
Ethics and Computing

— People-Oriented Computing —

9.12.2019

Agenda

- Ethics and Computing mini-lecture
 - History and challenge areas
 - Ethics codes
 - Study ethics and human participants
- Course evaluation results
- Exam preparation and tips

Learning Objectives

At the end of this lecture you should be familiar with:

- Basic history of the development of computer ethics
- Key challenge areas for computer ethics
- Selected codes of conduct for computing and computer use
- Foundational ethical concepts for studies involving human participants
- Basic understanding of informed consent and how to obtain it
- Basic understanding of vulnerable populations in studies involving human participants

COMPUTER ETHICS: HISTORY AND CHALLENGES

What is Computer Ethics?

"... ethical problems aggravated, transformed, or created by computer technology" – Walter Maner, 1970s

What is Computer Ethics?

“... 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” – James Moor, 1985

What is Computer Ethics?

"Computer Ethics identifies and analyzes the impacts of information technology on social and human values like health, wealth, work, opportunity, freedom, democracy, knowledge, privacy, security, and self-fulfillment, etc." – Terrell Ward Bynum, 1989

1940s and 1950s

- Norbert Wiener (MIT) helped developed anti-aircraft cannons to shoot down warplanes
- Drew several insights about the potential ethical impact of information systems
 - Computers might be able to sense information
 - Machines could be built to perform complicated tasks
- Identified key ethical questions for computing
- Predicted a second industrial revolution
- Predicted radical changes for workplaces, laws and regulation, businesses, professional organizations, psychology, and philosophy

1960s

- Donn Parker (SRI) began to study unethical and criminal use of computers by computer professionals
- Developed the first Code of Professional Conduct for the ACM

1970s

- Joseph Weizenbaum created ELIZA (1960s), a program that could imitate a psychotherapist to interact with a patient
- Program elicited strong responses
 - Psychiatrists believed computers would soon provide automated psychotherapy
 - Scholars became emotionally attached to the program
 - Fears that science would treat humans and machines as equal

1970s

Walter Maner begins to use the term “computer ethics”

- Developed university-level courses on computer ethics
- Published the Starter Kit in Computer Ethics which contains materials and advice for universities to implement computer ethics courses
- Increases interest and work in the field

1980s

- Social and ethical impacts of computing become public issues
 - Computer-enabled crime
 - Disasters caused by computer failures
 - Invasions of privacy via databases
 - Major lawsuits over software ownership
- First international conference on computer ethics takes place, bringing together computer professionals, philosophers, sociologists, psychologists, lawyers, business leaders, government officials, etc.

Topics in Computer Ethics

- Computers in the Workplace
- Computer Crime
- Privacy and Anonymity
- Intellectual Property
- Professional Responsibility & Globalization

Computers in the Workplace

- Computers can potentially replace people in jobs or reduce their need
- Computing also creates new jobs
- Computers can radically alter the nature and responsibilities of a job
- Computers and information technology can impact health and job satisfaction

Computer Crime

- Proliferation of fraud, viruses, spying, hacking
- Internal crimes such as embezzlement
- New policy and approaches needed to handle security and computer crime

Privacy and Anonymity

- Computers and networks can gather, store, search, compare, retrieve and share personal information
- People can no longer keep information fully confidential
- Lack of transparency about who has access to personal information
- Changing expectations and definitions of privacy

Intellectual Property

- Challenges concerning ownership of software and media
- Need for policy to mandate what is protected, e.g., code, algorithms, underlying ideas
- Strong financial interest in protection of software and other intellectual property

Professional Responsibility & Globalization

- Global networks and conglomerates connect people and information worldwide
- Affects global laws, global business, global education, global information flows
- Increasing “digital divide” between rich and poor nations
 - Educational opportunities, employment opportunities, medical services, and other necessities move into the digital realm, increasing the gap between rich and poor

ETHICS CODES

Ethics Codes

- Organizations and groups attempt to define codes of conduct and ethics that members should follow
- Impossible to cover all ethical issues; codes are tailored to organizations' priorities and focus
- Mirror some legal policy but are not law
- Challenging to regulate and enforce

Code of Fair Information Practices (1973)

Purpose to secure privacy and rights of citizens in regard to personal information

1. No personal data record-keeping systems should exist secretly
2. There must be a way for individuals to find out what information is kept on him/her and how it is being used
3. Any organization creating, maintaining using, or disseminating records of personal information must assure data reliability for its intended use and take precautions to prevent misuse
4. There must be a way for an individual to prevent personal information obtained for one purpose from being used for another purpose without consent.

