

Computers and Society

Intellectual Property (1)

Patent, Copy-Right and Media Industry

Notice: This set of slides is based on the notes by Professor Guattary of Bucknell and by the textbook author Michael Quinn

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Definition of Intellectual Property

Intellectual Property (IP) is any unique product of the human intellect that has *commercial value*.

Example include books, songs, movies, paintings, inventions, chemical formulas, and computer programs [Quinn].

In many cases it is important to distinguish the intellectual property from its physical manifestation. It is a poem or song that is the intellectual property, not the printed version of the poem or the recording of the song.

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Types of Intellectual Property

- **Trade Secrets:** Confidential information such as formulas, processes, proprietary designs, customer lists, etc. Example: The Coca Cola formula. Illegal to steal, but not illegal to gain in other ways (for example, reverse engineering).
- **Trademarks and Service Marks:** Words, pictures, or symbols used by businesses to identify their goods or services.

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Types of Intellectual Property (2)

- **Patents:** An exclusive right to use an invention granted by a government. Patent information is public unlike trade secrets, but patents (exclusive use) are protected by law.
- **Copyright:** A right to the use of written works (written includes composition of music here). It covers rights to reproduce, distribute, display, perform, and derive new works from the copyrighted work. Software can be copyrighted; we will talk about this next class.

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History of Property Rights

The philosophy of property rights in Great Britain and the US is due to John Locke. Locke argued for a natural right to property. Locke's ideas on property refer to *tangible* property (physical property; *tangible* comes from the Latin word for *touch*).

Do Locke's ideas make sense for intellectual property, which is *intangible*?

<http://plato.stanford.edu/entries/locke-political/>

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Intellectual versus Tangible Property

Intellectual and tangible property differ in two important ways:

- First, we can duplicate physical artifacts, but every intellectual artifact is unique.
- Second, copying a piece of intellectual property is different from stealing a piece of physical property. If I steal your car, you no longer have it. If I copy your play or poem or song, you still have your copy.

These differences make it difficult to argue for a *natural right* to intellectual property.

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Benefit of IP Protection

Even if there is no natural right to ownership of intellectual property, there are benefits to a society of granting such ownership to individuals.

It allows people to benefit from their intellectual developments encourages them to work hard to develop new, useful ideas.

Drawback of IP Protection

However, there is a conflicting principle (to the one on previous page):

The benefit to society is higher if all people can apply good ideas (not exclusive use).

Ideas (or other creative work such as poem, music, software) that anyone can use for free are said to be in the *public domain*.

The Intellectual Property Compromise

The solution is to balance these two conflicting principles by granting authors and inventors *exclusive rights* to their writings and discoveries for a *limited period of time*.

The key question is, what should the length of that period of time be?

Term of Patent and Copy-Right

In the US, Congress has set different lengths for different types of intellectual property.

For example, patent application filed after June 8, 1995 has a term of 20 years; while a general rule for a copy-right is author's life span plus 70 years.

http://en.wikipedia.org/wiki/Term_of_patent_in_the_United_States

<http://www.copyright.gov/help/faq/faq-duration.html>

http://en.wikipedia.org/wiki/List_of_countries'_copyright_lengths

Trademarks

A **trademark** is a word, symbol, picture, sound, or color used by a business to identify goods. A **service mark** is such a mark identifying a service.



Trademarks (2)

We won't talk much about trademarks because I don't see much direct connection between them and computers.

There are some indirect connections that come about because of globalization and the way that improved communications technology has broadened markets.

Copyrights

A copyright provides authors with certain rights to works that they have written. The US grants five principal rights to copyrighted work:

- The right to **reproduce** the work.
- The right to **distribute** the work to the public.
- The right to **display** copies of the work.
- The right to **perform** the work in public.
- The right to **produce new works derived from** the work.

Copyrights (2)

In the US the creator of the work does not need to take any action to acquire the copyright, though copyright protection is strengthened if the work is registered with the copyright office.

Copyrights have a fixed term, and when that term expires the works go into the **public domain**.

Copyrights (3)

Copyright covers a wide range of works including books, stories, magazine articles, musical compositions in notated form (sheet music), recordings of music, plays, movie scripts, movies, characters from books and movies, computer source code, computer object (executable) code.

The way in which creators' rights are handled varies from type of work to type of work.

