

# Ethics

- Today: Ethical concepts, theory, and strategy
- Source: Tavani, *Ethics and Technology*, 4/e, 2013
- Wednesday: Professional ethics applied to computing and engineering. Ethics quiz and ethics essay assignment.
- Friday: no class
- Monday: Ethics essay discussion

# Why do we need to study ethics in computing and engineering?

- Discuss important ethical issues before they occur
- Ethical issues can be complex and deal with conflicting principles
- Acquire skills in dealing with complex ethical problems and know the tools available to help solve them
- Protect the public
- Protect ourselves
- Maintain a high quality of work
- Keep us honest

# Definitions

- Etiquette
  - The codes of behavior and courtesy. Rules indicating the proper and polite way to behave.
- Laws
  - The system of rules established by an authority such as the government of a town, state, or country.
- Morals
  - The accepted standards of right and wrong that are usually applied to personal behavior.

# Definitions

- Ethics
  - A branch of philosophy that involves systematizing, defending, and recommending concepts of right and wrong behavior
  - The principles of conduct governing an individual or a group

# Definitions

- Engineering Ethics
  - The field of applied ethics and system of moral principles that apply to the practice of engineering. The field examines and sets the obligations by engineers to society, to their clients, and to the profession.
- Computing Ethics (or Cyberethics)
  - The field of applied ethics and system of moral principles that apply to the practice of computing. This covers both personal use of computing and professional behavior of developers.

# Moral Systems

- Gert describes a moral system as
  - Public – The rules are known to all of the members.
  - Informal – The rules are not formalized like laws in a legal system. There is no "referee" to determine if a rule has been violated.
  - Rational – The system is based on principles of logical reason accessible to all its members.
  - Impartial – The system is not partial to any one group or individual. I.e., the rules are applied "blindfolded".

# Moral Systems

- Rules of conduct are derived from a society's core values, but are justified based on how they are grounded. Three approaches:
  - In a religious system: Stealing is wrong because it offends God or violates one of the Commandants
  - In a legal system: Stealing is wrong because it violates the law.
  - In a philosophical system of ethics: Stealing is wrong because it is wrong.

# Ethical Theories

- Consequence-based ethical theories (Bentham, Mill)
  - Correct action is the one that produces the most desirable outcome. Maximize "happiness".
  - Act Utilitarianism – an act is morally permissible if the consequence results in the greatest good for the greatest number of persons affected by the act.
  - Rule Utilitarianism – an act is morally permissible if the consequences of following a general rule would bring about the greatest good for the greatest number.



# Ethical Theories

- Duty-based ethical theories
  - Grounded in the concept of duty, or obligations that humans have to one another. Individuals are ends in themselves and have equal moral worth.
  - Rule Deontology (Kant) – act always on that principle or rule that can be universally binding, without exception, for all human beings.
  - Act Deontology (Ross) – when two or more duties conflict weigh the evidence at hand to determine which course of action would be required in a particular circumstance.

# Ethical Theories

Emphasis on consequences

Emphasis on individual actions

Act Utilitarianism	Rule Utilitarianism
Act Deontology	Rule Deontology

Emphasis on rules

Emphasis on duty or obligation

# Ethical Theories

- **Contract-based ethical theories**
  - (Hobbes) Natural state is full of threats to individuals. Surrender some freedoms for rules and laws that protect individuals from being harmed by other members.
- **Character-based ethical theories**
  - "Virtue" ethics. Become a moral person by developing good habits and character traits through proper training.

# Critical Reasoning

- Critical reasoning is a branch of informal logic
- Use logical ***argument*** to resolve ethical disputes
- Structure of logical argument contains at least two ***claims***, statements or assertions that are analyzed for truthfulness or falsity

# Logical Argument

PREMISE 1

PREMISE 2 (optional)

PREMISE 3 (optional)

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CONCLUSION

- Both the premises and the conclusion are claims.
- Generally, this is read “Premise 1 (and Premise 2 and Premise 3) is true, therefore the Conclusion is true”.

# Critical Reasoning

- Argument reasoning can be ***valid*** (strong) or ***invalid*** (weak)
- For a valid argument, if all of the premises are assumed to be true, then it is impossible for the conclusion to be false. Otherwise the argument is invalid.
- To show an argument is invalid, need to show just one ***counterexample***. I.e., a scenario where all the premises are true, but can still result in a false conclusion.

# Critical Reasoning

- Note: a counterexample does not mean that the conclusion is false, just that the argument does not support it.
- A valid argument is not enough to determine a conclusion is true.
- An argument is ***sound*** if
  - The argument is valid
  - All of the premises are shown to be true in the actual world.

# Critical Reasoning

- Invalid arguments can be *inductive* or *fallacious*.
- Inductive arguments provide a high degree of probability for the truth of their conclusions based on true premises. E.g.  
75% of people who own iPods also own iMacs.  
Dr. Hwang owns an iPod.

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Dr. Hwang owns an iMac.
- Fallacious arguments are ones where although all premise statements may be true, the conclusion does not likely follow from the premises.



# Strategy for Evaluating Arguments

1. Convert the argument into standard form.  
(List premises, followed by conclusion)
2. Is the argument valid? If so, to go step 3. If not, go to step 4.
3. Is the argument sound? Go to step 5.
4. Is the (invalid) argument inductive or fallacious? If inductive, determine if all premises are true in the actual world.

# Strategy for Evaluating Arguments

5. Make an overall assessment of the argument.
  - a. sound
  - b. valid, but unsound
  - c. inductive with all true premises
  - d. inductive with some false premises
  - e. fallacious with a mixture of true and false premises
  
- Note: an inductive argument with all true premises may be stronger overall than a valid, but unsound, argument.

# Strategy for Approaching Ethics Issues

1. Identify a practice that is controversial from a moral perspective
  - a. Determine any hidden or opaque features
  - b. Assess any descriptive components of the ethical issue via the implications it has for relevant institutions and groups
  - c. In analyzing the elements of the issue, determine whether there are any specific guidelines that can help resolve the issue

# Strategy for Approaching Ethics Issues

2. Analyze the ethical issue by clarifying concepts and situating it in a context
3. Deliberate on the ethical issue. The deliberation process requires two stages
  - a. Apply one or more ethical theories to the analysis of the moral issue
  - b. Justify the position you reached by evaluating it via the agreed upon standards and criteria using a logically sound argument