

Lecture 6.1

Intellectual Property



CS 230: Ethical Issues in Computing
Fall 2020
Dr. Henderson
BSU

Announcements

- Quiz retakes
- LA-4 due Thursday
 - Video post remember to submit
- Challenge resubs
- Oral Presentation Topics Posted
- Office Hours – Mon/Wed 13:00-14:00

LA-4 Challenge B - Burnout

- How does your tech job burn you out?
- CS Retention: 6yrs – 57%, 20yrs – 19%
- By early 40s only 1 in 5 still programming
- Advice from veterans:
 - Work at a place you can grow
 - Build transferable skills (leadership, mgmt)
 - Creative outlets; switch off, relax
 - Move enough, eat well, quality time with friends and family

Last Time

- Censorship
 - Direct
 - Self
- Freedom of Expression
- Network Threats
 - Identity Theft, Predators, False Info, Cyberbullying, etc.
- Internet Addiction

Today

- Intellectual Property Rights
 - Philosophy of Property Rights
 - Intellectual Property
 - What is it?
 - How is it protected?
 - Digital Challenges
 - IP Legal Protections Today
 - Fair Use

Property Rights

- The right to acquire, use, and dispose of property freely
- “Property must be secured or liberty cannot exist.”
- John Adams
- “Private property and freedom are inseparable.”
-George Washington
- Recognized in US Constitution, Universal Declaration of Human Rights, European Convention on Human Rights and many more
- John Locke – theory of property rights

Intellectual Property (IP)

- Creations of the mind vs. physical objects
- Songs, Paintings, Books, Films, Inventions, Symbols, Names
- Transcend the medium

IP Ownership and Protection

- Value = expressing through sharing copies
- Ownership = the exclusive right to make copies
- Protection = Copyright laws

What is original?