Fair Use

There is an important exception to copyright law that allows others to use copyrighted material without the permission of the copyright holder.

This exception is called **fair use**. It allows the use of short excerpts of copyrighted works for teaching, scholarship, research, criticism, commentary, and news reporting. Parodies are included as long as they incorporate commentary.

Fair Use (2)

Fair use in the US is subject to the following tests:

- What is the purpose and character of the use?
- What is the nature of the work being copied?
- How much of the copyrighted work is being used?
- How will the use affect the market for the copyrighted work?

Copyright Creep

Copyright creep refers to the trend to increase the term of copyrights. The US Congress has extended the length of copyrights multiple times. They now last for life plus 70 years, or 120 years from creation/95 years from publications for works created by corporations.

Disney had a key role in getting this extension passed. They don't want Mickey Mouse (created 1928) in the public domain.

Audio Home Recording Act of 1992

- This law protects the right of consumers to make analog or digital recordings for personal, noncommercial use.
 - Digital recording is a bit tricky, see below.
- All digital audio recorders needed to include the Serial Copyright Management System that allowed a copy to be made of the original work, but would not allow a copy to be copied.
- A royalty must be paid on all digital audio recorders and blank recording media.

http://en.wikipedia.org/wiki/Audio_Home_Recording_Act

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Audio Home Recording Act of 1992 (2)

Computers are not considered digital audio recorders.

As a result, as computers became common this law had diminished effect.

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Digital Millennium Copyright Act of 1998

The Digital Millennium Copyright Act (DMCA) of 1998 was intended to bring the US into compliance with international copyright rules.

It also made it illegal for consumers to circumvent encryptions schemes intended to protect copyrighted material, and to distribute software to circumvent such schemes.

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Digital Millennium Copyright Act of 1998 (2)

The DMCA also extended copyright protection to music broadcast over the internet. Royalties must be paid to copyright holders for such broadcasts.

The DCMA also imposes severe penalties for online service providers that misuse copyrighted materials. For example, a university that knows students are exchanging MP3s over the campus network is subject to penalty.

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Digital Millennium Copyright Act of 1998 (3)

The DMCA is hard to enforce, though it has had some effect on people's behavior. For example, a Princeton research group led by Edward Felten cracked an encryption scheme, and was initially stopped from publishing a paper because of fear of prosecution.

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Digital Millennium Copyright Act of 1998 (4)

A Norwegian student wrote DeCSS for decrypting DVD copy protection. He was initially prosecuted in the US and Norway.

US courts decided that he had a free speech right to publish his code that was more important than any bad effects.

He was acquitted in Norway because he had a legal right to decrypt his own DVD.

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Digital Rights Management

Digital Rights Management (DRM) refers to technology for encrypting copyrighted material so it can't be copied.

While it appeared to be a good idea, it caused problems for consumers and providers (for example, the Sony rootkit).

Most online music stores have dropped DRM as a result.

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File Sharing Networks

The development of the internet made it easy to distribute copies of music and movies. Many recent copyright law developments are connected to the growth of these networks.

The networks involved are peer-to-peer: they involve individual computers connecting and sharing information on their hard drives (as opposed to client-servers networks).

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File Sharing Networks (2)

Napster (1999) was one of the first such networks. It included a centralized index that users consulted to find out which systems desired files were stored on.

The recording industry sued to stop Napster. Napster was shut down when it could not show that it could block 100% of attempted file transfers of copyrighted material.

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Industry Efforts to Stop File Sharing

File sharing continues in spite of industry efforts to stop it. These efforts have included targeting users who have shared large amounts of copyrighted material and pressuring universities to crack down on file sharing on their networks.

Industry efforts have appeared heavy-handed because of mistaken prosecutions and threats. They have been ineffective because there are not enough resources to prosecute more than a small fraction of violators.

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SOPA/PIPA

SOPA (Stop Online Piracy Act) was proposed legislation in the US House of Representatives that was aimed at stopping illegal file transfers of copyrighted material. It was supported by the recording and movie industries. PIPA was similar legislation in the Senate.

The proposed measures were too severe, however. Copyright owners could get court orders instructing foreign sites to take down material accused of being distributed illegally.

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SOPA/PIPA (2)

If the material was not removed, then copyright holders could:

- Use DNS blocking to prevent access to the site (DNS translates website names into IP addresses).
- Force search engines to remove the site from search results.
- Force payment services not to do business with the site.

