ETHICAL AND MORAL CONSIDERATIONS

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OUTLINE

- Why study ethics?
- Code of ethics
- Basic ethics questions
- Ethical conflict
- Consequences of unethical practices
- Ethical case studies

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WHY STUDY ETHICS?

- Accreditation agencies (ABET) deem it a critical part of all engineering curricula, including EE and CmpE
- Virtually all professional societies have a code of ethics:
- IEEE Code of Ethics: http://www.ieee.org/about/corporate/governance/p7-8.html
- ACM Code of Ethics: http://www.acm.org/about/code-of-ethics

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CODE OF ETHICS

- Highlights from the IEEE Code of Ethics:
  - “To accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment”
  - “To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist”
  - “To be honest and realistic in stating claims or estimates based on available data”
  - “To avoid injuring others, their property, reputation, or employment by false or malicious action”

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SOME BASIC ETHICS QUESTIONS

- What forms the basis of our views and our understanding of ethics?
- Why is ethical behavior important to society? What could happen if the issue of ethics was completely disregarded?
- How can ethical practices best be learned, promoted, and ensured?

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ETHICAL CONFLICT

- Duty/Responsibility vs. Malice/Indifference
  - Example: FTDI counterfeit IC driver issue
- Duty vs. Self-Interest (“Conflict of Interest”)
  - Examples: Bribery, misuse of position, etc.
- Duty vs. Duty
  - Maximize profit for employer vs. obligation to society
  - Confidentiality vs. whistle-blowing (Edward Snowden)

CONSEQUENCES

- Some consequences of unethical practices:
  - Injury or loss of human life
  - Loss of business contracts or customers
  - Damage to a business's image or reputation
  - Fines and penalties
  - Jail time
- What other consequences can you think of?

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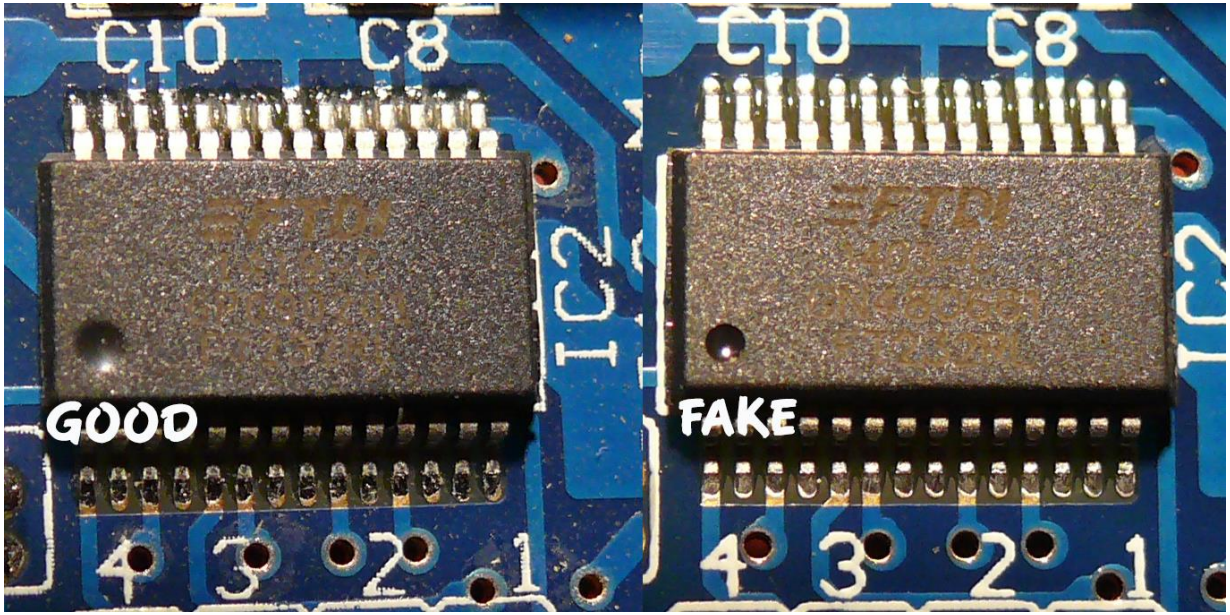
ETHICS CASE STUDIES

FTDI Counterfeit ICs Driver Scandal

The Setup: Future Technology Devices Incorporated (FTDI) is a leading manufacturer of USB to serial converter ICs popular among hobbyists. This popularity has lead to cloning and knockoffs, particularly in emerging markets. Both original and counterfeit ICs rely upon a driver produced by FTDI in order to function properly.