VS

Led Zeppelin



Copyrights in Derivative Work



VS

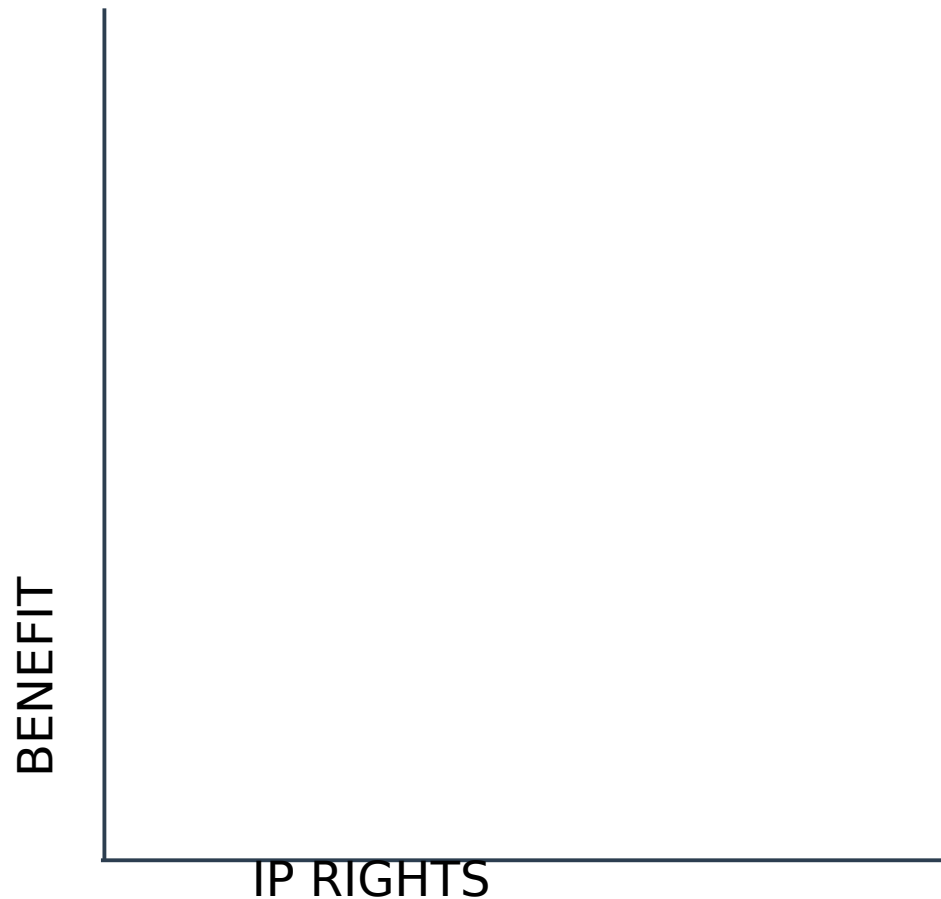


Intellectual Property Rights

- Protect ownership of new ideas
- Allow inventors to benefit from their efforts
- Allow society to benefit from innovation

