L11: Ethical and legal issues

Motivation

Definitions

Intellectual property

Patents

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Liability

Motivation

Job hunting scenario

- You're conducting a job search on your senior year
- You've interviewed with several companies
- Company A offers you a job, you accept the position and sign a contract agreeing to a starting salary, position and start date
- Two weeks later, Company B offers you a job with a higher starting salary and a more interesting position

- Do you turn down the offer from Company B?
- Do you accept their offer, and inform A you're not working for them?

Definitions

Ethics

- The study of moral obligations
- If there is no decision to be made, there is no ethical dilemma

Morality

- Concerned with principles of right and wrong and the decisions that derive from these principles
  - Often taught by stories shared by all cultures, e.g. boy cry wolf

Principles

- Fundamental laws that govern behavior
  - e.g., the Golden Rule shared by all major religions

Values

- Whatever a person or group believes to be worthwhile
  - e.g., valuing hard work (good value)
  - e.g., valuing theft, unless it is from your own group (bad value)

Rule-based ethics

- In the strictest sense, rules can be considered to be absolute: either you follow the rule (good) or break it (bad)
- This type of ethical system is based on two principles
  - Universality: when the rules can be accepted by everyone
  - Transitivity: you would accept others applying the rules to you
- The challenge is to find a set of rules that everyone agrees on

Conditional rule-based ethics

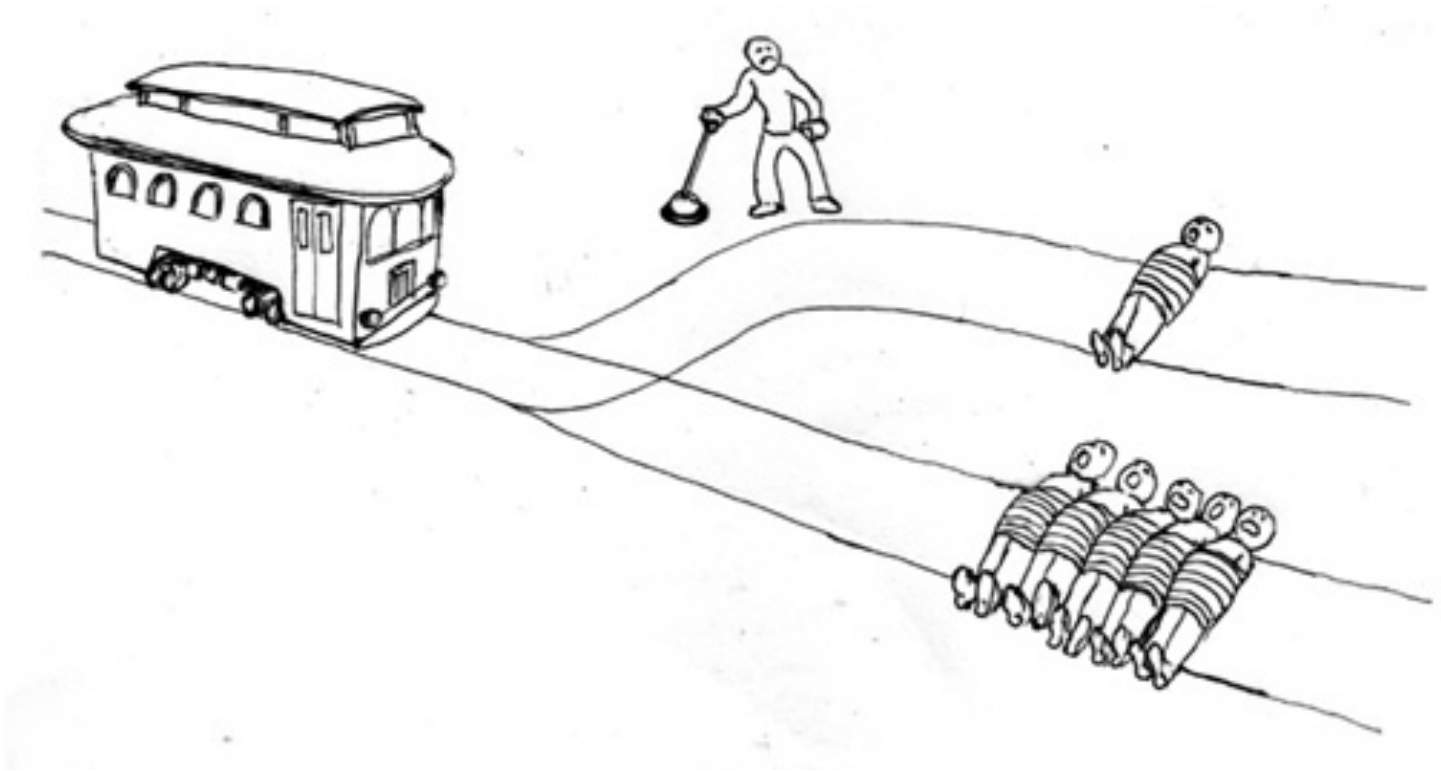
- When there are certain conditions under which a rule can be broken
  - Breaking the speed limit while driving an injured person to a hospital?
  - Cheating in an exam b/c you had to work extra hours to pay medical bills?

