CS305 Topic – Intellectual Property

- Intellectual Property
- Protecting Intellectual Property
- Copyright and Fair Use
- Challenges

Sources: Baase: A Gift of Fire *and* Quinn: Ethics for the Information Age

What is Intellectual Property?

- Any unique product of the human intellect that has commercial value
  - Books, songs, movies
  - Paintings, drawings
  - Inventions, chemical formulas, computer programs
- Intellectual property ≠ physical property

Protecting IP

Two competing goals:

- *Benefiting the society* — want inventions to reach the public domain without delay
- *Rewarding the creators* — want to promote future inventions

Solution:

Gov't grants *limited* ownership rights to IP creators

Protection Types:

Trade secrets, Trade secrets, Patents, and Copyrights

Trade Secrets

A trade secret is a confidential piece of IP that provides a company with a competitive advantage. *E.g.*

- the formula for Coca-Cola syrup
- the internal design of a system
- customer lists

Protections:

- Owners must take active measures to keep their trade secrets from being discovered
  - Locked boxes
  - Non-disclosure agreements (NDA) and non-compete clauses
- The Uniform Trade Secrets Act (UTSA)
  - Imposes civil liability for misappropriation of trade secrets

Trademarks

A trademark is a word, a logo, a sound, etc, that identifies a company or a product.

Protections:

- Company can sue for improper use of its trademark
- However, if a trademark name becomes common noun, trademark may be lost. *E.g.*
  - *aspirin, escalator, thermos, xerox, yo-yo*

Patents

A public document that provides detailed description of invention.

- Provides owner with exclusive right to the invention
- Owner can prevent others from making, using, or selling invention for 20 years

Copyrights

Provides owner of an original work *five* rights

- Reproduction
- Distribution
- Public display
- Public performance
- Production of derivative works

The length of the protection is defined by copyright laws (which have been expanded greatly over the years).

Fair Use

Under some circumstances, it is legal to reproduce a copyrighted work without permission.

Courts consider four factors:

- *Purpose and character of use*
  - Educational use is generally OK
- *Nature of work*
  - Nonfiction and non-arts work are more permissible
- *Amount of work being copied*
  - Small portions are more permissible
- *Effect on the commercial market for work*
  - Should have a negligible effect

Fair Use Examples

- A professor scan a few journal articles and post them on his class website. Students in class use password to access. *(OK)*
- An art professor takes slide photos of some paintings from a book, and uses the slides in her lectures. *(Maybe not OK)*

IP Protection Challenges

- Digital copies:
  - Easy to make perfect copies of CDs, DVDs
  - Easy to download books, music, and videos
  - Peer-to-peer network allow strangers to share music and other data files

The RIAA has filed more than 26,000 lawsuits against individuals for illegal downloading since 2003.

- Tanya Andersen (case dropped)
- Jammie Thomas (fined $222K for sharing 24 songs)

IP Protection Challenges (cont.)

- Fair Use Issues:
  - How to draw the line?
  - How to protect legal fair use right?
- Software Protection?
  - Should software be copyrighted?
  - Should software be patented?

Answers to the Challenges

- *Prevention* —
  - Digital IP Protection Techniques (e.g. DRMs)
- *Tracking* —
  - Digital Watermarking
- *Punishing* —
  - Extending Copyright Laws

This is an on-going process. Some of the changes are controversial.

Significant Fair Use Cases

- *Sony v. Universal City Studios [1976]:*
  - *Issue:* Using VCR to tape TV programs for later viewing
  - *Verdict:* Time shifting is fair use. (US Supreme Court 5-4)
- *RIAA v. Diamond Multimedia Systems [1998]:*
  - *Issue:* Transforming music CDs to MP3 format and playing on the Rio player
  - *Verdict:* Space shifting is fair use.

Significant Reverse Engineering Cases

- *Sega v. Accolade [1992]:*
  - *Issue:* Accolade made video games to run on Sega game machines; to do so, they decompiled Sega's game engine
  - *Verdict: R*everse engineering does not violate copyright if the intention is to make new creative works, not copy the original work
- *Atari v. Nintendo [1992]*
- *Sony v. Connectix [2000]*

Significant File Sharing Cases

- *RIAA v. Napster [2001]:*
  - *Issue:* Peer-to-peer music exchange network
  - *Verdict:* Web sites could be liable for users' actions if they took measures that deliberately encouraged users to do illegal things (*Secondary Infringement*)

Background:

- Napster was started by a Northeastern student in the summer of 1999. In two years, it had 26 million registered users.
- In court, Napster argued that it did not copy *any* files; it merely providing a directory service.

