

ECEN 478: Senior Design

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Dr. Mahmoud Nabil Mahmoud
mnmahmoud@ncat.edu

North Carolina A & T State University

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Outline

- 1 Introduction
- 2 Ethical Systems
- 3 IEEE Code of Ethics
- 4 Intellectual Property Issues
 - Patent
 - Copyright
 - Tradeseecret
- 5 Liability

Motivation

- You will face ethical dilemmas in your career – count on it!
- Your decisions will affect:
 - your professional reputation.
 - your employability.
 - the welfare of others.
- Companies are placing more value on ethics (or at least saying they are – just ask Enron, Worldcom, and Adelphia!).

Learning Outcomes

By the end of this chapter, you should:

- Understand what is meant by morals, principles, ethics, and values.
- Be familiar with the IEEE Code of Ethics.
- Understand what a patent is, the criteria for filing one, and the elements that constitute it.
- Understand differences between patents, copyrights, trademarks, and trade secrets.
- Understand the concepts of negligence and liability as they apply to product design.
- Understand how to incorporate ethical issues throughout the design process.
- Be able to analyze ethical case studies and suggest solutions to the dilemmas that they embody.

Ethical Theory in a Nutshell

Ethics (Defination 1)

Branch of philosophy that deals with the general nature of good and bad and the specific moral obligations of and **choices** to be made by the individual in her/his relationship to others.

- General defination to everyday life

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Ethics (Defination 2)

Rules or standards governing conduct, especially those of a profession.

- We specially look at IEEE & ACM guidlines

Morals vs Principles vs Values

Morals

Awareness of what is right and what is wrong.

Principles

Fundamental rules that govern the human behaviour (societal or personal)

eg.

- People should be honest and trustworthy in their dealings with others

Values

Things that a group of people hold as being valuable or worthwhile

eg.

- Value of the hardwork

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Rule-Based Ethics

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Apply a set of rules to make all decisions

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- **Transitivity:** you would accept others applying the same decision to you.

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What are problems with this?

It is difficult to define a universal set of rules that everyone can agree upon.

Conditional Rule-Based Ethics

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- Speeding is illegal except in extreme medical cases.

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What are problems with this?

Lead to abuses or excuses

Utilitarian Ethics

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What are problems with this?

Who determine the highest good?

- Leader
- Committee
- Majority
- Etc

Ethics Exercise

Question: Is it ethical to accept a job offer with a company, then change your mind and decline the offer if you subsequently receive a better offer from another company? YES or NO.

How do you avoid being put in this situation?

- Hold off on a decision until you have received all the offers
- Ask for extra time to make decision

Ethics Exercise

Question: Is it ethical to go on a job interview with a company that you have no intention working for? YES or NO.

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IEEE Code of Ethics

Copyrighted material – see Chapter 11 in the book.

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 - They own all the intellectual property that you create while on the payroll.
 - You may also have to sign a **no-compete** clause indicating that you will not work for a direct competitor for a given period of time after leaving the company.

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- Filing for a patent is free.
- You must reduce the idea to practice in order to receive a patent.
- If you unwittingly infringe upon someone else's patent, you are not liable.

Types of Patents

Utility patent

Granted to anyone who invents or discovers any new and use process, machine, article of manufacture, compositionary of matter, or any new useful improvment thereof.

Design patent

Design patent may be granted to anyone who invents a new, original, and ornamental design or an article manufacture.

Utility Patent

To get a utility patent, the idea must be:

- Novel
- Non-obvious
- Useful

Who determines this?

- United States Patents Trademark Office (USPTO)
- Patent Examiner

Elements of the patent

- Citation of prior art.
- Description of the invention.
- Claims – legal description of the invention and its uniqueness

www.uspto.gov

Other types of Patents offer by USPTO

- Plant Patent – For new plant forms
- Provisional patent application: Allow you to apply for a patent in advance of reduction to practice (one-year period)

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Copyright

- Copyrights - protect published works such as books, articles, software, etc.
- Copyright means that other **cannot distribute** copyrighted material without permission of the owner.
- Copyrights are good for the lifetime of the holders plus 50 years.
- Can be registered at US. Copyright Office.
- Process is very easy

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Trade secret

- The idea must be kept secret so that others cannot find out about it.
- This is often done by restricting the number of people who have access to the idea and by having those who do know about it sign a **nondisclosure agreement**.