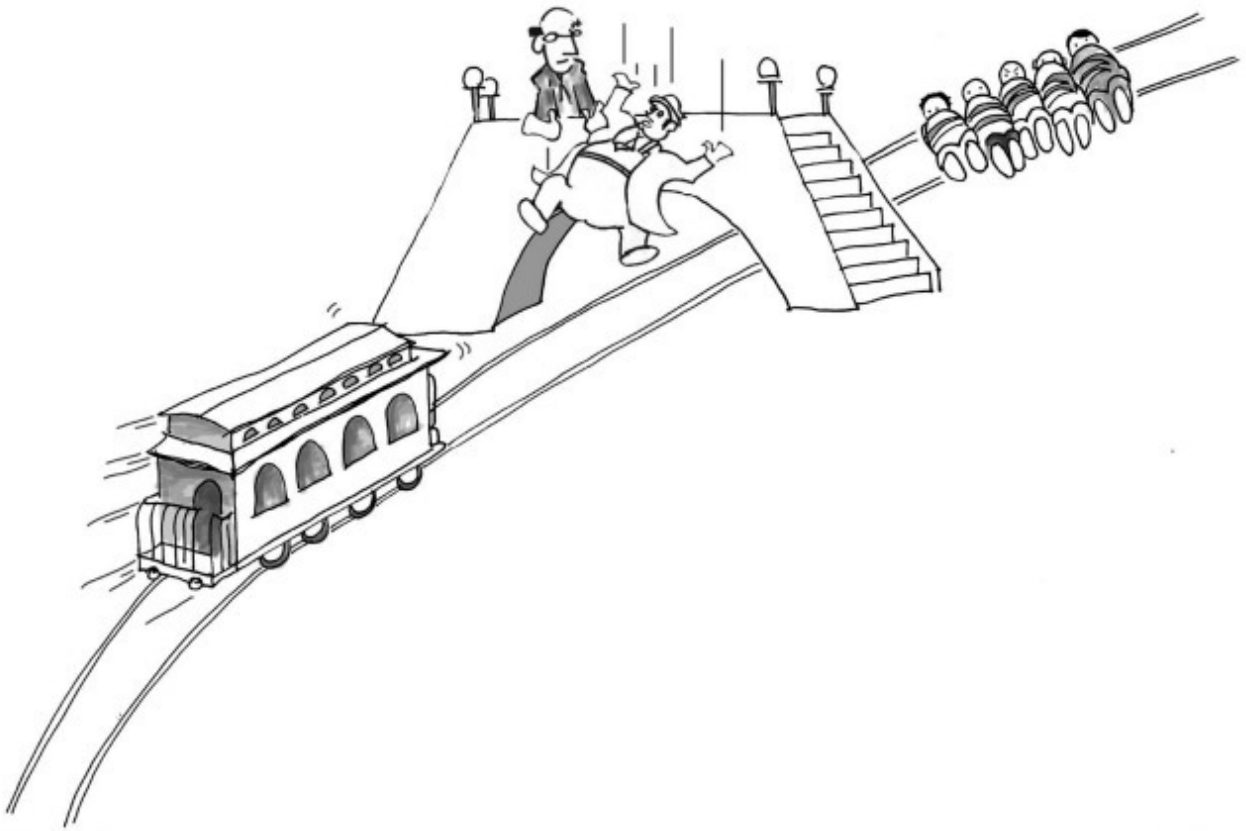
Utilitarian ethics

- Decisions are made to bring about the highest good for all
- Challenges
  - How do you determine what the highest good is?
  - What to do if the decisions are really bad for certain parties?

Situational ethics

- Decisions are made to produce the highest good for the individual in the situation at hand
- Generally considered a poor ethical decision-making approach





Job hunting scenario

- You're conducting a job search on your senior year
- You've interviewed with several companies
- Company A offers you a job, you accept the position and sign a contract agreeing to a starting salary, position and start date
- You inform all other companies you're no longer available
- Two weeks later, Company A tells you they are rescinding their offer and are giving you a $1,000 compensation
- Later you find out they offered your job to another student in your class who had a higher GPA and more work experience

- Was the company's decision ethical?
- How about your decision a few slides ago?

Intellectual property

Deals with the question of "who owns it"

- On your first day of work at a new company you may be asked to sign a contract so that they own all of the IP you create while on payroll
- You may also have to sign a non-compete clause preventing you from working for a direct competitor for a given period of time after leaving the company

Three ways of protecting IP

- Patents
- Trade secrets
- Copyrights

Patents

- The most well-know method to protect IP
- Utility vs. design patents
  - Utility: focuses on a useful process, machine, etc.
  - Design: focuses on ornamental aspects of a design
- A utility patent must meet three conditions
  1) It must be novel, meaning that nothing like it already exists
  2) It must be non-obvious, meaning that another person would not be expected to develop it based on existing technology
