

# CS 4873-A: Computing and Society

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## Week 10: Intellectual Property

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# Introduction and Intellectual Property

# Some ethical questions

- Is it fair for some people to watch shows for free when others are paying to view them?
- Do entertainers have the right to control who sees and hears a performance of their music?

# Some ethical questions

- Government has put many protections for intellectual property; the legal system has given more rights to the creators of intellectual property.
- Are these changes in the best interests of our society, or are politicians catering to special interest groups?

# What is Intellectual Property?

- 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  $\neq$  physical manifestation
- Does right to own property extend to intellectual property?

# Information Technology Changing Intellectual Property Landscape

- Value of intellectual properties much greater than value of media
  - Creating first copy is costly
  - Duplicates cost almost nothing
- Illegal copying pervasive
  - Internet allows copies to spread quickly and widely
- In light of advances in information technology, how should we treat intellectual property?

# Locke's Notion of Property Rights



# Property Rights

- Locke: *The Second Treatise of Government*
- People have a right...
  - to property in their own person
  - to their own labor
  - to things which they remove from Nature through their labor
- As long as...
  - nobody claims more property than they can use
  - after someone removes something from common state, there is plenty left over



# Expanding the Argument to Intellectual Property

- Writing a play akin to making a belt buckle
- Belt buckle
  - Mine ore
  - Smelt it down
  - Cast it
- Writing a play
  - “Mine” words from English language
  - “Smelt” them into prose
  - “Cast” them into a complete play

# Analogy is Imperfect: Class Discussion 1a

## **Scenario A, Act 1**

After a day of rehearsals at the Globe Theater, William Shakespeare decides to have supper at a pub across the street. The pub is full of gossip about royal intrigue in Denmark. After his second pint of beer, Shakespeare is visited by the muse, and in an astounding burst of energy, he writes Hamlet in one fell swoop.

Can you apply Locke's property rights framework to protect Shakespeare's intellectual property in this case?

# Analogy is Imperfect: Class Discussion 1b

## **Scenario A, Act 1**

After a day of rehearsals at the Globe Theater, William Shakespeare decides to have supper at a pub across the street. The pub is full of gossip about royal intrigue in Denmark. After his second pint of beer, Shakespeare is visited by the muse, and in an astounding burst of energy, he writes Hamlet in one fell swoop.

## **Scenario A, Act 2**

On the very same night, Ben Jonson, at a pub on the opposite side of London, hears the same gossip, is struck by the same muse, and writes Hamlet – exactly the same play.

Can you apply Locke's property rights framework to protect Shakespeare's intellectual property in this case?

# Analogy is Imperfect: Class Discussion 1c

## Scenario B

One evening Shakespeare stays up all night writing Hamlet in a pub. He returns to Globe Theater next morning, but carelessly leaves his writing in the pub. Jonson stops by for breakfast the next morning and finds the copy of Hamlet. He transcribes and copies it, and walks out of the door with it in his possession, leaving the original copy where it was.

Can you apply Locke's property rights framework to protect Shakespeare's intellectual property in this case?

# Benefits of Intellectual Property

- Some people are altruistic; some are not
- Allure of wealth can be an incentive for speculative work
- Authors of U.S. Constitution recognized benefits to *limited* intellectual property protection

# Limits to Intellectual Property Protection

- Giving creators rights to their inventions stimulates creativity
- Society benefits most when inventions in public domain
- Congress has struck compromise by giving authors and inventors rights for a limited time



# Protecting Intellectual Property

# Protecting Intellectual Property

- Trade secrets
- Trademarks and service marks
- Patents
- Copyrights



# Trade Secret

- Confidential piece of intellectual property that gives company a competitive advantage
- Never expires
- Not appropriate for all intellectual properties
- Reverse engineering allowed
- May be compromised when employees leave firm

# Trademark, Service Mark

- Trademark: Identifies goods
- Service mark: Identifies services
- Company can establish a “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



## If a trademark is misused it could come undone.

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# Patent

- 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

# Licensing Patents

- Microsoft invented a software technology called ClearType that improves the clarity of text in LCD/LED monitors.
- It is protected by 10 patents.
- In 2003 Microsoft started to license it to other companies with a certain royalty rate.

