can perform the following steps

- Professional standards analysis
- Roles and responsibilities analysis (ICT personnel)
- Stakeholders analysis
- Systematic policy analysis
- Ethical theory analysis

- Systematic policy analysis
  - International agreements
  - Corporate policies
- Ethical theory analysis
  - Utilitarian: benefit/harm
  - Aristotelian: virtues/vices
  - Kantian: respect for persons

- Conclusions – has anyone done anything wrong? Conflicting policies?
- Lessons for the future?