Significant File Sharing Cases

- *MGM v. Grokster [2005]:*
  - *Issue:* Decentralized p2p file-sharing network
  - *Verdict:* In favor of MGM (by the Supreme Court)

    "We hold that one who distributes a device with the object of promoting its use to infringe copyright, as shown by clear expression or other affirmative steps taken to foster infringement, is liable for the resulting acts of infringement by third parties."

    Grokster case's evidence: Grokster advertised "an infringe use" of its service

DRM Examples (for CDs)

- Exploit difference between CD-ROM drives in computers and CD players (“Yellow Book” vs. “Red Book”)
- Encode patterns into audio that translate into annoying sounds when decoded
- Secure Digital Music Initiative — introduces a “digital watermarking” scheme

DRM Examples (for DVDs)

- *Content Scramble System (CSS)* —
  An encryption scheme for DVD contents. Need decryption keys to view a DVD.
  Status: In use, but crack code exists

An Important Case:

Jon Johansen wrote a decryption program for Linux:

- *2600.com* published the code
- Motion picture studios sued *2600.com* and won
- Johansen tried in Norway and found not guilty

Criticisms of DRM

- DRM undermines fair use
- Some DRM schemes track user information
- DRM protections never expire (unlike copyrights)

Many people believe that any technological “fix” is bound to fail. The alternative?

