

ACM Code of Ethics and Professional Conduct

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Lesson 1

ACM

Association for Computing Machinery

- The ACM is the world's largest professional society for computing
- <https://www.acm.org/>
- What does ACM do?
 - Publishes journals, magazines, conference proceedings, books
 - Organizes conferences
 - 37 Special Interest Groups (SIGs) on many topics of computing (e.g., SIGAI, SIGEVO, SIGCSE)
 - A ton of member services:
 - Career development resources, free access to e-books and (non-credit) online courses (e.g., certification prep).

ACM: Extremely Brief History

- Founded in September 1947 at Columbia University as the "Eastern Association for Computing Machinery"
- January 1948: dropped the word "Eastern" from its name
- September 1949: the membership adopted a constitution
- 1947 purpose:
 - "The purpose of this organization would be to advance the science, development, construction, and application of the new machinery for computing, reasoning, and other handling of information."
- Today's version:
 - "The Association is an international scientific and educational organization dedicated to advancing the art, science, engineering, and application of information technology, serving both professional and public interests by fostering the open interchange of information and by promoting the highest professional and ethical standards."

Lesson 2

CODES OF ETHICS

Codes of Ethics

- Professional societies often have codes of ethics for members of the profession.
 - The American Medical Association (AMA): <https://www.ama-assn.org/topics/ama-code-medical-ethics>
 - The American Bar Association (ABA): https://www.americanbar.org/groups/professional_responsibility/publications/model_rules_of_professional_conduct/
 - The American Institute of Aeronautics and Astronautics: <https://www.aiaa.org/about/Governance/Code-of-Ethics>
 - National Society of Professional Engineers: <https://www.nspe.org/resources/ethics/code-ethics>

ACM Code of Ethics and Professional Conduct

- The current version is from 2018.
- Full version history:
 - 1966: Guidelines for Professional Conduct in Information Processing
 - 1972: ACM Code of Professional Conduct
 - 1992: ACM Code of Ethics and Professional Conduct
 - 2018: ACM Code of Ethics and Professional Conduct

Why does computing need a code of ethics?

- Many of the same reasons as other professions.
- Developing computer systems leads to unique issues
- Computer technology has potential for good and bad
 - Potential for Good:
 - making routine tasks quick and easy, communicating with others, saving lives, entertaining etc
 - Potential for Bad:
 - loss of privacy, identity theft, other forms of electronic theft, breakdown of critical systems we rely on, fraud, harassment / predatory behavior

Special Responsibilities

- Software developers and other computing professionals have significant opportunities to:
 - Do good or cause harm
 - Enable others to do good or cause harm
 - Influence others to do good or cause harm
- Software at the heart of many safety-critical systems
 - Medical systems, aircraft, air traffic control systems, weapons systems, automobiles, mass transportation, etc
- Software at the heart of most everyday activities, with increasing network connectivity

Lesson 3

OVERVIEW OF THE ACM CODE OF ETHICS AND PROFESSIONAL CONDUCT

The ACM Code of Ethics and Professional Conduct

- Preamble: Summarizes its purpose, audience, and intended use
- General Ethical Principles:
 - Outlines 7 fundamental ethical principles for the basis of the code
 - Each principle is statement of responsibility
 - Each principle supplemented by guidelines to help understand and apply the principle
- Professional Responsibilities:
 - 9 additional considerations of professional responsibility
- Professional Leadership Principles
 - 7 principles for guiding individuals in leadership roles
- Compliance with the Code
 - 2 principles involving compliance with the code

Who does the Code apply to?

- “The Code is designed to inspire and guide the ethical conduct of all computing professionals, including”
 - Current and aspiring practitioners
 - Instructors
 - Students
 - Influencers
 - Anyone who uses computing technology in an impactful way

The Public Good

- Emphasis on the public good throughout the document
 - “Computing professionals’ actions change the world. To act responsibly, they should reflect upon the wider impacts of their work, consistently supporting the public good.”
 - “... the public good is always the primary consideration.”

Purpose of the Code

- Concerned with how ethical principles apply to a computing professional’s conduct
- Basis for ethical decision-making
 - Multiple principles should usually be considered
 - Different principles will have different relevance to issue
 - Thoughtful consideration of fundamental ethical principles (section 1)
 - Public good is always top-most consideration

Lesson 4

SECTION 1. GENERAL ETHICAL PRINCIPLES

1.1 Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing

- Obligation to use skills to benefit society
- Minimize negative consequence of computing
 - Threats to health, safety, security, privacy
- Should consider whether results respect diversity
- Encouraged to contribute to society via volunteer work benefiting public good
- Promote environmental sustainability

1.1 Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing

- Encouraged to contribute to society via volunteer work benefiting public good
- Variety of ways to do this:
 - Volunteer for a non-profit or charitable organization
 - Contribute some time to an open-source project
 - Humanitarian Open Source: <http://www.hfoss.org/>

1.2 Avoid Harm

- Harm = Negative consequences, especially if significant or unjust
 - Unjustified physical or mental injury
 - Unjustified destruction or disclosure of information
 - Unjustified damage to property, reputation, environment
- Unintended harm: obliged to undo or mitigate harm
- Avoiding harm:
 - Consider potential impact on all affected by decision
 - Follow best practices (e.g., test, validation, etc)
- If harm is intentional part of system: ensure harm is ethically justified
- Report signs of system risks that might result in harm

