CIS 381: Social & Ethical Issues of Computing

Professional Ethics

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Net Neutrality

• What is net neutrality?
  - Require all Internet packets be treated the same
  - Companies cannot charge more for certain services or throttle selected content
• Supporters of tiered service say it is needed to support Voice-over-IP and other services
• Opponents to tiered service (e.g., Google, Yahoo!) say it would hurt small start-up companies and lower innovation
• Other critics believe companies controlling Internet might favor some content over other content
Net Neutrality History

• From 2004 through 2015, FCC classified internet service as an information service rather than a telecommunications service
• Sought to preserve net neutrality through various declarations, courts ruled against legality of FCC's enforcement based on these
• 2015: FCC reclassifies broadband as a telecommunications service (Open Internet Order): ISPs cannot block, throttle or fast lane users
• In 2017, FCC chairman Ajit Pai led “Restoring Internet Freedom” order to repeal 2015 rules
  - Currently 23 State Attorneys General suing order as a violation of federal law
  - Some states have passed legislation to protect net neutrality
  - Pai claims FCC has authority that trumps states/municipalities
  - ISPs must abide with state rules

[S. Abraham]
The Winner-Take-All Phenomenon

• Winner-take-all: a few top performers have disproportionate share of wealth
• Winner-take-all has long existed in sports, arts, and entertainment
• Gap between very good players and great players is not huge
• … but the difference in compensation/endorsements/etc. is huge
• More prevalent in all workplaces now

[M. J. Quinn]
Winner-Take-All

• Causes
  - IT and efficient transportation systems
  - Network economies
  - Dominance of English language
  - Changing business norms

• Possible ways to address this
  - Limit number of hours that stores remain open
  - Businesses form cooperative agreements to reduce positional arms races (e.g. salary caps on pro sports teams)
  - More progressive tax structures: difference in modern tax rates compared to the past
  - Campaign finance reform: limit political influence of wealthy
Critiques of the Digital Divide

• DD talk suggests the difference between “haves” and “have nots” is simply about access
• DD talk puts everyone in two categories, but reality is a continuum
• DD implies lack of access leads to less advantaged social position, but maybe it is the other way around
• Internet is not the pinnacle of information technology

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Watkins: "Navigating the Digital Edge"

- Digital divides or participation gaps?
- Statistics about access to technology
- How do race, class, gender, and geography influence digital media practices?
- "Contrary to popular opinion, young people are developing important social, technical, and civic skills while hanging out online"
- Mobile paradox: "Even as black and Latino youth are early adopters of mobile devices they are also less likely than white youth to grow up in households with access to broadband Internet."
- "The divide that deserves increasing attention from educators, media researchers, & practitioners is the 'digital literacy divide'."
Test 2

- Wednesday, April 10, in class
- Same format as Test 1
- More information and example questions posted on the web site
Assignment 7

• April 12:
  - No lecture at 9am
  - Attend CIS Seminar: Ralph Clifford, UMass Law School, 3-4pm, LIB 207
  - Talk on intellectual property
  - Write a reaction to the talk

• If you cannot attend the talk, I will provide another reading/video for A7 instead
Term Paper Presentation

- Presentation dates announced
- Topic presentations are done in **groups**, but each person should speak for 3-4 minutes
- Try to be **succinct** in discussion of the background and focus on the ethical issues and dilemmas
  - Can have one person summarize background (e.g. extra minute)
  - **All** should dig into the ethical issues and dilemmas
- Need to evaluate issues using **ethical frameworks**
- Groups can choose to examine different issues related to a topic or examine a similar issue using different frameworks
Professional Ethics

• How well developed are the computing professions?
• Software engineering code of ethics
• Analysis of the code
• Case studies
• Whistle-blowing
Professions

• **A profession** is a vocation that requires:
  - High level of education
  - Practical experience

• Professionals are generally well-compensated
  - Doctors
  - Lawyers

• We trust professionals to…
  - Correctly ascertain and treat problems
  - Take actions for the good of their clients
Characteristics of Mature Profession

- Initial professional education
- Accreditation
- Skills development
- Certification
- Licensing
- Professional development
- Code of ethics
- Professional society
Example: Certified Public Accountants

• Bachelor’s degree
  - 150+ semester hours
  - 24+ hours of accounting-related classes

• Two years’ experience working under supervision of a CPA

• CPA exam

• To retain certification
  - Continuing education
  - Follow code of ethics
How Do Computer-Related Careers Stack Up?