  3) It must be useful, meaning that it must perform a useful function and can be reduced to practice (i.e., you must be able to implement it)
- The elements of a patent are
  1) A citation of prior art: a list of similar patent or publicly available tech
  2) A description of the invention: how it operates and how it would be reduced to practice
  3) Claims: the legal description and the unique aspects of the invention

- In the US, patents are granted based on the concept of first to conceive, not first to file
  - Good records are therefore needed to prove this
  - Typically requires bound design notebook
- Once granted, a patent is valid for 20 years
  - After that period, it is fair game for anyone to use it
- Patents have drawbacks
  - The owner must be vigilant to defend it and initiate legal action
  - Once patented, the idea is made public for all to see

Trade secrets

- Rather than patent the idea, keep it secret!
  - Restrict the number of people who have access to the idea, and
  - Have those who know sign a non-disclosure agreement
- Drawback
  - If somehow the trade secret is made public, it is fair game for everyone to use it
- Reverse engineering
  - The process of taking apart a device to understand how it works
  - Digital Millennium Copyright Act (2000)
    - Criminalizes the act of circumventing measures that control access to copyrighted works (digital rights management)

Copyright

- Protects published works such as books, articles, music and software
- Others cannot distributed the materials without permission
- It is relatively easy to copyright
  - Just indicate the word “copyright” on the work, and include the year of publication and the name of the copyright holder
  - You can also register it through the US Copyright Office
- Good for the lifetime of the owner plus 50 years (75 years if company)

