How We Regulate

- Lessig discusses four factors that serve to regulate behavior in human societies
How We Regulate

- Law
- Architecture
- Market
- Norms
Computer Ethics

- Why Computer Ethics?
- What is different about computers?
- What are the possible impacts of actions?
Computer Ethics

- How are computers a unique technology
- logical malleability
- ubiquitous, embedded
- informational enrichment
- systems with global reach
Global Information Space

• We have created an information space that is global in its reach but local in control.

• What are the types of information that can be found in this information space?

• What are the types of actions that can be taken in this information space?

• What are the general classes of actors?
Information Types

- Personal
- health
- criminal
- shopping
- pictures
- friends
Information Types

• Academic/Scientific
  • research papers
  • course materials
  • encyclopedias
Information Types

- Industrial/Commercial
  - machine and process designs
  - advertisements, products
  - offers
Information Types

• Entertainment/Media
  • magazines
  • books
  • songs
  • movies
Information Types

- Governmental/Political
  - news
  - history
- commentary, opinion
Information Types

- Control
  - commands to control host computers
  - commands to control network routers
  - commands to control attached devices
Information Space

• Actions

• adding/deleting/distributing information

• accessing information

• browsing, downloading, streaming

• monitoring actions of others

• denying access, filtering, blocking
Information Space

• Actors
  • individuals
  • interest groups
  • corporations
  • governments, institutions
  • governments
Information Space

- Ethical Questions

- Who should be able to do which actions to what information?

- Specifying this general question gives rise to the classes of ethical issues in the information age.
Information Ethics

- Intellectual Property --- academic/commercial/entertainment
- Privacy --- personal
- Freedom of Speech/Access --- history/political/cultural
- Hacking/Security --- control
Intellectual Property

- What is intellectual property?
- Benefits of intellectual property protection
- Limits to intellectual property protection

- What is property?
Property

- something that is owned
- ownership of something gives the right to consume, alter, share, redefine, rent, mortgage, pawn, sell, exchange, transfer, give away or destroy it, or to exclude others from doing these things
Property Rights

- Locke (1689): *The Second Treatise of Government*

- People have a right…
  - to property in their own person
  - to benefits from their own labor
  - to things which they remove from Nature through their labor
Property Rights

- As long as...
  - no person claims more property than he or she can use
  - after someone removes something from the commons, there is plenty left over
Property Rights

- Property rights... to control, use, and dispose of physical property as one wants
- Private property has helped produce a general, and powerful prosperity.
- A system for ordering economic relations that benefits all (many) members of society.
Property Rights

- Property rights are not absolute.

- There is no property that does not have to yield at some point to the interests of the state.

- Your land may be taken to build a highway, your driveway crossed by the postman, your house inspected by health inspectors.

- A limited right that balances exclusive control by the individual with certain common needs.
Property Rights

• Information as property
• Rights to control of information
• Intellectual Property (IP)?? What is it?
Intellectual Property

• Intellectual property: any unique product of the human intellect that has commercial value

• Books, songs, movies

• Paintings, drawings, product designs

• Inventions, manufacturing processes, chemical formulas, computer programs

• Intellectual property ≠ physical manifestation
Intellectual Property

• A popular dress
• steal a physical dress from someone
• steal intellectual property of a dress
• how?
Expanding Property Right to Intellectual Property

- Extracting from nature and adding value by labor
- How is writing a play akin to making a belt buckle?

- Belt buckle
  - Mine ore, Smelt it down, Cast it into shape
Expanding the Right to Intellectual Property

• Writing a play
  • “Mine” words from English language
  • “Smelt” them into sentences, prose
  • “Cast” them into a complete play

• How is intellectual property different from physical property?
Analogy Is Imperfect

- If two people design the same dress, both cannot own the design — intellectual property is one-of-a-kind

- If one person copies another’s dress, both have the design — copying an item of intellectual property is different from stealing a physical object
Intellectual Property

• Should we recognize intellectual property rights?