- Certification and licensing not required
- College degree not required
- Apprenticeship not required
- Membership in professional society optional
- No specific requirements for continuing education
- Most computer programmers, system analysts, etc. are part of teams
Status of Certification and Licensing

• Software engineer: someone engaged in development or maintenance of software, or teaches in this area

• Path to certification now exists: similar to path taken by engineers in other disciplines, such as civil engineering
  - Four years of post-college work experience
  - Pass Fundamentals of Engineering (FE) exam
  - Pass discipline-specific Principles & Practice of Engineering (PE) exam
  - PE exam in software available since 2013

• Very small percentage of software engineers have to be licensed
  - Those developing software that can affect health, safety, and welfare of the public
  - Those offering their services directly to the public

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Ability to Harm Public

• Many computer professionals hold responsibilities similar to those held by members of mature professions
• Therac-25 killed or gravely injured at least six people
• Millions rely upon software rather than accountants to prepare their tax returns
• Millions of people rely on system administrators to keep their work-related information secure
Importance of Taking Personal Responsibility

The ability to cause harm to members of the public is a powerful reason why those in computer-related careers must act according to ethical principles. Without universal certification and licensing and other components of a well-developed profession to rely upon, those in computer-related careers must take more personal responsibility for developing their ethical decision-making skills.
Software Engineering Code of Ethics
Preamble of Code

• Software engineers have opportunities to do good or do harm
• Software engineers ought to be committed to doing good
• Eight principles identify key ethical relationships and obligations within these relationship
• Code should be seen as a whole, not a collection of parts
• Concern for the public interest is paramount
Analysis of Preamble

- **No mechanical process** for determining if an action is right or wrong
- Should not take an overly *legalistic* view of the Code
  - If Code doesn’t forbid something, that doesn’t mean it is morally acceptable
  - Judgment required
- Code reflects principles drawn from multiple ethical theories
8 Principles for Morally Responsible Relationships

• Public
• Client and employer
• Product
• Judgment
• Management
• Profession
• Colleagues
• Self
Act Consistently with Public Interest

• 1.01 “Accept full responsibility for own work”
• 1.02 Balance competing interests
• 1.03 Approve software only if it is safe
• 1.04 Disclose actual/potential dangers
• 1.05 “Cooperate in efforts to address” public concerns
• 1.06 “Be fair and avoid deception in all statements”
• 1.07 Consider factors that diminish access to software
Act in Best Interest of Client, Employer

- 2.01 Act within areas of competence
- 2.02 Don’t use software obtained illegally
- 2.03 Only use property in authorized ways
- 2.04 Ensure documents are approved
- 2.05 Respect confidentiality
- 2.06 Promptly report problems with project
- 2.07 Report issues of social concern
- 2.08 Refuse outside work detrimental to job
- 2.09 Put employer’s/client’s interests first, unless overriding moral concern
Ensure Products Meet Highest Standards

• 3.01 Aim for “high quality, acceptable cost and a reasonable schedule,” making trade-offs clear
• 3.02 “Ensure proper and achievable goals”
• 3.03 Face up to “ethical, economic, cultural, legal and environmental” issues
• 3.04 Ensure you are qualified for proposed work
• 3.05 Use appropriate project methodologies
• 3.06 Follow the most appropriate professional standards
• 3.07 “Strive to fully understand the specifications”
• 3.08 Ensure the specifications are correct and approved
Ensure Products Meet Highest Standards