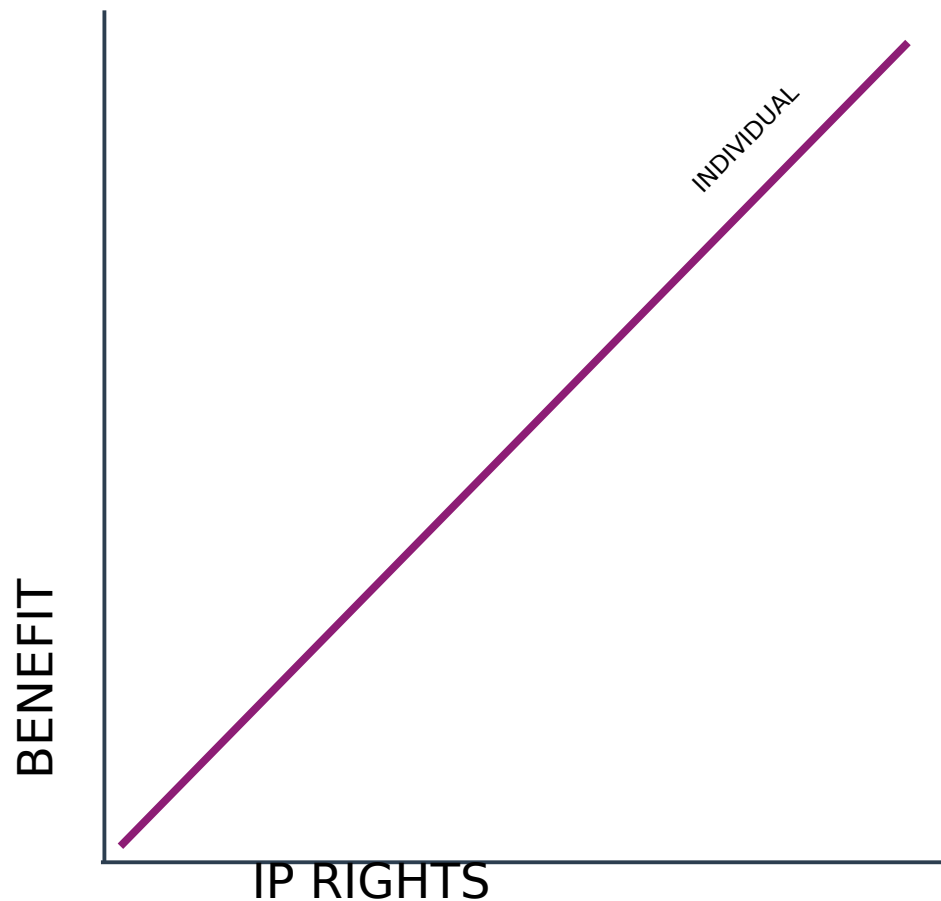
Intellectual Property Protection

- Balance the needs of individuals and society



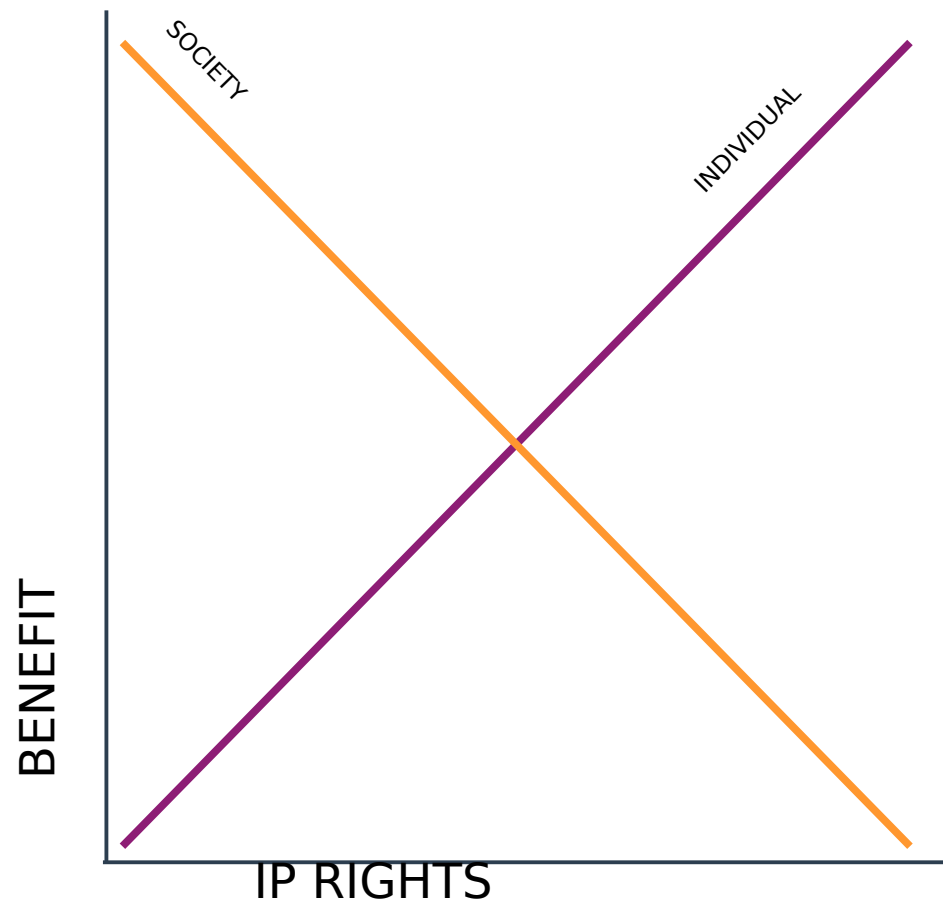