DATA PRIVACY

Your Apps Know Where You Were Last Night, and They're Not Keeping It Secret

- Dozens of companies use smartphone locations to help advertisers and even hedge funds.
- They say it's anonymous, but the data shows how personal it is.

1h ago



Computer Ethics Institute (1991)

Purpose to guide ethical use of computers

1. Thou shalt not use a computer to harm other people
2. Thou shalt not interfere with other people's computer work
3. Thou shalt not snoop around in other people's computer files
4. Thou shalt not use a computer to steal
5. Thou shalt not use a computer to bear false witness
6. Thou shalt not copy or use proprietary software for which you have not paid
7. Thou shalt not use other people's computer resources without authorization
8. Thou shalt not appropriate other people's intellectual output
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing
10. Thou shalt always use a computer in ways that insure consideration and respect for your fellow humans

Association for Computing Machinery (Excerpt) (1992)

Purpose to specify conduct by computing professionals

- 1.1 Contribute to society and human well-being
- 1.2 Avoid harm to others
- 1.3 Be honest and trustworthy
- 1.4 Be fair and take action not to discriminate
- 1.5 Honor property rights including copyrights and patent
- 1.6 Give proper credit for intellectual property
- 1.7 Respect the privacy of others
- 1.8 Honor confidentiality

STUDY ETHICS

Tuskegee Syphilis Study

Conducted 1932-1972
by the U.S. Public Health
Service



Tuskegee Syphilis Study

- Studied natural progression of syphilis in African-American men
- Men were led to believe that they were receiving free healthcare from the government
- Study continued after funding for treatment was terminated
- Men were never informed that they were infected, were not treated with penicillin after it became available in the 1940s
- Many died of syphilis, 40 wives contracted the disease, and 19 children were born with it
- Led to the establishment of laws and regulations for the protection of human subjects in research

About Study Ethics

- During an informatics degree, most if not all of you will conduct research with human participants
 - E.g., a survey, interview, user test, observations
- Entails collecting data about people
- Whether formal or informal, the rights of human participants need to be considered and respected

Purpose of Study Ethics

- Protect your study participants
- Protect yourself and your organization
- Protect the data you are collecting

Right to be Informed

Participant has a right to be informed

- Purpose of the activity
- Procedures
- Use of information collected
- Incentives for participation
- Participant's rights
- Risks, discomforts, adverse effects

Informed Consent Forms

- Provide the potential participant with enough information that s/he understands what s/he is agreeing to
- Participant signs a form acknowledging understanding of the activity and agreement to participate

Informed Consent: Purpose

- Provide a high-level description of the research activity and its purpose
- Make participant comfortable with the study and data collection

Informed Consent: Procedure

- Provide a description of what the participant will be required to do
- Provide a description of what the researcher will be doing, if appropriate (i.e., taking notes, recording audio, etc.)

Informed Consent: Confidentiality

- How will participant information be protected
 - Anonymization of data
 - Pseudonyms or participant codes
 - Blurring of faces in images or videos
 - Removal of personally identifying data
- How will participant information be stored
 - E.g., password protected computer, locked cabinet
- Who will have access to data?
 - E.g., only the researchers involved in the study
- How may participant information be used
 - E.g., internal and external presentations, papers

Informed Consent: Data Storage

- In what form will data be stored?
- Where will data be kept?
- Who will have access to data?
- How long will data be kept?

Right to Withdraw

- Participants should not be coerced into participating
- Participants should not be penalized for withdrawing
- Incentives should be made explicit up front and should not be reduced as a result of withdrawal

Risks and Benefits

- Risks in many CS studies are minimal (e.g., no risks beyond those of normal computer use, no risks beyond those of normal daily activity)
- May include risks from physical activity
- Benefits may include compensation, incentive gift, helping to improve a product

Vulnerable Populations

Participants who may not be able to give full, voluntary informed consent

- Prisoners
- Children
- Persons with mental or physical disabilities
- Persons with economic or educational disadvantages
- People who are very ill
- People who are institutionalized

Other Possibly Vulnerable Populations

Other populations may be vulnerable in certain contexts, e.g.

- Students in a class
- Employees in a company
- Women in cultures or organizations in which they are regarded as lower status
- Racial/ethnic minorities in contexts in which they are regarded as lower status

Overall Guidelines for Study Ethics

- Minimize risks to participants
- Collect only as much personal information as necessary
- Inform participants about their participation and data use
- Provide incentives that are proportional to effort
- Allow participants to withdraw

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Personal or Study Related Problems?

