

Computers and Society

Intellectual Property (2) Patent, Copy-Right and Software Industry

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

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Protections for Software

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Software Copyrights

- Copyright protection began 1964
 - A program submitted by North America Aviation
 - A program on tape and in printed form by a Columbia law student
- What gets copyrighted?
 - Expression of idea, not idea itself
 - Object program, not source program
- Companies treat source code as a trade secret

<http://digital-law-online.info/lpd1.0/treatise17.html>

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Violations of Software Copyrights

- 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

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Important Court Cases

- *Apple Computer v. Franklin Computer*
 - Established that object programs are copyrightable
- *Sega v. Accolade*
 - Established that disassembling object code to determine technical specifications is fair use

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Software Patents (1/3)

- Until 1981, Patent Office refused to grant software patents
 - Saw programs as mathematical algorithms, not processes or machines
- U.S. Supreme Court decision led to first software patent in 1981
 - *Diamond v. Diehr*
- Further court rulings led to patents being granted for wider range of software

http://en.wikipedia.org/wiki/Diamond_v._Diehr

http://www.oyez.org/cases/1980-1989/1980/1980_79_1112/

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Software Patents (2/3)

- Thousands of software patents now exist
 - Microsoft files ~3,000 applications annually
 - Licensing patents a source of revenue
- Secondary market for software patents
 - Patent trolls: Companies that specialize in buying patents and enforcing patent rights
 - Companies would rather settle out of court than spend time and money going to trial
 - RIM didn't settle quickly with NTP; ended up paying \$612 million

Software Patents (3/3)

- Critics say too many patents have been issued
 - Patent Office doesn't know about prior art, so it issues bad software patents
 - Obvious inventions get patents
 - <http://www.gnu.org/philosophy/trivial-patent.html>
- Companies with new products fear getting sued for patent infringement
 - Build stockpiles of patents as defense mechanism
 - Software patents used as legal weapons
- Bezos: software patents should expire in 3-5 years

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

Open-Source Software

Consequences of Proprietary Software

- Increasingly harsh measures being taken to enforce copyrights
- Copyrights are not serving their purpose of promoting progress
- It is wrong to allow someone to “own” a piece of intellectual property

Open-Source Definition

- 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)

<http://en.wikipedia.org/wiki/Copyleft>

Beneficial Consequences of Open-Source Software

- 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

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Examples of Open-Source Software

- BIND <http://en.wikipedia.org/wiki/BIND>
- Apache http://en.wikipedia.org/wiki/Apache_HTTP_Server (Free Software)
- Sendmail <http://en.wikipedia.org/wiki/Sendmail>
- Android operating system for smartphones [http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))
- Firefox <http://en.wikipedia.org/wiki/Firefox>
- OpenOffice.org <http://en.wikipedia.org/wiki/OpenOffice.org>
 - LibreOffice <http://en.wikipedia.org/wiki/LibreOffice>
- Perl, Python, Ruby, TCL/TK, PHP, Zope
- GNU compilers for C, C++, Objective-C, Fortran, Java, and Ada (Free Software)

https://directory.fsf.org/wiki/Main_Page

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GNU Project and Linux

- GNU Project (GNU is Not Unix)
 - Started by Richard Stallman in 1984
 - Goal: Develop open-source, Unix-like operating system and its systems software
 - Most components developed in late 1980s
- Linux
 - Linus Torvalds wrote Unix-like kernel in 1991
 - Combined with GNU components to make an O.S.
 - Commonly called Linux

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Impact of Open-Source Software

- Linux putting pressure on companies selling proprietary versions of Unix
- Linux putting pressure on Microsoft and Apple desktops

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Critique of the Open-Source Software Movement

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

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Legitimacy of Intellectual Property Protection for Software

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Do We Have the Right System in Place?

- Software licenses typically prevent you from making copies of software to sell or give away
- Software licenses are legal agreements
- Not discussing morality of breaking the law
- Discussing whether society *should* give intellectual property protection to software

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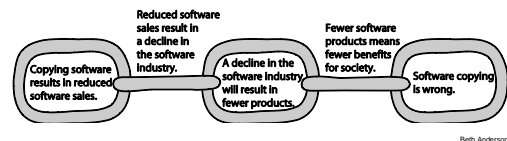
Rights-based Analysis

- “Just deserts” argument
 - 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
- Criticism of “just deserts” argument
 - Why does labor imply ownership?
 - Can imagine a just society in which all labor went to common good
 - Intellectual property not like physical property

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A Consequentialist Argument Why Software Copying Is Bad



Consequentialism is an umbrella term of pursuing moral standards or ethics based on the results of the action(s), not by the characters.