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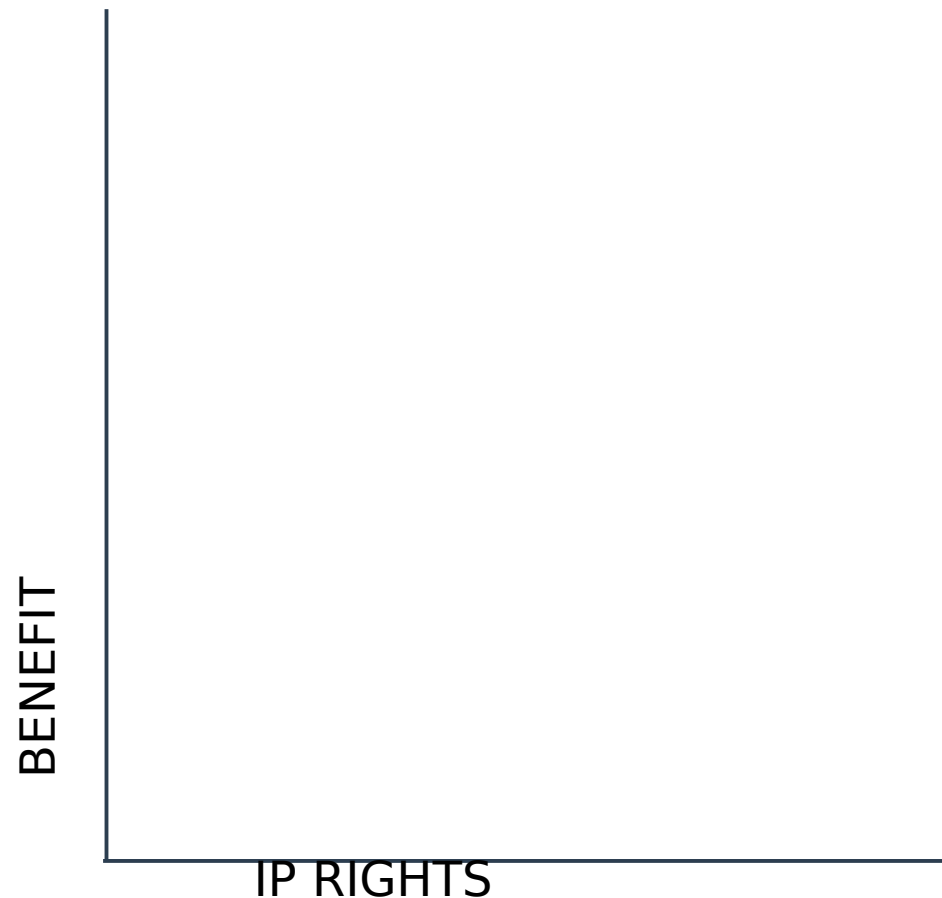
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