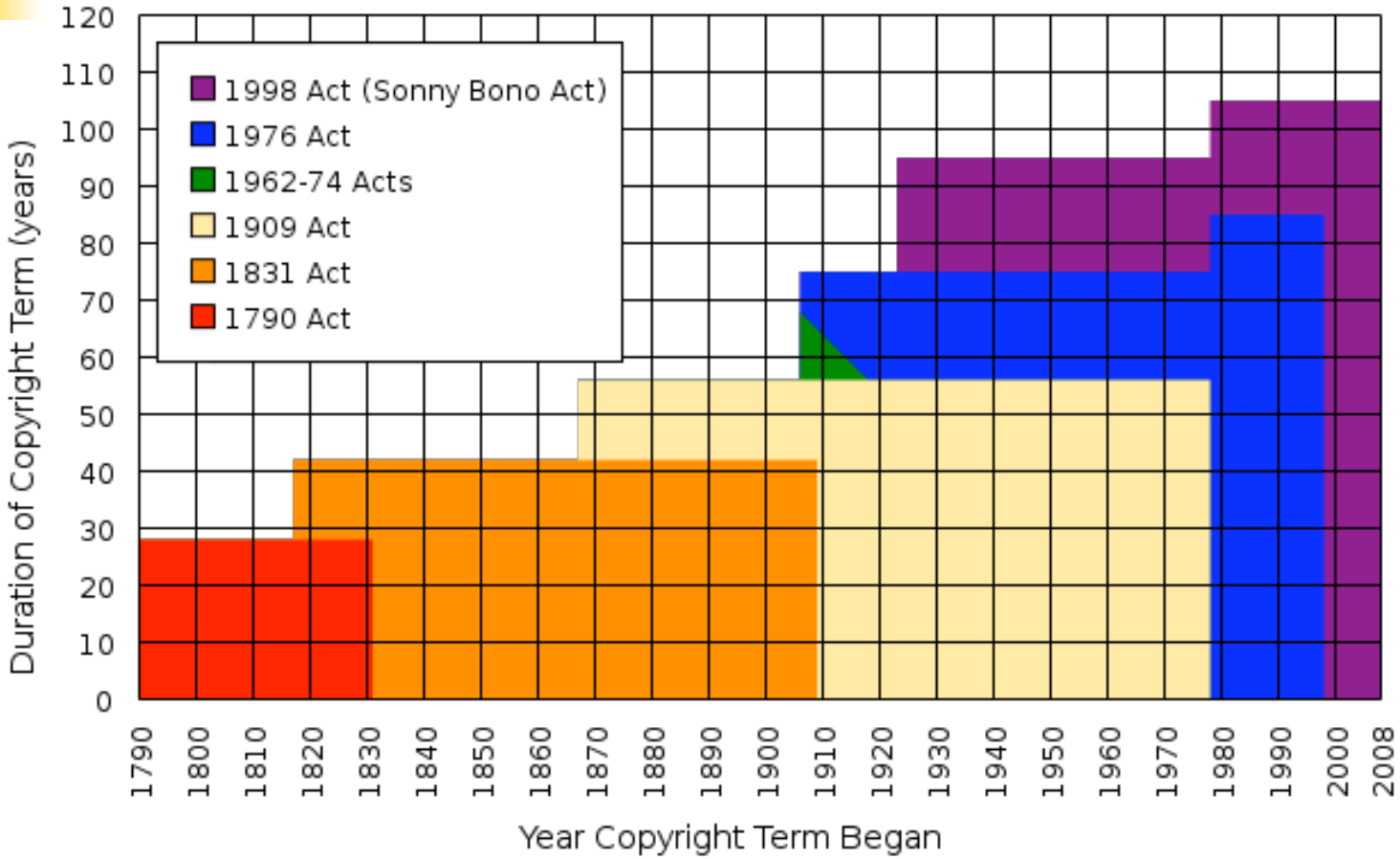
US Copyright Laws

First copyright law was passed in 1790; provided **28** (14+14) years of protection for books.

Each subsequent revision broadened coverage scope *and* increased protection period:

- *1831 Act* – prints and sheet music; **42** years
- *1909 Act* – photos, recordings, movies; **56** years
- *1976 Act* – software and databases; **75** years
- *1998 Act* – music broadcast over the Internet; author's lifetime + **95** years

Copyright Law Revisions



(Picture from Wikipedia by Tom Bell)

Criticisms of Longer Protection

Constitution's stated *purpose of copyright law*:

> [Article I, Section 8, Clause 8] Congress shall have the power: "*to promote the Progress of Science and useful Arts*, by securing for limited times to Authors and Inventors the exclusive Right to their Respective Writings and Discoveries."

Longer Protection

- Benefits only the few owners of franchises
  - *1998 Act* is called "*Mickey Mouse Protection Act*"
- Will shift progress of science and arts offshore
  - where copyrights would have expired

Harsher Punishments

- *No Electronic Theft (1997):*
  - Any unauthorized copying with retail value >$1000
- *Digital Millennium Copyright Act (1998):*
  - Many copyright violations become felonies
- *Digital Theft Deterrence and Copyright Damages Improvement Act (1999):*
  - Minimum $750 for each infringement
  - Up to 5 yrs in prison or $500K fine for *first* offense

Digital Millennium Copyright Act

Passed in 1998, but is still controversial.

- DMCA makes circumventing copy control a felony, even if it is for fair use purpose.

  Some Consequences:

  - While making a personal copy of music CD is fair use, it is illegal to do so for movie DVDs
  - It is illegal to play a DVD on a GNU/Linux machine
- OSP may be held liable (and face severe penalties) for copyright violations by its users
  - Viacom v. YouTube lawsuit is on-going

Software Protection

- *Utilitarian Arguments:*
  - Copying software reduces software purchases
  - Leading to less income for software makers
  - Leading to lower production of new software
  - Leading to fewer benefits to society
- *Rights-Based Arguments:*
  - Programming is hard work that only a few can do
  - Programmers should be rewarded for their labor
  - They ought to be able to own their programs

Software Copyrights

- Included in 1976 copyright law revision
- What gets copyrighted?
  - Expression of idea, not idea itself
  - Object code, not source code

    (Companies treat source code as a trade secret.)
- Examples of violations:
  - Copying a program to give or sell to someone else
  - Preloading a program onto the hard disk of a computer being sold
  - Distributing a program over the Internet

Software Patents?

- Software is patentable if it contains a mathematical formula and implements it in a structure, which performs a patentable function.
- Patents are not to be given for things that are obvious or are already in common use.
  - But it is hard to determine what is “obvious.”
  - *Result:* Some bad patents have been issued

Software Patent Examples

- Data compression schemes:
  - GIF, JPEG, MP3, RSA
- Internet tools:
  - pay-per-click ad, plug-in browser
- User interfaces:
  - progress-bar, force-feedback (in game controller)

Criticisms of Software Patents

- Cost is too high.
- Traditional copyright has provided sufficient protection.
- Most software patents cover trivial inventions or trivial extensions of existing technologies.
- Lack of patent application disclosure – Patent applications are published 18 months after they are filed.

Open-Source Software

Opposite answer to proprietary software.