# Software Patents

- Inventions can be patented, but not algorithms
- Patent Office having a hard time determining prior art
- Result: some bad patents have been issued
- General skepticism about value of software patents

# Software Copyrights

- Copyright protection began 1964
- What gets copyrighted?
  - Expression of idea, not idea itself
  - Object program, not source program
- Companies treat source code as a trade secret

# Software Copyrights

- Provides owner of an original work five rights
  - Reproduction
  - Distribution
  - Public display
  - Public performance
  - Production of derivative works
- Copyright-related industries represent 6% of U.S. gross domestic product (> \$900 billion/yr)
- Copyright protection has expanded greatly since 1790



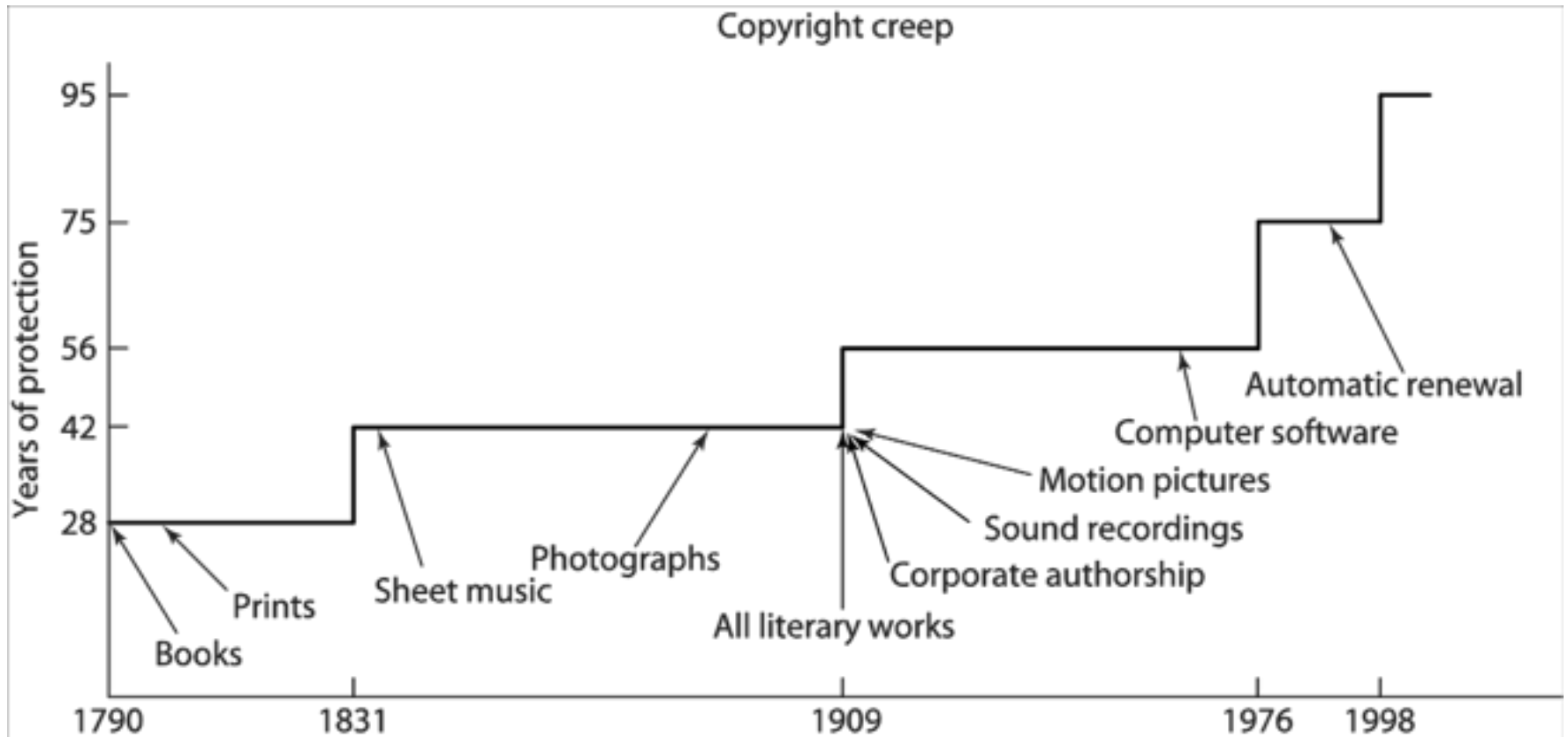
# Violations of Software Copyrights

- 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

# Copyright Creep

- Since 1790, protection for books extended from 28 years to 95 years or more
- Some say latest extension done to prevent Disney characters from becoming public domain
- Group of petitioners challenged the Copyright Term Extension Act of 1998, arguing Congress exceeded Constitutional power
- U.S. Supreme Court ruling
  - CTEA does not create perpetual copyrights
  - CTEA is constitutional

# Copyright Creep



# Legitimacy of Intellectual Property Protection for Software

- IP protections of software allows entities to profit; people have to work harder to succeed; more innovation
- Software licenses typically prevent you from making copies of software to sell or give away
- Software licenses are legal agreements
- Violations (e.g., copying a proprietary software) are not argued morally, but handled in legal terms
- Discuss whether society *should* give intellectual property protection to software

# 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

# 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

# Open Source 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
- Same rights apply to everyone receiving redistributions of the software

# 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



# 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)