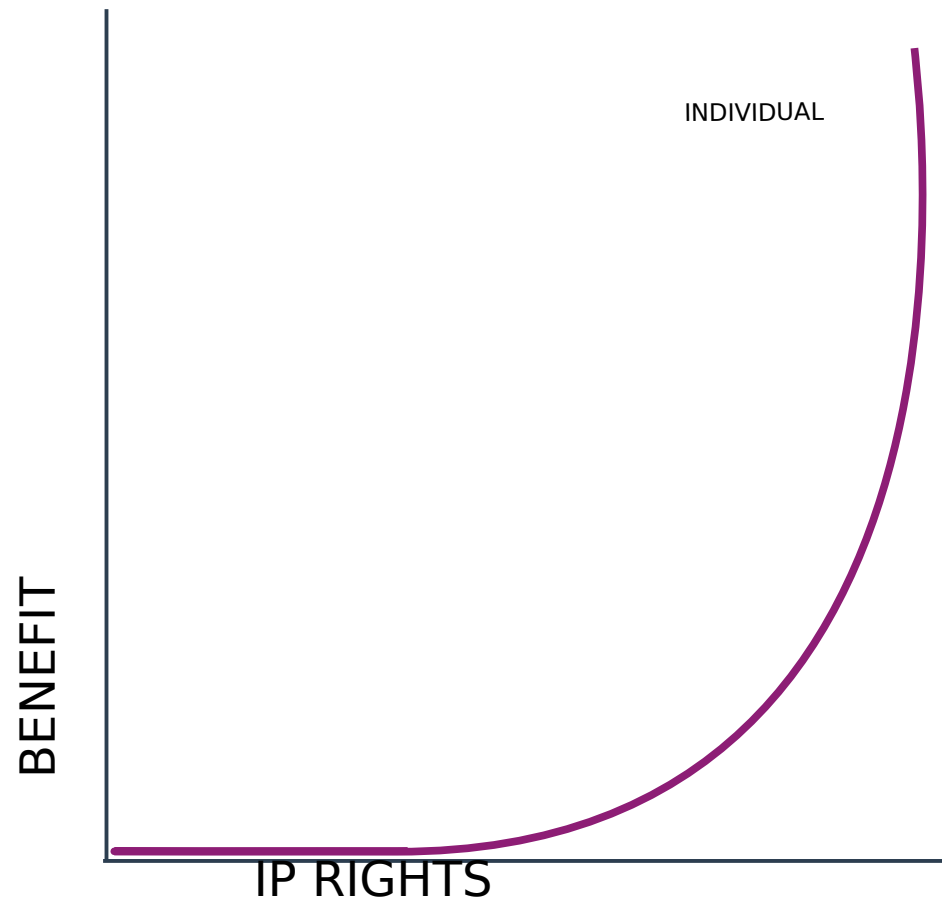
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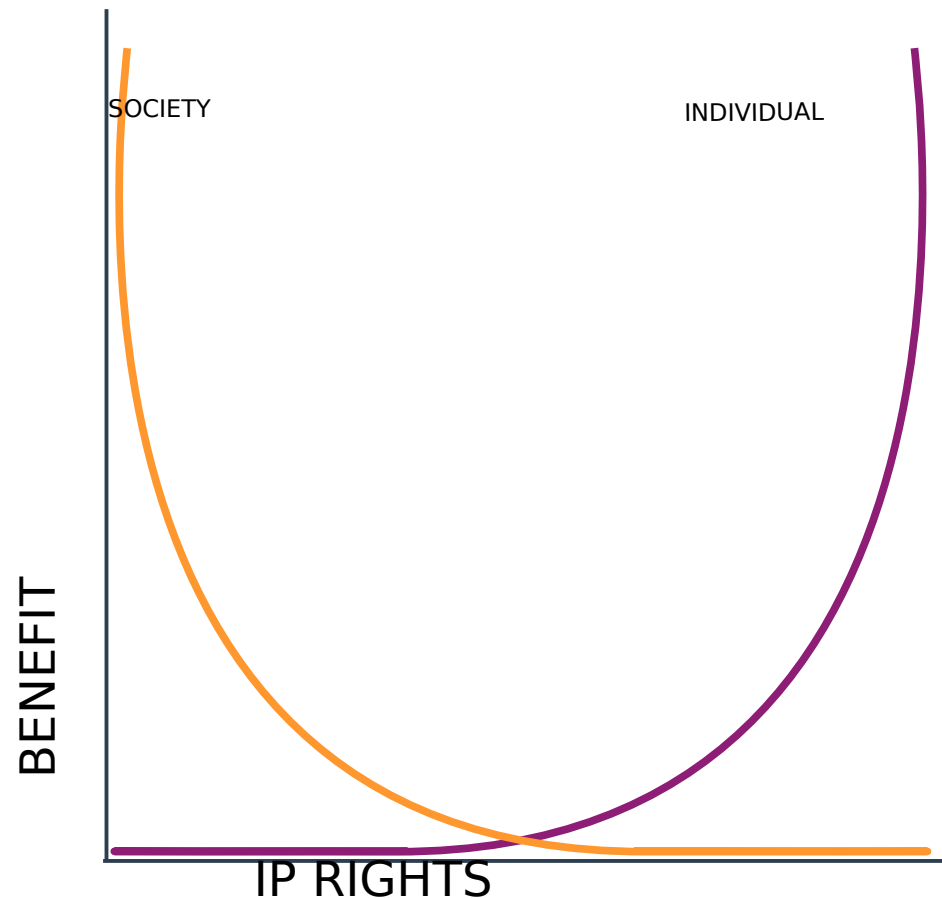
Intellectual Property Protection