Question: Is it legal to reverse-engineer another company's product to reveal their trade secrets?

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Question: Is it legal to reverse-engineer another company's product to reveal their trade secrets?

How does the Digital Millennium Act affect this?

- Breaking encryption to learn the trade secret is prohibited

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Liability

Liability

Something that ones owes to someone (e.g., an obligation or dept)

May result from:

Tort

A tort is a wrongful act, though not necessary illegal, for which a civil lawsuit can be brought including product liability.

Negligence

Not following resonable rules and standards that apply which leads to a wrongful act (i.e., tort)

Negligence

An act is defined a legally negligent if the following 4 hold true.

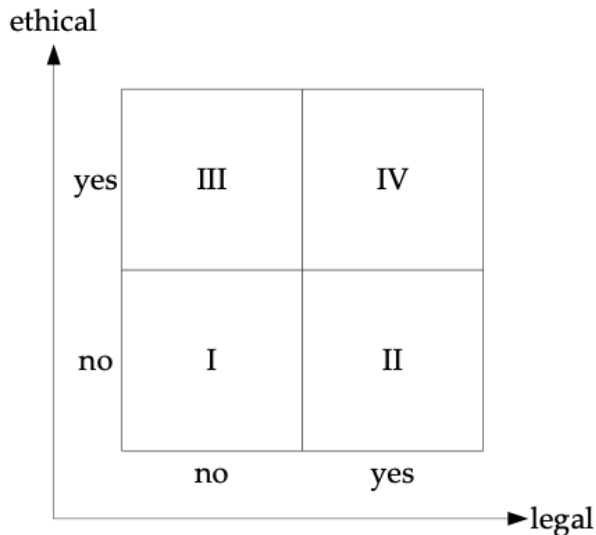
- 1 The manufacturer had a duty to follow reasonable standards and rules.
- 2 There was a breach of that duty
- 3 The plaintiff was harmed.
- 4 The breach caused the harm.

Strict Liability

An even less stringent standard, known as **strict liability**, has been adopted. The person/company suing you does not have to prove negligence. You are liable if the following four things hold true

- 1 The product was dangerous and/or defective.
- 2 The defect existed when it left the manufacturers control.
- 3 The defect caused harm.
- 4 The harm is assignable to the defect

Handling Ethical Dilemmas



Whistleblower

What is a **whistleblower**?

A person who go outside of the company to the press or a government agency to report the wrong-doing

e.g.,

- Shuttle Challenger accident, in which the explosion was caused by O-ring failures in the booster rockets made by Morton-Thiokol.
- Engineers and scientists recommended against the launch
- Known after the accident

Whistleblower Guidelines

When it is appropriate to become a whistleblower?

- The harm to the public must be considerable or serious.
- Concerns must have been made to your supervisors (up to the CEO) without satisfactory resolution.
- You have documented evidence that would convince an impartial observer that your company is wrong.
- Release of the information outside of the company will prevent the harm.

Case Study Analysis

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Apply to Example 11.1 in text and end-of-chapter problems.

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- 2 Identify the stakeholders.
- 3 Consider the ethical values are relevant to the situation.
- 4 Determine the best course of action

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- Have you conducted adequate research to understand prior art? Are you infringing on patents or copyrights?

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- Are your cost & project schedules fair & realistic?

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- Did you consider ways the product can be misused?
- Did you conduct design reviews?
- Have you reversed engineered another's product?
- Are your cost & project schedules fair & realistic?
- Did the design pass acceptance tests (verification)?

Summary

- Be prepared to encounter ethical dilemmas in your career.
- Important to understand basics of intellectual property – who owns it?
- Employ good design process activities to include ethical considerations in design.
- Apply ethical decision-making paradigm and utilize resources available to you

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Questions 