• Utilitarian Analysis
  • stakeholders
  • benefits
  • costs
Benefits of Intellectual Property Protection

- Some creative people are altruistic; some are not
- Money can be an incentive for speculative work
- Authors of U.S. Constitution recognized benefits to *limited* intellectual property protection
- “to promote progress of Science and useful Arts”
Costs of Intellectual Property Protection

- Loss of free use or access
- Impediment to derivative developments
- Stifle evolution/combination of ideas
Limits to Intellectual Property Right

- Giving creators rights to their inventions stimulates creativity
- Society benefits most when inventions are in public domain (free access and use)
- So, a balance is sought in regulation
How to Regulate Information Age IP

• Law
• Architecture … computers and code
• Market … cheaper, faster to copy
• Norms … stealing?
Legal Protections for Intellectual Property

- Trade secrets
- Trademarks
- Patents
- Copyrights
Trade Secret

• Confidential piece of intellectual property that gives a company a competitive advantage.
• Never expires
• Independent reverse engineering allowed
• May be compromised when employees leave
• Restrictions on future work
Trademark, Service Mark

- Trademark: Identifies source of goods
- Company can establish a “brand name”, logo
- Does not expire
- If brand name becomes common noun, trademark may be lost (xeroxing, googling)
- What is a cyberspace trademark?
Cybersquatting

- Domain name as a trademark
- Copying or using a valuable domain name
- Has been found in most cases to be intellectual property... Anti-Cybersquatting Piracy Act (ACPA)
- Typosquatting is prevalent
Patent

- A public document that provides a detailed description of an invention and how to create it.
- Provides owner with exclusive right to the invention
- Owner controls the making, using, or selling of the invention for 20 years
- Owner can transfer rights to others for production
Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvements thereof, may obtain a patent, subject to the conditions and requirements of this title.

For an invention to be patentable it must:

1. be a statutory machine
2. be new, novel
3. be useful
4. be non-obvious
Patent Statutory

• A “statutory machine" is an apparatus that performs some function. Inventions that are machines are also referred to as apparatus, devices or systems. Examples of machines now include a general-purpose computer programmed to perform a certain operation.

• An algorithm is mathematics.. not patentable.. software must be phrased as a machine created by following computational steps to do a certain task on a certain type of computer to be patentable.
Software Patent

- Prior to 1980’s, software deemed not eligible
- The 1981 case of Diamond v. Diehr
  - first instance in which the U.S. Supreme Court ordered a patent on an invention even though computer software was utilized. In that case, the invention related to a method for determining how rubber should be "cured." The invention utilized a computer to calculate and control the heating times for the rubber.
Software Patent

- In 1990's, broader software patents were allowed
- *State Street Bank* case
  - decided business processes implemented as software in a computer were patentable
Software Patent

- phrase algorithm as process in a computer system
- “machine or transformation” eligibility test
- can information be transformed, perhaps
- patent office overwhelmed with number and diversity of applications
- must be more than new, must be non-obvious
Software Patents

• Too many awarded. obvious, though seemed novel
  • Amazon.. one-click shopping
  • text processing
    • fat line for highlighting
    • text color for depth of nesting
  • page up, page down button on text display
Software Patents

- 2000’s Supreme Court begins to clamp down
- Ending most do-it-on-a-computer patents for simple business practices and other actions on a computer
Software Patents

- Thousands filed each year (Microsoft, Apple, Samsung….)
- Thousands of lawsuits filed each year
- Patents bought and sold.. patent trolls…
Copyright

• How different?

• What can be copywritten?
Copyright

• What
  • independently created/requiring creativity
  • involve human authorship
  • fixed in a tangible medium
  • short story .. idea for a story/movie
  • examples?
Copyright

- Works of Creative Art/Authorship
  - literary, academic works
  - music
  - movies/videos
  - software ... object code (source is trade secret)

- Copyright-related industries represent over 5% of U.S. gross domestic product
Copyright

• Provides owner of an original work five rights
  • control over
    • Reproduction, Distribution
    • Public display, Public performance
    • Production of derivative works
Copyright Creep

• The original length of copyright in the United States was 14 years, and it had to be explicitly applied for.