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Intellectual Property Protection

- Balance the needs of individuals and society



Intellectual Property Protection

- Founders recognized benefits to **limited** intellectual property protection
- US Congress has struck compromise by giving creators rights for a **limited** time

Digital Ideas

- Effortless reproduction
- Trivial to distribute worldwide
- Copies indistinguishable from original



The unauthorized reproduction or distribution of this copyrighted work is illegal. Criminal copyright infringement is investigated by federal law enforcement agencies and is punishable by up to 5 years in prison and a fine of \$250,000.

IP Protections

- Trade Secret
 - Confidential IP that gives company a competitive advantage
 - Never expires
 - Not appropriate for all IP
 - Reverse engineering allowed
 - May be compromised when employees leave

IP Protections

- Copyrights

©opyright

- Patents



PATENT PENDING

- Trademarks

TM



Patents

- Protect systems or functional ideas
- Must be useful
- Must be new
- Must be inventive

US6360693B1

Animal toy

Abstract

An apparatus for use as a toy by an animal, for example a dog, to either fetch carry or chew includes a main section with at least one protrusion extending therefrom that resembles a branch in appearance.

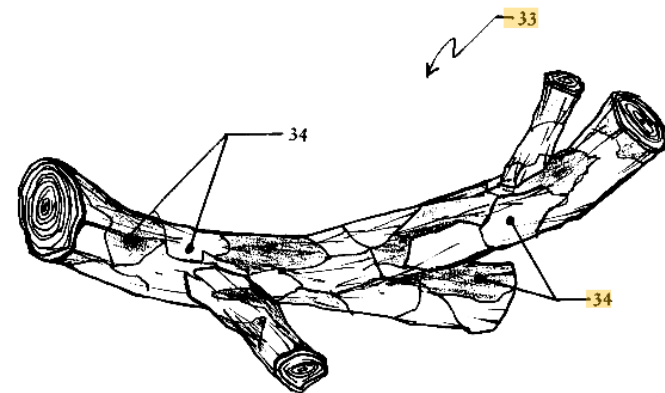
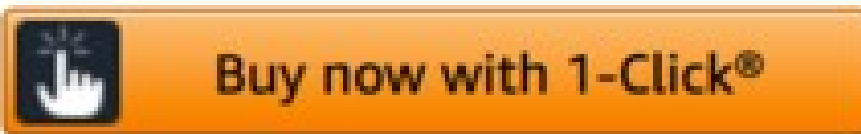


Figure 3

U.S. Patent Mar. 26, 2002 Sheet 3 of 3 US 6,360,693 B1



or 1-Click Checkout



Patents

- Patents provide copy protection for functional ideas
- Patent applications are arduous
- Provisional patents stake initial claim
- Patent portfolios add value to companies
- Applications for software patents have flooded the patent process

