



CPSC 2910 – Lesson 10

Intellectual Property

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Agenda

- **What is Intellectual Property?**
- **The Fair Use Doctrine**
- **The Digital Millennium Copyright Act**
- **Current Challenges**
- **Significant Rulings**
- **Responses to Copyright Infringement**
- **Free Software**
- **Discussion Topics**

Intellectual Property (IP)

Describes four separate but interrelated forms of exclusive rights in information -

Copyrights – most basic form of IP rights available; apply to the original expression, with a “mere modicum of creativity”, that anyone creates (raw facts cannot be copyrighted). Copyright is also the legal mechanism to keep some important work, such as open source software, available to the public: [Gnu General Public License \(GPL\)](#)

Patents – apply to inventions, technological improvements, certain designs, business methods, and some other narrow categories of innovation. Grant a powerful monopoly – the right to exclude others from using patented material – for a shorter time than copyrights but are more difficult to obtain. Can be seen as a bargain between the inventor and the public - the inventor discloses the invention in exchange for a 20-year monopoly on its use.

Trademarks – forms of protection to allow consumers to differentiate between different sources of products and make reliable decisions on the quality. Does not affect computer programming as other forms of IP, but may be important to appearance of GUIs, video games, etc.

Trade Secrets – pseudo-property right to use when the imitation or costs of other methods are unacceptable for a given application.

Copyright – Fair Use Doctrine

Fair Use Doctrine (general) -

- Defines fair usage and gives examples of activities that are likely to be considered fair use, including copying for purposes of –
 - Criticism
 - News reporting
 - Teaching
 - Reverse engineering of software
- Courts must apply a four-part test every time they consider a fair use claim –
 - Purpose and character of use - commercial or non-profit
 - Nature of the copyrighted work, including how creative the original copyrighted work is
 - Amount or substantiality (significance) of the portion copied
 - Effect of the copying upon the market for copyrighted work

Copyright – Fair Use Doctrine

Fair Use Doctrine (reverse engineering of software) -

- In traditional media formats (e.g. books or art), copyright represents a bargain between the inventor (e.g. author or artist) and the public – the inventor has an exclusive right to make and sell copies, but anyone can look at the work, learn from its ideas, and use those ideas in new ways to “promote the progress of science and useful arts”.
- For software, only available as object code, the bargain is one-sided – the inventor gets a monopoly, but the public has no access to even the uncopyrightable ideas contained in the code.
- Courts have largely ruled that decompilation that is carried out solely for the purpose of gaining access to unprotected functional elements of a program in order to create interoperable systems is legal in some circumstances.

Copyright – Challenges

Content industries claim that about 25% of internet traffic worldwide consists of copyright-infringing material!

- Digital technology and the internet make copyright infringement easier and cheaper
- New compression technologies make copying large files (graphics, video, etc.) feasible
- Search engines make finding material easier
- Peer-to-peer technology makes transferring and sharing files easier
- Broadband connection make transferring files easier and enables streaming video
- Miniaturization of cameras and other equipment enable audience members to record and transmit events
- Scanners allow us to change the media of a copyrighted work, converting printed text, photos, and artwork to electronic form
- New tools allow us to modify graphics, video, and audio files to make derivative works

Copyright – Significant Rulings

Sony v Universal Studios (1984) – Supreme Court decided that the makers of a device with legitimate uses should not be penalized because some people may use it to infringe on copyright – copying movies for later viewing was fair use.

Sega v Accolade, Nintendo v Atari (1992) – courts ruled that reverse engineering does not violate copyright if the intention is to make new creative works (in this case, video games), not copy the original work (the gaming system).

Napster (early 2000s) – courts ruled that sharing music via copied MP3 files violated copyright. Napster was found liable because they had the right and ability to supervise the system, including copyright infringing activities.

Digital Millennium Copyright Act -

<https://courses.cs.duke.edu/cps182s/fall02/cscopyright/Copyrights/Copyright-DMCA.htm>

Protecting IP

Software responses –

- Expiration dates within the software
- Copy protection that prevents copying
- Activation or registration codes
- Court orders to shut down internet bulletin boards and web sites

Banning, suing, or taxing –

- Ban or delay technology via lawsuits (e.g. CD recording devices)
- Require that new technology include copyright protections
- Tax digital media to compensate the industry for expected losses

Digital Rights Management (DRM) –

- Collection of techniques that control uses of intellectual property in digital format
- Includes hardware and software schemes using encryption
- The producer of a file has flexibility to specify what a user may do with it

International Piracy

International Piracy -

- Some countries do not recognize or protect intellectual property
- Countries that have a high piracy rate often do not have a significant software industry
- Many countries that have a high amount of piracy are exporting the pirated copies to countries with strict copyright laws
- Economic sanctions often penalize legitimate businesses, not those they seek to target

Free Software

Free software – an idea supported by a large, loose-knit group of computer programmers who allow people to copy, use, and modify their software -

- Free means freedom of use, not necessarily lack of cost
- Open source – software distributed or made public in source code (readable and modifiable)
- GNU project
 - Began with UNIX-like operating system, a sophisticated text editor, and many compilers and utilities
 - Now has hundreds of programs freely available and thousands of software packages available as free software (with modifiable source code)
 - Developed the concept of copyleft

Discussion Topics

Using the book and articles mentioned in this lecture as a guideline, answer the following –

Copyright – What do you think the impact would be on creative industries, such as music, movies, and fiction works, if copyright laws did not protect intellectual property?

Free Software – Should all software be free? Would there be sufficient incentive to produce the huge quantity of consumer available now?

Free Software – Should all software be free? Would the current funding methods for free software be sufficient to support all software development?

In-Class Work

Individually – answer this week’s discussion post in Canvas

Free Software –

- Work to complete the online discussion post – due by midnight.
- Individual responses to other posts due midnight before next week’s class.

Reading and Discussion Rubric-Sp22		
Criteria	Ratings	Pts
Provided thoughtful answer to the specified question. Showed thought and reflection in their answer. Referenced key elements of the article to back up their answer.	This area will be used by the assessor to leave comments related to this criterion.	12.5 pts
Commented on at least 2 classmate answers. Provided a thoughtful response either supporting or challenging an answer provided by two of their classmates answers.	This area will be used by the assessor to leave comments related to this criterion.	5 pts
No major grammar or spelling issues in the submission. Shows an attention to detail by ensuring that the grammar and spelling are correct in their submission.	This area will be used by the assessor to leave comments related to this criterion.	2.5 pts
Total Points: 20		

Looking Ahead

Next week – 4/12 Guest Speaker

The following week – 4/19 -

- Reading and Online Discussion –

Read <https://www3.bostonglobe.com/metro/2014/03/29/the-inside-story-mit-and-aaron-swartz/YvJZ5P6VHaPJusReuaN7SI/story.html?arc404=true> (also available as .pdf in Canvas)

- Be prepared to discuss as a class and in small groups next week. You will work together in class to complete the online discussion post, so it is important that you **READ AHEAD**.
- In-class quiz on this week's topics

Questions?

Use our Teams channel first – this is preferred for general questions!

- Prof Russell - crusse4@clemson.edu
- Matt Bernard - mberna2@clemson.edu