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ETHICS CASE STUDIES

FTDI Counterfeit ICs Driver Scandal

What Happened: FTDI released an updated driver for their USB-to-Serial devices on their website (9/29/2014). The updated driver would identify software-compatible FTDI clones and brick them by rewriting the USB Product ID to “0000”. The new driver was automatically added to Windows Update, whereupon it was automatically mass-installed to many, many devices.

Aftermath: The driver was quickly pulled from Windows Update and an emergency patch was committed the following week to work with bricked devices. The CEO was forced to issue a public apology. Substantial damage was done to the reputation of FTDI

ETHICS CASE STUDIES

FTDI Counterfeit ICs Driver Scandal

Ethical Questions to Ponder:

- Did FTDI's actions constitute unethical behavior? If so, at what point, and why?
- As a customer who has purchased a gadget containing an FTDI chip, how did you know if the chip was legitimate or not?
- What sorts of devices could use a USB interface featuring an FTDI chip? What sorts of damage could be done if the devices became inoperable?

ETHICS CASE STUDIES

The Ford Pinto

The Setup:

- Early 1970s, gas prices are rising in the United States
- American customers are interested in smaller, more efficient cars (specialty of Japanese car manufacturers)
- Ford created a small car, the Pinto, to compete
- Due to the rushed design process, errors were made and the fuel tank was designed poorly. Ford was aware of this issue from internal studies and had a patent on a safer fuel tank design.
- US regulations only required frontend crash testing at speeds less than 20MPH at the time

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ETHICS CASE STUDIES

The Ford Pinto

The Setup, continued:

- The cost of modifying a Pinto in 1970 was determined to be $11 (~$150 today)
- In order to determine whether or not the redesign was necessary, Ford performed an economic analysis. The following economic assumptions were used:

  Cost of a human life: $200,000 (~$1.2 million today)
  Cost of a severe burn injury: $67,000 (~$415,000 today)
  Cost to replace destroyed vehicle: $700 ($4,327 today)
  Estimated deaths: 180
  Estimated burn injuries: 180
  Estimated vehicles destroyed: 2100

  Estimated vehicles sold: 11 million
  Estimated light trucks sold: 1.5 million

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ETHICS CASE STUDIES

The Ford Pinto

What Happened:

- The results of the economic analysis can be seen below:

Category	Cost/incident	# Incidents	Cost
Burn Deaths	$200,000	180	$36M
Burn Injuries	$67,000	180	$12M
Burned Vehicles	$700	2100	$1.5M
Total:			**$48.5M**

Category	Cost/unit	# Units	Cost
Cars	$11	11M	$121M
Light Trucks	$11	1.5M	$16.5M
Total			**$137.5M**

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ETHICS CASE STUDIES

The Ford Pinto

What Happened:

- Ford Pinto was delivered to market
- Some cars were burned, some burn injuries occurred, and some deaths resulted from the previously mentioned problems
- Ford became engaged in a high-profile court case

Incriminating Evidence:
"We'll never go to a jury again. Not in a fire case. Juries are too sentimental. They see those charred remains and forget the evidence. No sir, we'll settle." Ford Employee

- Ford was forced to recall the Pinto for a significant cost

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ETHICS CASE STUDIES

Ethical Questions

- Did Ford's actions constitute unethical behavior? If so, at what point, and why?
- What is the monetary value of a human life?
- If you had the option to pay $150 to make your car 1% safer, would you do so? Why or why not?