Intellectual Property

Lecture 4-2

Computers & Society (CPSC 430)

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Intellectual Property Protection

• So, why Intellectual Property Protection?
  – Some people are altruistic; some are not
  – Allure of wealth can be an incentive for speculative work
  – Thus, benefits to intellectual property protection

• But, these rights should come with limits
  – Giving creators rights to their inventions stimulates creativity
  – Society benefits most when inventions in public domain
  – Strike a compromise by giving authors and inventors rights for a limited time

• It might make more sense to call it “intellectual monopoly” rather than “intellectual property”
1. Trade Secret

- Confidential piece of intellectual property that gives company a competitive advantage
- Never expires
- No legal protection
- Reverse engineering allowed
- May be compromised when employees leave firm
2. Trademark, Service Mark

- Trademark: Identifies goods
- Service mark: Identifies services
- Company can establish “brand name”
- Does not expire
- If brand name becomes common noun, trademark may be lost
- Companies advertise to protect their trademarks
- Companies also protect trademarks by contacting those who misuse them
3. Patent

• A public document that provides detailed description of invention
• A government office decides whether the invention is novel, non-obvious
• Provides owner with exclusive right to the invention
• Owner can prevent others from making, using, or selling invention for 20 years
Software Patents

• Patent protection began in 1981
• Inventions can be patented, but not algorithms
• Patent Office having a hard time determining prior art
• Result: some bad patents have been issued
  – Amazon One-Click purchasing
  – Apple: squares with rounded corners

• General skepticism about value of software patents

• *Patent trolls: what are they? What do you think?*
Copyright Creep

- Since 1790, protection for books extended from 28 years to 95 years or more
  - latest extension aims to protect Disney characters from entering public domain?
- Copyright Term Extension Act of 1998 challenged as unconstitutional
- U.S. Supreme Court disagreed: CTEA doesn’t create perpetual copyrights
Digital Rights Management

- Actions owners of IP take to protect their rights

- Approaches
  - Encrypt digital content
  - Digital marking so devices can recognize content as copy-protected

  - Consortium didn’t stick together
  - Cracked by CS researchers

- Example: Sony BMG Rootkit (2005)
  - Made everyone angry; retracted

- Example: online music stores (2003—2009)
  - Started out with DRM, in part to lock people into platforms
  - Lately, moving away from it

- Example: streaming sites (this decade)
Is it ethical to break a digital lock in order to make fair use of a copyrighted work?
Some famous examples of fair use

- “Time shifting” (recording shows on VCR/DVR)
- “Space shifting” (transcoding music onto MP3 player)

- Use of image thumbnails in search results
- Google books – indexing full texts
Legitimacy of IP Protection for Software

• Software licenses typically prohibit you from making copies of software to sell or give away
  – Our focus is not on whether it’s ethical to violate such a legal agreement after having agreed to it.

• Instead, we are considering:
  – whether society *should* give IP protection to software
  – if so, how this protection ought to be limited
  – what ethical argument can be used to justify this protection.
Intellectual Property

“The government should aggressively prosecute intellectual property infringement, particularly including peer-to-peer file sharing.”

Section 101

A total of 84 voter(s) in 789 hours

- 1 vote (1%) Strongly agree
- 7 votes (8%) Agree
- 13 votes (15%) Neutral
- 37 votes (44%) Disagree
- 26 votes (31%) Strongly disagree

Section 102

A total of 11 voter(s) in 789 hours

- 1 vote (9%) Strongly agree
- 1 vote (9%) Agree
- 1 vote (9%) Neutral
- 6 votes (55%) Disagree
- 2 votes (18%) Strongly disagree
Rights-based Analysis

• “Just deserts” argument
  – Programming is hard work that only a few can do
  – Programmers should be rewarded for their labor
    ▪ Mixing my labor with something implies ownership

• Criticism of “just deserts” argument
  – Why does labor imply ownership?
    ▪ Maybe mixing my labor with something means I lose my labor
    ▪ Pour a can of tomato juice into the ocean: I don’t own the ocean
  – A society in which all labor went to common good could be just
  – Intellectual property not like physical property
    ▪ I cut logs: I own the logs
    ▪ I write a book: I get to restrict other people from copying the book

• What do you think about this argument?
Utilitarian Analysis

• Argument against copying
  – Copying software reduces software purchases…
  – Leading to fewer software producers…
  – Leading to lower production of new software…
  – Leading to fewer benefits to society

• Each of these claims can be debated
  – Not all who get free copies can afford to buy software
  – Open-source movement demonstrates many people are willing to donate their software-writing skills
  – Hardware industry wants to stimulate software industry; freemium model; many apps are supported via ads
  – Difficult to quantify how much society would be harmed if certain software packages weren’t released

• What do you think about this argument?
Open Source

• A variety of licenses. Some typical ingredients:
  – No restrictions preventing others from selling or giving away software
  – Source code included in distribution
  – No restrictions preventing others from modifying source code
  – No restrictions regarding how people can use software
  – Same rights apply to everyone receiving redistributions of the software (copyleft)

• GNU Project (Richard Stallman, 1984-)
  – Goal: Develop open-source, Unix-like operating system
  – Most components developed in late 1980s

• Linux
  – Linus Torvalds wrote Unix-like kernel in 1991
  – Combined with GNU components to make an OS
  – Putting pressure on Microsoft, Apple, and companies selling proprietary versions of Unix
Benefits and Drawbacks of Open Source

• Benefits
  – Gives everyone opportunity to improve program
  – New versions of programs appear more frequently
  – Eliminates tension between obeying law and helping others
  – Programs belong to entire community
  – Shifts focus from manufacturing to service

• Drawbacks
  – Without critical mass of developers, quality can be poor
  – Without an “owner,” incompatible versions can arise
  – Relatively weak graphical user interfaces
  – Poor mechanism for stimulating innovation (no companies will spend billions on new programs)
Creative Commons

• Under current copyright law, eligible works are copyrighted the moment they are created
• No copyright notice does not mean it’s ok to copy
• Must contact people before using work
• That slows down creative reuse
• Free Creative Commons license indicates
  – Which kinds of copying are ok
  – Which rights are being retained
• Flickr and Magnatune two well-known sites using Creative Commons licenses
Safe Software Development

• Reverse engineering okay
• Companies must protect against unconscious copying
• Solution: “clean room” software development strategy
  – Team 1 analyzes competitor’s program and writes specification
  – Team 2 uses specification to develop software
• Interestingly, same development strategies also used to ensure that open source licenses don’t “infect” commercial software