**Lecture Overview**

- ACM Software engineering code of ethics
- Analysis of the code
- Case studies
- A Few Other Codes

**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

**Eight Principles Identify 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
1.08 “Volunteer professional skills to good causes”

**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

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

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

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
# Be Fair to and Supportive of Colleagues

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

<table>
<thead>
<tr>
<th>8.01</th>
<th>Stay current with developments in field</th>
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<tbody>
<tr>
<td>8.02</td>
<td>Improve ability to create high quality software</td>
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<tr>
<td>8.03</td>
<td>Improve ability to produce high quality documentation</td>
</tr>
<tr>
<td>8.04</td>
<td>Improve understanding of software and documentation used in work</td>
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<tr>
<td>8.05</td>
<td>Improve knowledge of relevant standards</td>
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<tr>
<td>8.06</td>
<td>Improve knowledge of this Code and its application</td>
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<tr>
<td>8.07</td>
<td>Do not treat others unfairly because of prejudices</td>
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<td>8.08</td>
<td>Do not influence others to break the Code</td>
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<tr>
<td>8.09</td>
<td>“Recognize that personal violations of this Code are inconsistent with being a professional software engineer”</td>
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# 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

# Origin of Virtue Ethics

- Aristotle
  - Happiness results from living a life of virtue
  - Intellectual virtue: developed through education
  - Moral virtue: developed by repeating appropriate acts
  - Deriving pleasure from a virtuous act is a sign that the virtue has been acquired
- Some virtues: Benevolence, courage, fairness, generosity, honesty, loyalty, patience, tolerance
- A person of strong moral character
  - possesses many virtues
  - knows right thing to do in each situation

# Strengths of Virtue Ethics

- Provides a motivation for good behavior
- Provides a solution to the problem of impartiality
  - Some virtues are partial (e.g., generosity)
  - Other virtues must be impartial (e.g., honesty)

# Virtue Ethics Complements Other Theories

- Virtue ethics may not work as a stand-alone theory
- It may be a good complement to utilitarianism
- Allows rationale for action to be considered
- Solves problem of moral luck that plagued act utilitarianism
**Alternative, Discipline-Independent List of Fundamental Principles**

- Be impartial.
- Disclose information that others ought to know.
- Respect the rights of others.
- Treat others justly.
- Take responsibility for 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.

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**Case: Software Recommendation**

- Sam Shaw asks for free advice on LAN security
- Prof. Smith answers questions and recommends top-ranked package
- Prof. Smith does not disclose
  - She has financial interest in company producing top-ranked package
  - Another package was given a “best buy” rating
- Who are the stakeholders?
- Did Prof. Smith do anything wrong?

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**Analysis**

- Most relevant principles
  - Be impartial.
  - Disclose information others ought to know.
  - Share your knowledge, expertise, and values.
- Clause 1.06: Prof. Smith was deceptive
- Clauses 1.08, 6.02: Prof. Smith freely gave valuable information
- Clauses 4.05, 6.05: Prof. Smith did not reveal conflict of interest

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**Conclusion**

- Professor Smith should have revealed her conflict of interest to Mr. Shaw.

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**Case: Child Pornography**

- Joe Green a system administrator
- Asked to install new software package on Dennis’s computer
- Green not authorized to read other people’s emails or personal files
- Green sees suspicious-looking file names
- He opens some of Dennis’s files and discovers child pornography
- What should he do?
- Who are the stakeholders?

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**Analysis (1/2)**

- Most relevant principles
  - Be impartial
  - Respect the rights of others
  - Treat others justly
  - Maintain your integrity
Analysis (2/2)

* Most relevant clauses
  – 2.03: Somebody has misused the company PC
  – 2.09: Someone is using the PC for a purpose not in the employer’s interest
  – 3.13: Joe violated the policy against opening files
  – 5.10: Someone else may have planted the files on Dennis’s computer

Conclusions

* Joe was wrong to violate company policy to uncover child pornography
* **Once he has this knowledge, however, he is obliged to share it with company authorities**
* Joe should be discreet

Case: Anti-Worm

* Internet plagued by new worm that exploits hole in popular operating system
* Tim creates anti-worm that exploits same security hole
* Tim’s anti-worm fixes PCs it infects. It also uses these PCs as launch pad to reach new PCs.
* Tim launches anti-worm, taking pains to keep it from being traced back to him.
* The anti-worm quickly spreads through Internet, infecting millions of computers
* System administrators around the world combat the anti-worm

Analysis (1/2)

* Who are the stakeholders?
* Most relevant principles
  – Continually improve your abilities.
  – Share your knowledge, expertise, and values.
  – Respect the rights of others.
  – Take responsibility for your actions and inactions.