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Utilitarian Analysis

- Argument against copying
 - 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
- 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
 - Difficult to quantify how much society would be harmed if certain software packages not released

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Conclusion

- Natural rights argument weak
- Utilitarian argument not strong, either
- Nevertheless, society has granted copyright protection to owners of computer programs
- Breaking the law is wrong unless there is a strong overriding moral obligation or consequence

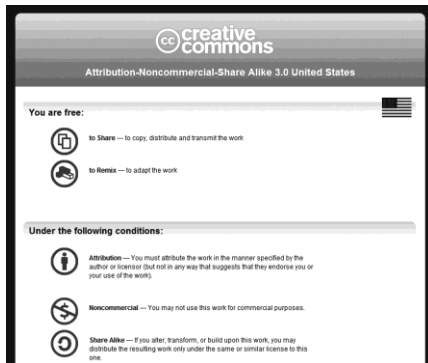
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Creative Commons

Streamlining Creative Re-use

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



Screenshot from Creative Commons. Copyright © 2011 by Creative Commons. Reprinted with permission.

Intellectual Property (Software)

Research by Bucknell students

Is This the Beginning of the End for Patent Trolls? We Hope So.

- Sovereign Software vs. Newegg
 - Shopping Cart patent
 - Sued companies such as Amazon, Nordstrom, Macy's and Newegg
 - Appealed court against Newegg
 - Wanted more money
 - Patent was too general
 - Case thrown out

Patent Trolls

- Purchase patents without the intention of use
- A means of revenue
- Often sue small businesses
- Patent trolls tend to get more money than if an actual patent holder had sued

Questions

- Should people or organizations be able to purchase patents without the intention of using them?
- Should there be different restrictions on software patents depending on their generality?

Act Utilitarianism

Benefits	Harms
\$\$\$\$\$ for Patent trolls	Original patent holder does not benefit
Gives small inventors the ability to protect their intellectual property	

Tech companies are more likely to steal the idea behind a patent. Therefore patent trolls can become a better option for small inventors.

Conclusion: Undetermined

Rule Utilitarianism

Benefits	Harms
\$\$\$\$\$	Decrease the amount of new software production
	The purpose of patents is diminished

The purpose of a patent is to stimulate growth and invention. Patent trolls diminish creativity by attacking new ideas.

Conclusion: Immoral

Social Contract

- Patent is a social contract that give the patent holder the right to sue those that infringe upon their intellectual property rights.
- Conclusion: Ethically right

Microsoft vs. Apple

- Operating System battle of ideas
- Back and forth stealing of the opposing operating systems features
- Going on since the beginning of the Personal Computer

Questions

- Does the stealing of this information benefit the end user?
- If the stealing of information benefits a large audience does this make it morally correct?

Kantianism

- I don't want others to steal from me, therefore I am not going to steal from others.
- Are there cases where people want their ideas stolen? (Open Source)
- Conclusion: Immoral

Act Utilitarianism

Benefits	Harms
End user experience better	Loss of customers due to lack of competitive edge
Stimulates invention	

Conclusion: Undetermined

Rule Utilitarianism

Benefits	Harms
All good ideas available to all inventors (Super product)	Lack of motivation to invent
	All products essentially the same

Conclusion: Inconclusive

Zuckerberg vs. Winklevoss Twins

- Winklevoss Twins ask Zuckerberg to join on their business venture
- Zuckerberg essentially steals the idea or so they claim
- We are going to assume that Zuckerberg stole the idea from the Winklevoss Twins

Questions

- Was it morally wrong for Zuckerberg to steal the idea when he knew that the Winklevosses were incapable of implementing the idea themselves?
- Can you steal an Idea?

Social Contract Theory

- Winklevoss twins shared the idea with the intention of working alongside Zuckerberg
- Zuckerberg broke the social contract
- Conclusion: Immoral.

Rule Utilitarianism

Benefits	Harms
More ideas are implemented to create the best quality product	Creative ideas are no longer rewarded

Conclusion: Beneficial for society

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Open Source vs. Proprietary (Survey)

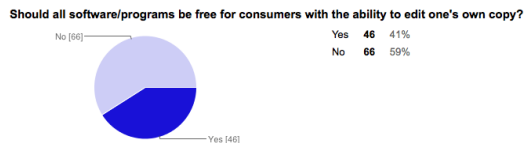
What is your current Major/Majors?

Should all software/programs be free for consumer with the ability to edit ones own copy?

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Results



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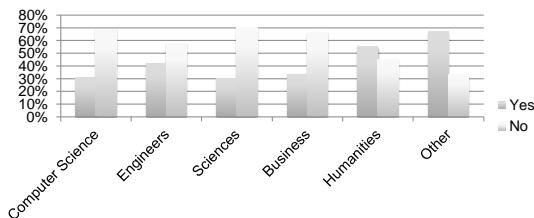
Breakdown (responses)

- Engineering (non Computer Science and Engineers): 24
- Sciences: 23
- Humanities: 31
- Business/Management: 15
- Computer Science: 16
- Other: 3

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Results by Field



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Conclusions

- In general, across most majors, students are against Open Source software
- Business and Science Majors strongly apposed Open Source software
- Conclusion: Immoral

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Open Source vs. Free

- Pros (for Open Source)
 - Customizable software
 - Make other software better
 - Large network of developers
- Cons (against Open Source)
 - Users with little to no programming experience “breaking” software
 - Using and selling code found from open Source software