Simulation & Models

- Recall our discussion of models:
  - a model is intended to address a certain class of questions or issues
  - models make simplifying assumptions
- Recall the omission of aerodynamic stability from bridge models before the Tacoma Narrows Bridge disaster
- Nevertheless, computer models & simulations are essential

Evaluating Models

- How well is the underlying science understood?
- What sorts of simplifying assumptions are made?
- How well does the model agree with experimental results?

Computer Crime

- Often just a new or “better” way to commit traditional crimes
- Ampliative aspects of computer technology
  - may allow committing crimes on a larger scale
- Reductive aspects of computer technology
  - may make it harder to detect crimes, identify criminals, etc.

Some Kinds of Computer Crime

- Fraud, embezzlement & theft
- Stealing (data)
- “Hacking” (system cracking)
  - individual systems
  - the information infrastructure
  - benign hacking?
- Viruses & worms: reproduce selves
  - virus: hides in another program
  - worm: an independent program

Constitutional & Civil Liberties Issues

- 1st Amendment protects freedom of speech & press
- 4th Amendment protects against unreasonable search & seizure
- Do they apply to electronic & other new media?
- So far, the courts generally have held them to apply, but there is much uncertainty
Communication Media

• Is the operator of a communication medium responsible for the information it carries?
  – analogy: telephone companies & post office
  – analogy: a privately-owned meeting room
• Can the operator restrict this information?
  – analogy: telephone companies & post office
  – analogy: private presses

Encryption & Wiretapping

• Encryption can be used to ensure privacy & authenticity
  – may be used for legal/illegal purposes
• May be subject to export restrictions
• What provisions should be made for government interception & recording of communications?
• What limits should be imposed on the government

How do we address these issues?

• Engineering issues (efficiency, economy, elegance)
  – addressed by engineering analysis & other kinds of technical expertise
• Legal issues
  – addressed by lawyers, courts, etc.
• Ethical issues
  – addressed by ethicists & ethical analysis

These questions are especially relevant to issues such as the “USA PATRIOT” Act

New Ethical Issues

• Consider a relatively well-defined ethical problem:
• Is it ethical to “hack” into someone else’s computer system (and do no damage)?
• Traditional moral codes do not address this issue!
• So we must apply ethical analysis

Ethical Analysis

• Only touching on a few basic ideas
• Ethics = “the study of how to decide if something is morally right or wrong”
• What criteria are used for judging the rightness or wrongness of an action?
• There are several well-established approaches to defining criteria
Consequentialism

- If the consequences of an act are on the whole good, then the act is good
- If the consequences of an act are on the whole bad, then the act is bad
- Good or bad for whom?
- Utilitarian criterion: the greatest total happiness
- Also, may be difficult to predict consequences

Deontological Criterion

- Deontology = the study of moral obligation
- Rather than focusing on the consequences of an act, deontological arguments focus on the inherent nature of the act
- Two important questions:
  - What is the intent of the act?
  - Is it a defensible, responsible act?

Two Important Tools of Ethical Analysis

- Dialectic
- Analogy

Dialectical Method

- Root meaning of dialectic is conversation
- Philosophical dialectic: a method of approaching the truth by moving critically among two or more viewpoints
- The strengths & weaknesses of each viewpoint are revealed, especially from the perspective of the others
- Ideal outcome: a synthesis that combines the strengths & eliminate the weaknesses
- More commonly, leads to better understanding of improved viewpoints

Analogical Method

1. Identify analogous situations that are more familiar or better understood
2. Identify similarities & differences between the analogy and the issue of concern
3. Consider their relevance to the issue
4. Explore competing analogies dialectically

A Method of Ethical Analysis

1. Identify stakeholders
2. Identify what is at stake (utilitarian step)
3. Identify duties & responsibilities (deontological step)
4. Think of analogies
5. Make a decision or repeat the steps
Three Case Studies

• Sharing music files
• Zimmerman & PGP encryption
• “Hacking” computer systems

Reminder:
Final Exam
Monday, May 3
2:45 – 4:45

Next Time:
a movie on the history of computing
&
a short quiz
(to ensure you pay attention!)