Professional counseling can help you overcome difficult phases in life, troubles in your studies and conflicts arising during the course of doctoral study. We are here to offer effective support – also in the case of an acute crisis.

The counseling services are available to all students and PhD candidates at UZH and ETH Zurich. The sessions are confidential and free of charge. We speak German, English, French and Polish.

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We are open Monday through Friday – even during the semester break. You can an appointment by phone or E-Mail.

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Psychological Counseling Center

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COURSE SURVEY FEEDBACK

Study Participation

- N = 105 (~44% participation)
- 97.1% BSc, 2.9% MSc
- 87.6% WWF, 10.5% PhF, 1.9% MNF
- 29.8% female, 67.3% male, 1% “x”

Questions about the course

How satisfied are you with this course overall?



n=93

av.=3.7

md=4.0

dev.=1.4

Questions about the instructor

How satisfied are you with the instructor overall?



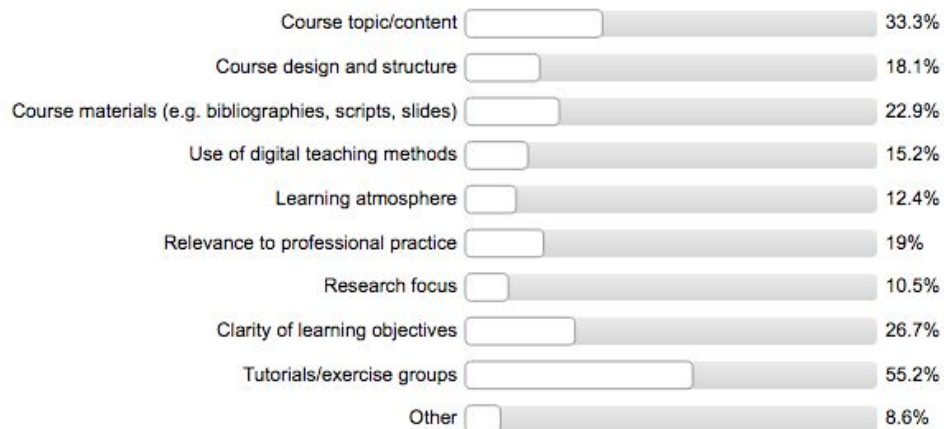
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av.=4.9

md=5.0

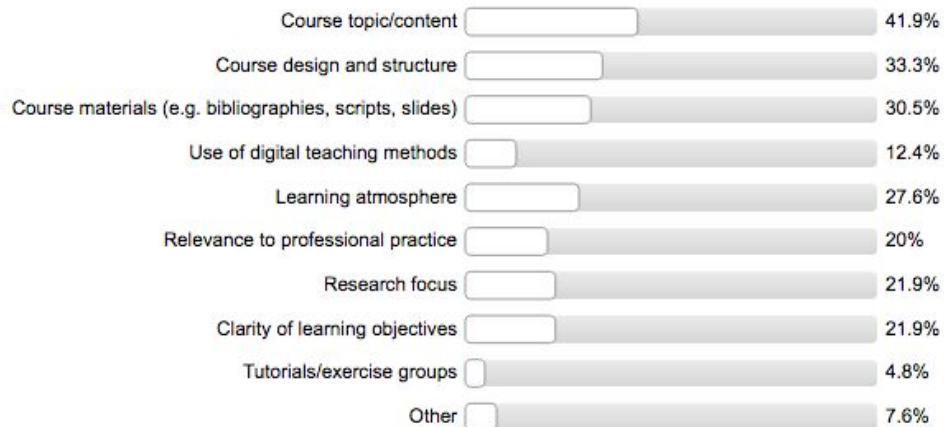
dev.=1.3

What aspects of this course do you think need improvement? (Check all answers that apply)