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SOPA/PIPA (3)

People were concerned that the definition of “foreign” wasn’t clear enough to protect US sites. They were also concerned that sanctions could be applied even if the violations were minor (or a minor part of a site’s activity), or if mistaken accusations were made.

In addition, the penalties were severe.

SOPA/PIPA (4)

SOPA/PIPA opponents including Wikipedia organized a web blackout in January 2012 as a protest. The strong support for the blackout and the bad publicity for SOPA and PIPA caused Congress to drop both.

Creative Commons

A **commons** is a “resource to which anyone within the relevant community has a right without obtaining permission.”

Harvard Law Professor Lawrence Lessig proposed that the internet is an *innovation commons*. He proposed a *creative commons* to provide licenses to use intellectual property without charge.

Creative Commons (2)

In Lessig’s Creative Commons, it is easy to set up a licensing arrangement. Answer two questions:

- Allow commercial use of your work (yes/no)?
- Allow modification of your work (yes/no)?

Software will generate license forms suitable for posting on the web that allow others to use your work without asking permission.

Intellectual Property and the Media Industry

Research by Bucknell students

What is Piracy?

- Software piracy is the illegal copying, distribution, or use of software.¹
- Online piracy: Typically involves downloading illegal software from peer-to-peer network, Internet auction or blog.¹
- “\$58 billion is lost to the U.S. economy annually due to content theft, including more than 373,000 lost American jobs, \$16 billion in lost employees’ earnings, plus \$3 billion in badly needed federal, state and local governments’ tax revenue.”⁶
- But others claim that piracy has advantages and media companies exaggerate the harm it does to the economy.⁶

Discussion Questions

- Should we never pirate? Is it inherently unethical?
- Is it justifiable in certain contexts?
 - What if you want to sample a few songs?
 - What if you can't find the product anywhere else?

Is Piracy Ethical? - Rule Utilitarianism

- Pros:
 - Everyone can enjoy free media.
- Cons:
 - If everyone pirated, then companies would have no incentive to produce more media.
 - The government would be likely to crack down on pirates.
- Conclusion:
 - Piracy is not ethical, since if everyone pirated, there would be a drastic reduction in the amount of media produced for people to enjoy.

Is Piracy Ethical? - Act Utilitarianism

- Pros:
 - Pirate can enjoy the product and does not need to spend any money.
 - The distributor of the pirated material can make money off of ad revenue.
- Cons:
 - Company loses money from the loss of a sale.
 - Potential legal ramifications for the pirate and distributor.
- Conclusion:
 - The morality is debatable, based on the likelihood of the legal ramifications. If the pirate would not have purchased the product and would not suffer legal consequences, then happiness would be maximized by pirating the product.

Is Piracy Ethical? - Social Contract

- Since people have the option to buy the products, they should give up the free version and buy the music. This creates a mutual benefit for the buyer and the creator.
- People have a right to own property, so pirates should not steal the intellectual property of others.
- Conclusion:
 - Piracy is not ethical according to the Social Contract Theory.

Is Piracy Ethical? - Kantianism

- If you worked and made a product, you would not want to give it away for free.
- Since it can be considered unethical in some cases, it should always be considered unethical. Any form of piracy is stealing and therefore unacceptable.

What is DRM?

- "Digital rights management (DRM) is a class of technologies that are used by hardware manufacturers, publishers, copyright holders, and individuals with the intent to control the use of digital content and devices after sale."²
- DRM enables companies to fight piracy by controlling what customers can do with their product.⁴
- However, DRM can often interfere with the customer's ability to use the product fully and drive away customers.⁴

Cases of DRM

- Sony released CDs that installed a rootkit, spyware that could not be removed without harming the computer.³
- Some games require Online Passes, which limits multiplayer use unless the game is new or the customer pays the company for a pass.⁵
- DVD of Terminator 2 produced by Artisan Home Entertainment Inc. required internet access to acquire a license, which was only granted to IP addresses from specific countries.⁷

Discussion Questions

- Is DRM good? Does it do its job in stopping pirates from stealing work?
- Should users have full access to it once they buy it?
- Does DRM get in the way of paying users?
- How far should you be able to go to protect your intellectual property?
 - Was Sony's rootkit ethical, or did they wrong their customers?