- 3.09 “Ensure realistic quantitative estimates of cost, scheduling, personnel, quality and outcomes”
- 3.10 “Ensure adequate testing, debugging, and review of software and related documents”
- 3.11 “Ensure adequate documentation”
- 3.12 Develop software and documents that respect privacy of those affected by software
- 3.13 Use only accurate data appropriately acquired
- 3.14 Maintain data integrity
- 3.15 Use same standards for software maintenance as software development
Maintain Integrity in Professional Judgment

- 4.01 “Temper all technical judgments by the need to support and maintain human values”
- 4.02 Understand and agree with documents before endorsing them
- 4.03 Remain objective when evaluating software or related documents
- 4.04 Do not engage in deceptive financial practices
- 4.05 Disclose conflicts of interest
- 4.06 Do not participate in decisions in which you, your employer, or your client has a potential conflict of interest
Promote Effective Project Management

- 5.01 Ensure good project management procedures
- 5.02 Ensure software engineers know standards
- 5.03 Ensure software engineers know policies and procedures for protecting confidential information
- 5.04 Take employees’ abilities into account before assigning work
- 5.05 Ensure reasonable estimates are made
- 5.06 Give full and accurate information to potential employees
Promote Effective Project Management

- 5.07 Pay employees fairly
- 5.08 Do not unjustly prevent a qualified person from taking a job
- 5.09 Work out fair intellectual property agreements
- 5.10 Provide employees charged with misconduct due process
- 5.11 Do not ask someone to do anything violating the Code
- 5.12 “Do not punish anyone for expressing ethical concerns about a project”
Advance the Profession

• 6.01 Help create an environment supporting ethical conduct
• 6.02 “Promote public knowledge of software engineering”
• 6.03 Participate in professional activities
• 6.04 Support others who are trying to follow this Code
• 6.05 Do not promote self-interest at expense of profession, client, or employer
• 6.06 Obey all laws unless there is an overriding public interest
• 6.07 Do not deceive others regarding the characteristics of software
Advance the Profession

• 6.08 Take responsibility for finding, correcting, and reporting errors in software and documentation
• 6.09 Ensure others know you are committed to the Code and what that means
• 6.10 Do not associate with businesses and organizations that are in conflict with Code
• 6.11 Understand violating the Code is inconsistent with being a professional
• 6.12 Share concerns about Code violations with the people involved
• 6.13 “Blow the whistle” when no alternative to reporting significant Code violations

[M. J. Quinn]
Be Fair to and Supportive of Colleagues

- 7.01 “Encourage colleagues to adhere to this Code”
- 7.02 “Assist colleagues in professional development”
- 7.03 Give others the credit they deserve
- 7.04 Be objective when reviewing the work of others
- 7.05 Give colleagues a fair hearing
- 7.06 Help colleagues remain aware of work practices
- 7.07 Do not unfairly interfere with another’s career, but protect the public interest
- 7.08 Bring in experts for situations outside your own area of competence.
Participate in Lifelong Learning

- 8.01 Stay current with developments in field
- 8.02 Improve ability to create high quality software
- 8.03 Improve ability to produce high quality documentation
- 8.04 Improve understanding of software and documentation used in work
- 8.05 Improve knowledge of relevant standards
- 8.06 Improve knowledge of this Code and its application
- 8.07 Do not treat others unfairly because of prejudices
- 8.08 Do not influence others to break the Code
- 8.09 “Recognize that personal violations of this Code are inconsistent with being a professional software engineer”
Alternative List of Fundamental Principles

• Be impartial.
• Disclose information that others ought to know.
• Respect the rights of others.
• Treat others justly.
• Take responsibility for your actions and inactions.
• Take responsibility for the actions of those you supervise.
• Maintain your integrity.
• Continually improve your abilities.
• Share your knowledge, expertise, and values.