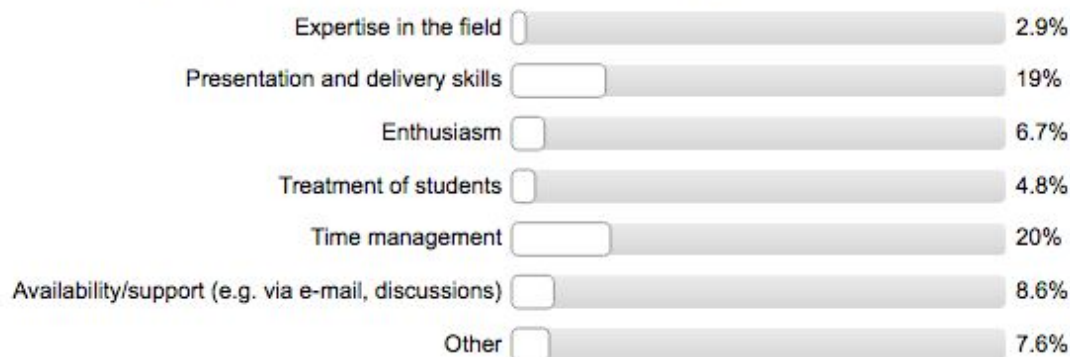
n=105

What aspects did you particularly like about this course? (Check all answers that apply)



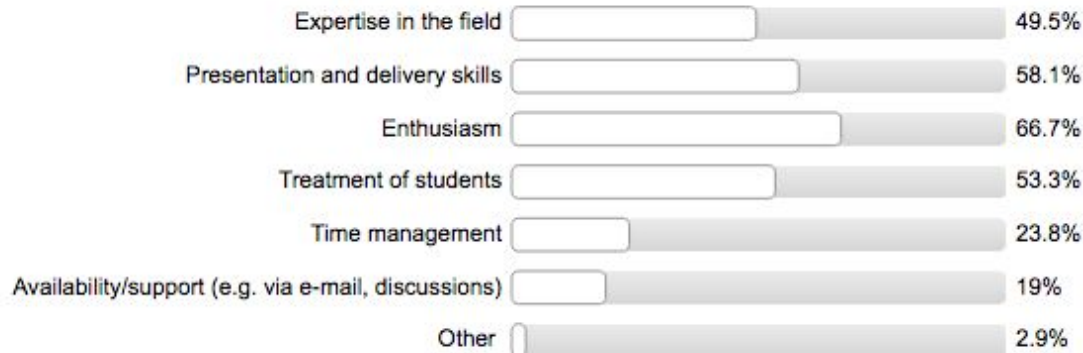
n=105

In what areas do you think the instructor needs improvement? (Check all answers that apply)



n=105

What aspects did you particularly like about the instructor? (Check all answers that apply)



n=105

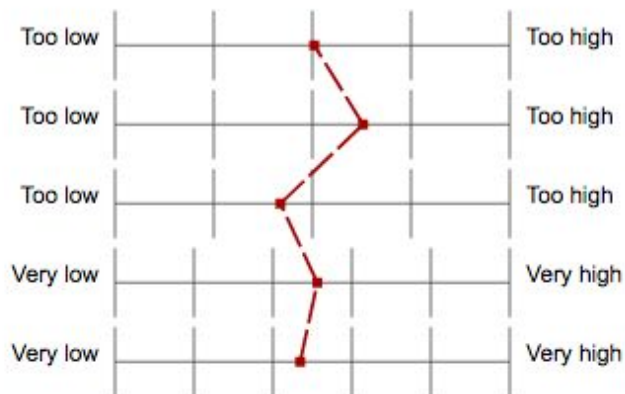
How do you rate the level of difficulty of this course?

How do you rate your workload of this course?

How do you rate the student participation of this course?

How do you rate your own acquisition of skills of this course?

How do you rate your value for your overall studies of this course?



n=101 av.=3.0 md=3.0 dev.=0.7

n=103 av.=3.5 md=3.0 dev.=0.8

n=102 av.=2.7 md=3.0 dev.=0.8

n=103 av.=3.6 md=4.0 dev.=1.2

n=104 av.=3.3 md=3.0 dev.=1.4

Additional Feedback (--)

- **Lab sessions - too short, not useful**
- Context for lecture topics - how this information will be useful in the future
- Lecture style (boring, monotonous tone of voice, talks too fast!)
- Space too crowded, room too small
- Move assignments earlier in semester
- More structured assignment feedback
- Provide paper references
- Upload slides earlier!