Analysis (2/2)

* Most relevant clauses:
  – 1.01: Tim did not accept responsibility for his action.
  – 1.08: The worm was free, but cost system administrators a lot of time.
  – 2.03: The anti-worm entered computers without permission of their owners.
  – 8.01, 8.02, 8.06: Tim improved his knowledge and skills by creating the anti-worm.

Conclusions

* Tim’s welfare is less important than the public good
* By attempting to hide his identity, Tim refused to accept responsibility for his actions
* Tim violated the property rights of the PC owners whose systems were infected by his anti-worm
* Tim violated the Code
Case: Consulting Opportunity

• Jean works in support organization for Acme Corporation
• Many Acme customers downgrading their level of support
• East Dakota gives Jean opportunity to run a training class similar to that provided by Acme
• Jean tells no one at Acme
• Jean develops materials at home on own time
• Jean takes paid vacation to teach class
• Who are the stakeholders?

Analysis (1/2)

• Most relevant principles
  – Be impartial.
  – Take responsibility for your actions and inactions.
  – Disclose information that others ought to know.
  – Maintain your integrity.
  – Continually improve your abilities.

Analysis (2/2)

• Most relevant clauses
  – 3.04: Jean was well qualified to develop materials and teach class
  – 8.04: By creating materials, Jean became even more familiar with Acme’s package and its capabilities
  – 4.05: Jean didn’t disclose his conflict of interest with his employer
  – 2.08: Jean deprived himself of “time off” needed to do his best work at Acme
  – 6.05: Jean put his own interest above that of his employer

Conclusions

• Jean did not disclose East Dakota’s offer or his decision to Acme’s management
• Acme’s management is likely to question Jean’s loyalty to the company
• Jean’s actions were wrong and unwise

Linux Code of Conflict

As a reviewer of code, please strive to keep things civil and focused on the technical issues involved. We are all humans, and frustrations can be high on both sides of the process. Try to keep in mind the immortal words of Bill and Ted, “Be excellent to each other.”

Code of Conflict

Contributor Covenant

“This week people in our community confronted me about my lifetime of not understanding emotions. My flippant attacks in emails have been both unprofessional and uncalled for. Especially at times when I made it personal. In my quest for a better patch, this made sense to me. I know now this was not OK and I am truly sorry.” -- Linus

Contributor Covenant
Microsoft

Letter from Satya Nadella


Is it consistent with our core values and the Standards?
We expect you to think through the issues and to use available resources to help including our core values and the Standards.

Is it Legal?
We are not expecting you to be a lawyer or legal expert. We do expect you to ask questions and seek guidance if you are not sure.

Am I comfortable with others finding out about my decision?
If you would not be comfortable with friends, family, and co-workers, it probably is not the right thing to do.

If you cannot answer yes, or are not sure, do not make the decision or take the action until you get additional help and guidance.

Not on Board

“Sometimes, it looks like we’re replacing in-your-face incivility with knife-in-the-back incivility.”

“We’ve known that it’s being used politically, instead of encouraging meritocracy. I don’t understand why these people don’t come down on this like a ton of bricks. It’s toxic culture, and it will poison the projects that adopt it. Contributors will leave, politicians will remain. Until you can stick a fork in it.”

“If feelings get in the way of results this amounts to self-sabotage by the community as a whole. I’m a slightly abrasive person, and I do my best to make sure I’m polite, but sometimes things get in the way. I get a little crusty, but that’s because I have personal problems that make it harder to be nice all the time. My inability to be a perfect person 100% of the time shouldn’t put me in jeopardy of not being able to participate in the community. Targeted harassment? Ban it, obviously. Some hurt feelings because of something being given the bent of “toxic masculinity” when it doesn’t exist? GTFO.”

“All of this is so unbelievably worrying. How can they not see what they are doing? Meritocracy is the very foundation OSS is built upon. I would understand adopting a mild and very basic CoC in order to encourage positive and productive collaboration. But such an ideological piece from this unbelievably toxic author... Linus, what the fuck are you doing?! You’re letting everyone down!”

Coddling of the American Mind?

“Something strange is happening at America’s colleges and universities. A movement is arising, undirected and driven largely by students, to scrub campuses clean of words, ideas, and subjects that might cause discomfort or give offense.”


Codes of Conduct: Questions

● Are codes of conduct even effective or practical? Are they really necessary?
● Is it fair to require people to refrain from actions or speech which they consider non-offensive but others might find offensive?
● Do we have a right to not be offended? Should we be protected from offensive speech or actions?