- 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

Copyleft: (e.g. GPL)

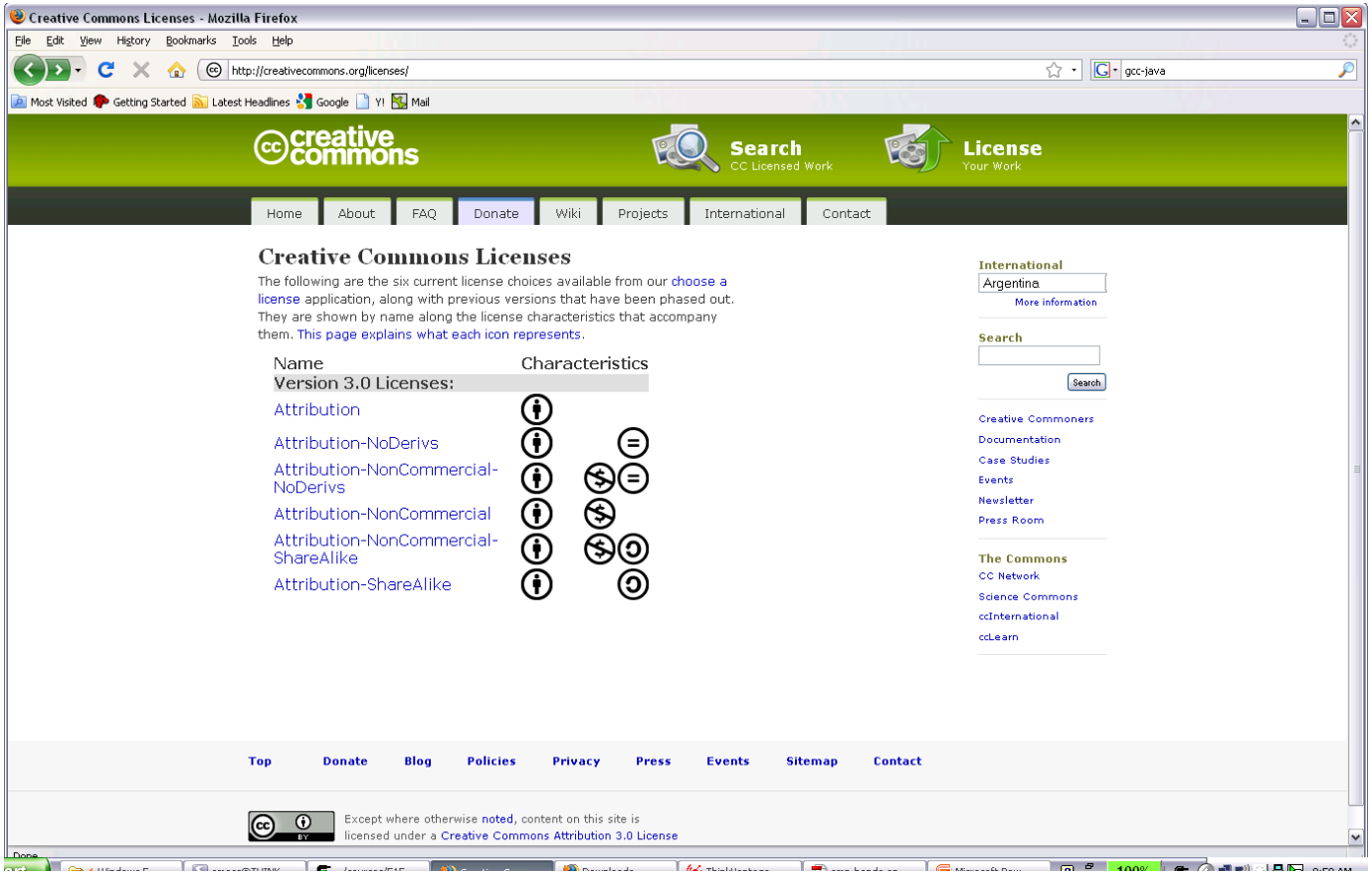
Free to modify and redistribute as long as the same rights apply to everyone receiving the software

Creative Commons Licenses

- In 2001, a group of professionals created the non-profit corp. *Creative Commons* to provide copyright licenses free of charge.
- It allows the author to decide the extent of IP protection, e.g.
  - Free copy, modify, and distribute, but no commercial use
  - Free copy and distribute, but no modification or commercial use

  Many Wikipedia pictures are protected by CCL

Creative Commons (cont.)