Additional Feedback (++)

- ++ Topics and themes
- ++ Lecture style
- ++ Guest lecture (Google talk)
- ++ Offers a different perspective on technology
- ++ Don Norman readings
- ++ Hands-on work/research
- ++ Students treated fairly

EXAM PREPARATION AND TIPS

Exam Format

- 90 minutes
- 12 multiple choice questions
 - Only one correct answer
 - Incorrect and unanswered questions marked the same (i.e., 0 points)
- 5 open-ended questions
 - Designed to take 10-15 minutes each

Exam Format

- Has been reviewed by multiple parties for clarity, content, fairness, and timing
- Exam is designed to take 90 minutes or less if you have sufficiently prepared
 - In the unlikely event that we have grossly miscalculated, rest assured that this will be reflected in your favor in the grading

A Word About Exams

- The exam is designed to be a FAIR assessment of a university-level assessment course
- An assessment, not an exercise
- Performance should be proportional to ability and preparation
- Not intended to be “easy for anyone” – not the point of the exam
- Some questions will be more challenging, some will be more straightforward – this is intentional

Points of Focus: Lecture 1

Paradigms

- Understanding of interaction as communication
- Familiarity with key historical paradigm shifts and why they are important
- Familiarity with the individual technologies and approaches that accompany paradigm shifts
- Basic familiarity with key historical figures

Points of Focus: Lecture 2

Input, Output, and Memory

- Understanding of interaction frameworks, interfaces, and components
- Familiarity with human sensing and perception systems
- Familiarity with human memory and function
- Interaction models

Points of Focus: Lecture 3

Information Visualization

- Information Visualization benefits and challenges
- Perception and visual information processing
- Familiarity with principles of visualization (i.e., what makes for good and poor visualizations)

Points of Focus: Lecture 4

Principles for Design

- Basics of design, usability, and usefulness
- Design concepts and principles (primarily from Norman), e.g., conceptual models, constraints, mappings, signifiers, affordances, etc.

Focus Points: Lecture 5

Modeling Interaction and Cognition

- Familiarity with various interaction models and their differences and purposes
- Basic application of models

Focus Points: Lecture 6

Guest Lecture from Dan Greenblatt

- UX Design approach
- Double diamond model

Focus Points: Lecture 7

CSCW

- Differences between computing for individuals vs. groups
- Focuses and priorities of CSCW
- Groupware – classes of technologies and approaches
- Basic frameworks and how to apply them
- CSCW stakeholder groups
- Barriers to CSCW adoption

Points of Focus: Lecture 8, 9

Ubicomp and Domestic Technologies

- The vision of ubicomp
- Ubicomp technology approaches
- Basic familiarity with models and methods for ubicomp
- Domestic technologies general areas of applications
- Domestic technology challenges and barriers

Points of Focus: Lecture 10

Gender and Computing

- Basic understanding of universal design
- Basic understanding of the concept of gender computing/gender HCI
- Knowledge of potential benefits of consideration of gender in software design and engineering
- Understanding of fundamental differences between male and female interaction with computers
- Basic knowledge of studies of gender difference in computing use
- Understanding of how and why to apply the GenderMag walkthrough approach

Points of Focus: Lecture 11

Health and Wellness

- Basic concept of pervasive healthcare
- Areas of pervasive healthcare application
- Technology approaches to pervasive healthcare
- Challenges for pervasive healthcare technologies

Points of Focus: Lecture 12

Sustainable HCI

- Understanding of basic environmental impacts of ubicomp
- Understanding of the concepts of sustainability in design and sustainability through design
- Approaches to sustainability in design and through design

Points of Focus: Lecture 13

Computer Ethics

- Basic understanding of historical development of computer ethics
- Understanding of key challenge areas for computer ethics
- Familiarity with purpose of computer ethics codes of conduct
- Understanding of the need and purpose of study ethics for human participant studies
- Understanding of informed consent
- Understanding of vulnerable populations

General Tips

- All class content is fair game
- Material emphasized in class and exercises is higher priority than other content (e.g., things only mentioned in the readings)
- Understanding of concepts and how they apply is higher priority than memorization of facts
- You will not be asked to list sets of guidelines, describe specific examples of technologies (e.g. Estrellita or UbiFit Garden) (EXCEPTION: Key technologies in the Paradigms lecture) but you should understand the underlying concepts, know approaches, classes of technologies, and be able to apply ideas practically

General Tips

- You should also be able to draw simple relationships between content in various lectures, e.g., how ubicomp relates to pervasive healthcare or sustainable HCI, how Norman's concept of constraints might apply to a domestic technology
- Avoid being TOO wildly creative (i.e., to the point that we don't know how to grade your answers)

Final Notes

Thanks for being a great class!

If you're interested in further opportunities (theses, independent studies, TA/Tutor jobs, additional courses) please get in touch

Best of success with your exams
and

Happy Holidays!