Is DRM Ethical? - Rule Utilitarianism

- Pros
 - Intellectual property theft would be reduced.
 - Cons
 - DRM would interfere with all forms of media. Users would have to pay for every instance of media individually, reducing how much they can access.
 - People would need to spend more on media, potentially harming other areas of the economy.
 - Hackers would go to greater lengths to break DRM.
- Conclusion: By rule utilitarianism, DRM is not ethical. The availability of media and information would be drastically reduced, reducing the happiness of a large number of people. Furthermore, hackers would be driven to break it, largely reducing its effectiveness.

Is DRM Ethical? - Act Utilitarianism

- Pros:
 - protects the creator from people using the product without paying for it, so the creator would make more money
 - Cons:
 - DRM gets in the way of people (both paying and not) from enjoying the work produced by others.
 - If given the option, no one would purposefully choose the product with DRM, because they would want the option to share it with friends
- Conclusion: Using DRM is debatably ethical. While the creator would receive payment for more of his products, all users of the product would enjoy it less, and some customers will avoid the product due to the DRM.

Is DRM Ethical? - Social Contract

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- People have the natural right to own property, and therefore should be able to freely utilize their property.
- Conversely, companies have a right to Intellectual Property, and should be able to protect their products.
- Conclusion:
 - The ethics of DRM are debatable according to Social Contract.

Is DRM Ethical? - Kantianism

- If you were the one making the product, you would want everyone to pay you for your work. Ideally, you would get paid by every user.
- Ideally, DRM should only protect a person's intellectual property without harming the user base.
- Conclusion:
 - Kantianism supports the use of DRM as a universal rule.

What are SOPA/PIPA?

- "The purpose of these bills is to make it harder for sites ... To sell or distribute pirated copyrighted material such as movies, music, as well as physical goods such as counterfeit purses and watches."⁵
- The idea is "good" to most lawmakers and creators, as they do not want people pirating their materials.
- Most are opposed to it because the solution to stop the pirating materials from being accessed, would actually cause entire websites to be blocked, not just the pages with pirating materials on them.
- They worry that SOPA and PIPA would lead to censorship abuse.

Discussion Questions

- Should the government try to clamp down more strongly on piracy?
- Should companies shut down peer to peer transferring sites?
- Is the government justifiable, given they can often be denials of the freedom of speech, or invasion of privacy?
- In the end, would the laws work? With the internet designed as it is, is it feasible to simply outright prevent piracy? Or, would it just put fuel on the fire for technology experts?
- Who is at fault? Should the hosts of the pirating websites/material be charged, or the people who pirate the material?

Are SOPA/PIPA Ethical? - Act Utilitarianism

- Pros:
 - Products are not stolen as much because the government stops sites from distributing them
- Cons:
 - Not everyone has free access to the Internet, most people would not be happy about this
 - People hosting pirating sites are thrown in jail
- Conclusion:
 - Total happiness decreases, because it limits content other than just pirating sites

Are SOPA/PIPA Ethical? - Social Contract

- Hobbes says "everyone living in a society implicitly agrees to having a government that is able to enforce these rules"
- Since the government is supposed to uphold and enforce the moral laws of the rational people, the government should be doing whatever the rational people decide are good moral laws.
- The people would decide that piracy is unethical by social contract standards (seen before), and thus the government should pass laws which help them enforce this decision by the people.
- Conclusion:
 - Their actions by lawmakers are ethical because they are passing laws to stop the unethical behavior of others.

Are SOPA/PIPA Ethical? - Kantianism

- Is it universally moral to control access to the internet?
- If this was always done by the government to suit its interests, it would deny the freedom of speech, preventing people from freely accessing information.
- It cannot be said that controlling the internet can be a universal ethical choice, so Kantianism rules against government sanctions against piracy.

Citations

- (2) http://en.wikipedia.org/wiki/Digital_rights_management
- (3) <http://www.wired.com/politics/security/commentary/securitymatters/2005/11/69601>
- (4) <http://www.pcworld.com/article/127790/article.html>
- (5) http://en.wikipedia.org/wiki/Online_pass
- (6) <http://www.nytimes.com/2012/02/09/technology/in-piracy-debate-deciding-if-the-sky-is-falling.html>
- (7) <http://www.hardwareanalysis.com/content/article/1765/>