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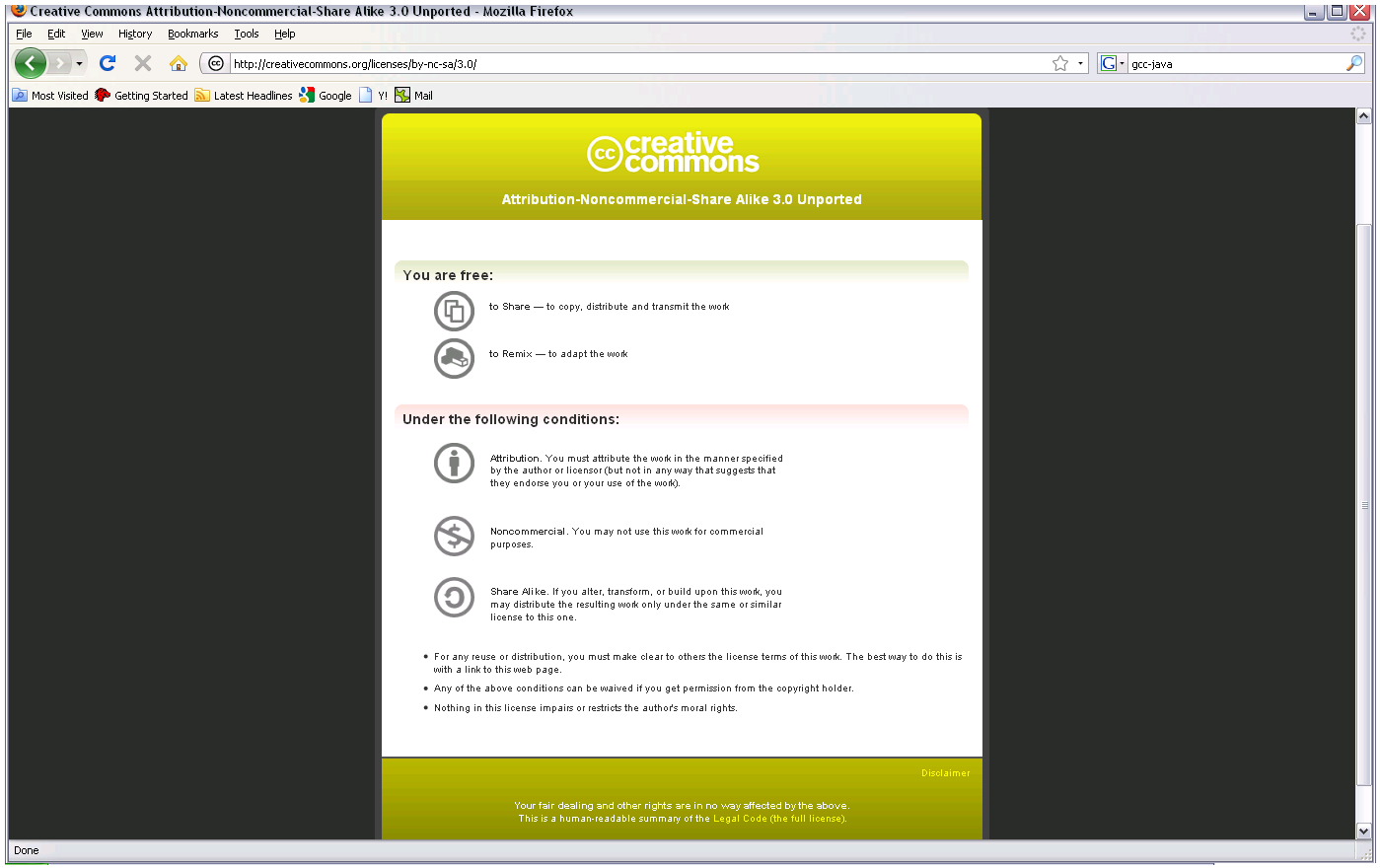

Open-Source Benefits

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

Criticisms of Open-Source

- Without an “owner,” incompatible versions may arise
- Without critical mass of developers, quality can be poor
- Relatively weak graphical user interface
- Poor mechanism for stimulating innovation – no companies will spend billions on new programs

Discussion Questions

- A software service company A has a client C. C uses a software S made by company B. Company A made a copy of S, not to resell, but to provide service to C. Company B sued, and company A argues that the copying was a fair use. Give arguments for each side. Which side do you think should win?
- Consider applying the fair-use guidelines to making a video of oneself lip-synching to a popular song and posting the video on a social-networking site. Do you think it is ethical to do this?

Discussion Questions

- Which is more likely to be effective in protecting intellectual property in digital media (e.g. CDs, DVDs):
  - Tougher copyright laws
  - New technologies incorporating more sophisticated anti-copying measures
- As the copying of digital texts, audio, and video grows cheaper, the restrictions needed to enforce copyright grow more expensive and invasive. Does copyright have a future in the digital age? Or are new technologies steadily making it obsolete?