• Berne Convention 1886 .. copyright automatic for 50 years after author's death
Copyright Creep

- kinds of material covered and terms of protection have consistently expanded

- CTEA (1998) Disney push to continue protections for classic movie characters, Sonny Bono extension ... life + 70 years 95 years for work for hire and early works

- Adelphi Charter (2004) .. guidelines, notes threat to creativity of copyright expansions
Copyright

• Where is the balance?
  • terms keep getting longer
  • more items covered

• Fair Use
Fair Use

- Limit on rights granted to authors
- *Sony v. Universal City Studios*
- Digital Technology and Fair Use
Fair Use Concept

- Sometimes legal to reproduce a copyrighted work without permission or payment
- Courts consider four factors in analyses
  - Purpose and character of use.. commercial
  - Nature of work.. creative/fiction
  - Amount of work being copied.. all
  - Affect on market for original work.. yes
Fair Use Examples

- quotation of excerpts of a book in a review;
- quotation of short passages in a scholarly or technical work;
- use in a parody of some of the content of the work;
- reproduction by a library of a portion of a work to replace part of a damaged copy;
- reproduction by a teacher or student of a small part of a work;
- incidental and fortuitous reproduction, in a newsreel
A popular group creates a hit song that includes a 4-bar percussion sample from an earlier, famous rock-and-roll song without permission. The group overlays the track with 10 tracks of original music in creating the new hit song.

Is this fair use of the borrowed music?

consider 4 dimensions..
Fair Use

- Dimensions
  - commercial .... non-commercial
  - creative .... non-creative
  - entire work .... small piece of work
  - destroys market .... little or no market impact
Technology and Fair Use

- As electronic and digital technology evolve, new varieties of fair use circumstances arise
Sony vs. Universal City Studios

• Sony introduces Betamax VCR (1975)
• People start “time shifting” TV shows
• Movie studios sue Sony for copyright infringements
• U.S. Supreme Court rules (5-4) that time shifting is fair use
Fair Use

- Analog technology
  - Vinyl record to cassette degraded quality
  - Music publishers focused on big-time “bootleggers”
- Digital technology
  - CD to CD results in perfect copy
  - CD to MP3 results in a very good, compact copy
  - Internet + high-speed connections → sharing
RIAA v. Diamond Multimedia Systems

• Diamond introduces Rio media player (1998)
• People start “space shifting” their music to their MP3 players
• RIAA takes legal action against Diamond for violation of the Audio Home Recording Act
• U.S. Court of Appeals, 9th Circuit, affirms that “space shifting” is consistent with copyright law
Cases and Legislation

- Davey Jones’ Locker
  - subscription software bulletin board
  - not legal, as was for commercial (re)use
- David LaMacchia and No Electronic Theft Act (1997)
  - free software bulletin board.. not illegal
- Napster, KaZaA, free music sharing networks
• The other factor that could effectively regulate is the architecture of digital systems
DRM and Fair Use

- Digital Rights Management (DRM)
- Digital Millennium Copyright Act (DMCA)
- Secure Digital Music Initiative
Digital Rights Management

- Actions that owners of intellectual property take digitally (code) to protect their rights

- Initial Approaches
  - Encrypt digital content
  - Digital watermarking so devices can recognize content as copy-protected
SONY/BMG

- created CDs with Extended Copy Protection
- secretly installed a rootkit on PCs that would not allow ripping of CDs to MP3s
- was discovered and company had to provide patch to remove and pay customers having it on their computers
Encrypting DVDs

- Contents of DVDs encrypted using Content Scramble System (CSS)
- Jon Johansen wrote a decryption program for Linux
- *2600 Magazine* published the code
- Movie studios sued *2600 Magazine* and won
- Johansen was tried in Norway and found not guilty
Secure Digital Music Initiative

• Goals
  • Create copy-protected CDs
  • Secure digital music downloads
  • Consortium of 200 companies developed “digital watermarking” scheme
• Failed
  • successful “Hack SDMI” challenge
• Internet copying became huge before SDMI ready
Digital Rights Management

- code.. architecture .. to protect copyright interests on Internet connected devices
- simulate copyright in physical world
- Trusted Systems
Arguments for DRM

- Stefik... Trusted Systems
- could be made to mimic fair use
- could provide automated information services
Criticisms of Digital Rights Management

- Any technological “fix” is bound to fail
- DRM can undermine fair use
- DRM could reduce competition
- Some schemes make anonymous access impossible
DMCA (1998)

- First big revision of copyright law since 1976
- Brought U.S. into compliance with WIPO
- Extends copyright protection to music broadcast/distributed over Internet
- Makes it illegal for anyone to circumvent copy controls (code), even for fair use purposes
• World Intellectual Property Organization
• international agreements on IP policy
• http://www.wipo.int/portal/en/index.html