1.3 and 1.4

- 1.3 Be honest and trustworthy
 - Transparent and full disclosure of all system capabilities, limitations, and potential problems
 - Honest about qualifications and ability to complete a task
 - Open about real or perceived conflicts of interest
- 1.4 Be fair and take action not to discriminate
 - Technology may cause new, or enhance existing, inequities
 - Technology should be as inclusive and accessible as possible

1.5

- 1.5 Respect the work required to produce new ideas, inventions, creative works, and computing artifacts
 - Credit the creators of ideas, inventions, work, artifacts
 - Respect copyrights, patents, trade secrets, license agreements, etc
 - Contributing time to projects that help society illustrate positive aspect of this principle

1.6, and 1.7

- 1.6 Respect privacy
 - Technology enables collecting, monitoring, exchanging personal info quickly
 - Precautions to prevent reidentifying anonymous data, ensuring accuracy of data, protecting data from unauthorized access or disclosure
- 1.7 Honor confidentiality
 - Protect confidentiality (trade secrets, client data, research data, patent apps, etc) except for violations of law, regulations, or the Code.
- Privacy and Confidentiality are not the same thing
 - Respecting privacy concerns **personal** data
 - Honoring confidentiality concerns things like intellectual property, such as of your employer or clients, etc.
 - Read the guidelines in the ACM Code, especially for these two principles (most commonly mixed up by students on quizzes, etc)

Lesson 5

SECTION 2. PROFESSIONAL RESPONSIBILITIES

2.1, 2.2, and 2.3

- 2.1 Strive to achieve high quality in both the processes and products of professional work
 - Insist on and support high quality work from self and colleagues
 - Respect the right to transparent communications about a project
- 2.2 Maintain high standards of professional competence, conduct, and ethical practice
 - Technical knowledge, communication skills, etc
 - Upgrading skills an ongoing process
- 2.3 Know and respect existing rules pertaining to professional work
 - Rules: laws and regulations, and policies/procedures of your organization
 - Challenge unethical rules through appropriate channels before violating

2.4, 2.5, and 2.6

- 2.4 Accept and provide appropriate professional review
 - High quality work depends on professional review at all stages
 - Seek and utilize peer and stakeholder review
 - Provide constructive, critical reviews or others' work
- 2.5 Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks
 - Provide objective evaluations to employers, employees, clients, users, and the public
 - Extra care to identify and mitigate potential risks in machine learning systems
 - Report issues that may result in major risk to appropriate stakeholders
- 2.6 Perform work only in areas of competence
 - Disclose lack of necessary expertise

2.7 and 2.8

- 2.7 Foster public awareness and understanding of computing, related technologies, and their consequences
 - Share technical knowledge with the public and encourage understanding of computing
 - Respectfully address inaccurate or misleading information related to computing
- 2.8 Access computing and communication resources only when authorized or when compelled by the public good
 - Access systems, software, data only if believed authorized or of public good
 - A publicly accessible system doesn't imply authorization
 - Can use unauthorized access to disrupt function of malicious systems (but avoid harm)

2.9 Design and implement systems that are robustly and usably secure

- Robust security a primary consideration when designing and implementing systems
 - Take action to secure resources from accidental and intentional misuse, modification, and denial of service
 - Integrate monitoring, patching, and vulnerability reporting
- Systems should be usably secure
 - Security features should be intuitive and as easy to use as possible
 - Discourage security precautions that are confusing, or that inhibit legitimate use

Lesson 6

SECTION 3. PROFESSIONAL LEADERSHIP PRINCIPLES

3. Professional Leadership Principles

- Leadership in the context of the Code can be:
 - Formal: manager, supervisor, department head, etc
 - Informal: via influence over others
- The Code's definition of leader:
 - Any member of an organization or group who has influence, educational responsibilities, or managerial responsibilities.

3.1, 3.2, and 3.3

- 3.1 Ensure that the public good is the central concern during all professional computing work
 - People should always be the central concern in computing
- 3.2 Articulate, encourage acceptance of, and evaluate fulfillment of social responsibilities by members of the organization or group
 - Leaders should encourage full participation of computing professionals in meeting relevant social responsibilities
- 3.3 Manage personnel and resources to enhance the quality of working life
 - Leaders should consider personal and professional development, accessibility requirements, physical safety, psychological well-being, and human dignity of all workers

3.4, 3.5, and 3.6

- 3.4 Articulate, apply, and support policies and processes that reflect the principles of the Code
 - Organizational policies should be consistent with the Code and communicated to all relevant stakeholders
 - Reward compliance with policies, and take action on violations
- 3.5 Create opportunities for members of the organization or group to grow as professionals
 - Educational opportunities (classes, workshops, etc) are essential
- 3.6 Use care when modifying or retiring systems
 - Take care when modifying or discontinuing support for features
 - Graceful migration from legacy systems

3.7

- 3.7 Recognize and take special care of systems that become integrated into the infrastructure of society
 - Even simple systems potentially impact society, such as everyday activities
 - Commerce, travel, education, government, and healthcare

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Lesson 7

SECTION 4. COMPLIANCE WITH THE CODE

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4. Compliance with the Code

- 4.1 Uphold, promote, and respect the principles of the Code
 - Adhere to the principles
 - Take actions to resolve ethical issues they recognize, including expressing concern to the person(s) thought to be violating the Code
- 4.2 Treat violations of the Code as inconsistent with membership in the ACM
 - Encourage and support adherence regardless of ACM membership
 - Consider reporting violations to the ACM
 - ACM may take action per their Enforcement Policy

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