Copyleft

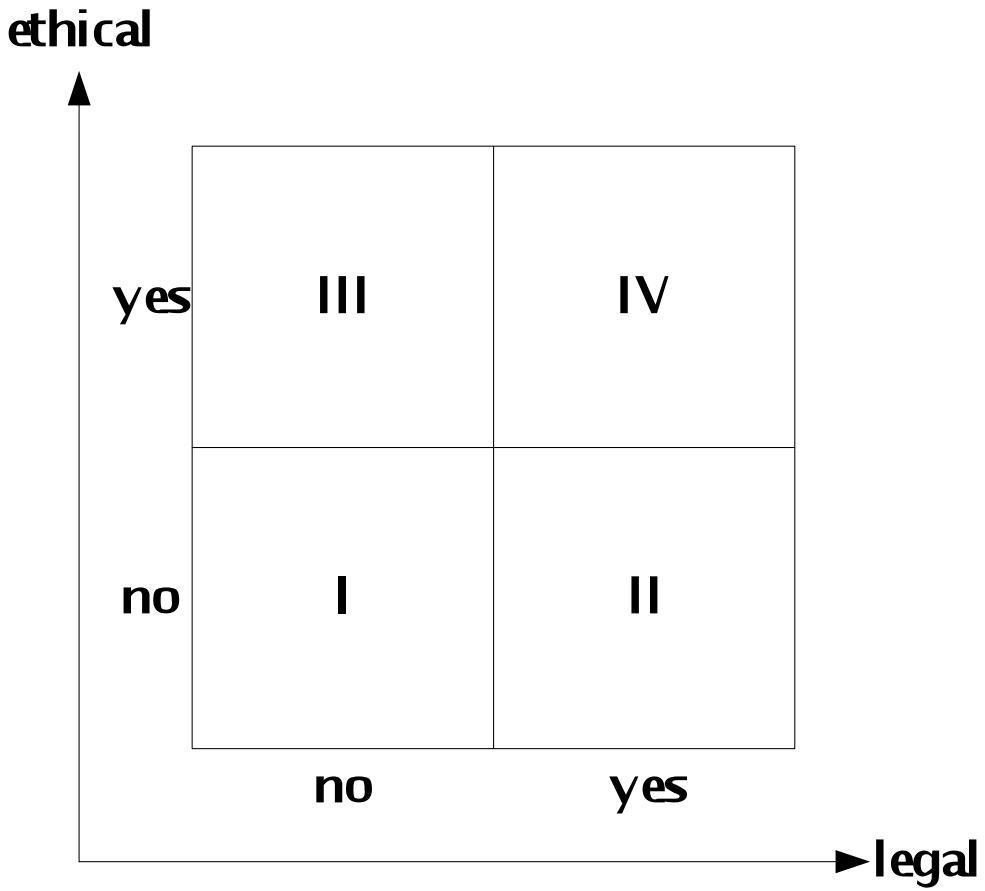
- A general method for making software free, and requiring all modified and extended versions of the program to be free as well

Liability and negligence

Liability

- A company or person can be sued for damages caused by a product design and be held liable for them (i.e., required to pay money)
  - There are two liability standards: negligence, and strict liability
- Negligence claims can be brought for design flaws, manufacturing defects and for failing to warn the user of safety hazards
  - An act is defined a legally negligent if the following 4 hold true:
    - The manufacturer had a duty to follow reasonable standards and rules
    - There was a breach of duty (i.e. failed to include safety devices)
    - The plaintiff was harmed
    - The breach caused the harm
- Strict liability focuses on the product itself: if the product contains a defect that caused harm, the manufacturer is liable
  - This is a less stringent standard: the person/company suing you does not have to prove negligence; you are liable if the following four things hold true:
    - The product was dangerous and/or defective
    - The defect existed when it left the manufacturer's control
    - Defect caused harm
    - The harm is assignable to the defect

Handling ethical dilemmas



Use the **newspaper test** to evaluate decisions: would you be comfortable if the decision were published in a newspaper for all to see?

Whistleblowers

- There may be situations in which you are put in an ethical dilemma by your employer that cannot be resolved internally
- In such cases you may go outside the company to report the problem
- The following four criteria must be met:
  - The harm to the public must be considerable or serious
  - Concerns must have been made to your superiors (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

Incorporating ethics in the design process

- Have you conducted adequate research to understand prior art? Are you infringing on patents or copyrights?
- Do your requirements specifications meet the needs of the stakeholders?
- Did you make the design space as large as possible?
- Did you identify and apply relevant safety standards?
- Did you consider all possible ways a design can fail?
- 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)?