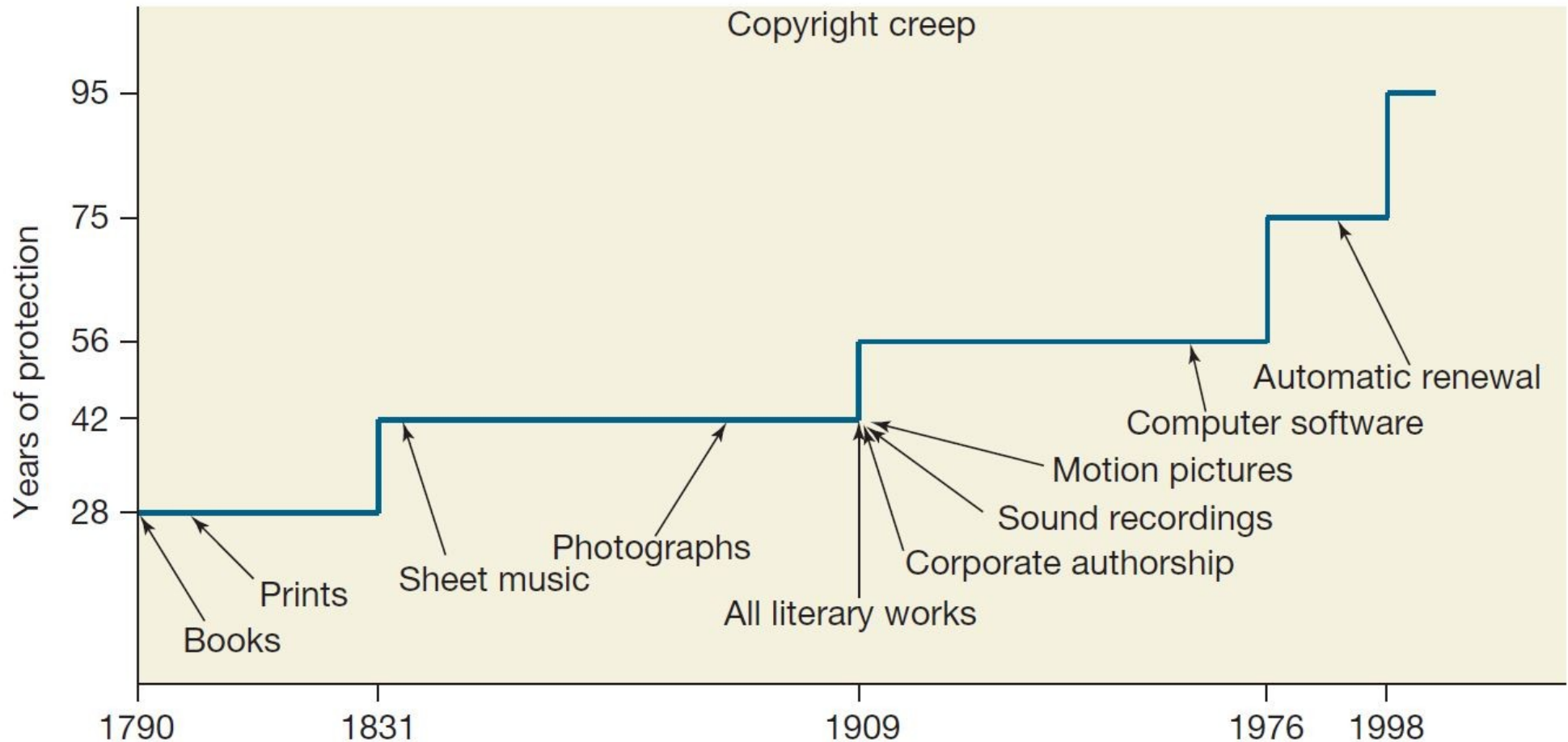
Copyright

- Provides creators with rights:
 - Reproduction (copy)
 - Distribution
 - Public display
 - Public performance
 - Production of derivative works
- Represents 6% of US GDP (>\$900 billion/yr)
- Expanded greatly since 1790

Key Copyright Court Legislation

- Gershwin Publishing v. Columbia Artists
 - Columbia Artists Management Inc. held liable for copyright infringements of community concert associations it supported
- Davey Jones Locker
 - Richard Kenadek found guilty of violating copyrights of owners of software he posted on a computer bulletin board system
- No Electronic Theft Act
 - Made it a criminal offense to reproduce or distribute more than \$1,000 worth of copyrighted material in a six-month period

Copyright Creep



Since the first Copyright Act was passed in 1790, both the length of copyright protection and the kinds of intellectual property that can be copyrighted have grown dramatically.

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

Case Study: Database Guru

- Rajiv employed at Felicity Software
- Signed a confidentiality and proprietary rights agreement
- Developed some database optimizations
- Moved to Unrelated.com, supervises team developing database software
- Realizes his optimizations would help team at Unrelated.com

Two alternatives for Rajiv

- “Clean room” strategy
 - Provide team with publicly available information
 - Provide team with performance targets
- Become personally involved
 - Ask team open-ended questions
 - Allow them to rediscover the optimizations he made at Felicity

Kantian Analysis

- “Clean room” option
 - Rajiv does not violate agreement he signed
 - “You can share your expertise with others” is a rule that can be universalized
 - Morally right
- “Personally involved” option
 - If he does not ask leading questions, O K
 - If he asks leading questions, he is disclosing information and violating agreement he signed
 - Breaking a contract = breaking a promise → wrong
 - Is it reasonable to think he can avoid asking leading questions?

Social Contract Theory Analysis

- Similar to Kantian analysis
- “Clean room” option
 - Rajiv helps team without violating an agreement
 - This is OK
- “Personally involved” option
 - If he can avoid disclosing information, OK
 - If he gets impatient and discloses information, not OK

Act Utilitarian Analysis

- Quantify consequences of each option in dollars
- Time horizon: 5 years
- Affected parties
 - Rajiv: Income over next five years
 - Unrelated.com
 - Lost income due to delay in releasing product
 - Expected costs associated with potential litigation

Act Utilitarian Analysis

- “Clean room” option
- Consequences for Rajiv
 - Expects 10% raise, worth \$15,000
 - Total worth \$75,000 over five years
- Unrelated.com
 - Six month delay costs the company six months’ revenue from its steady state
 - $50,000 \text{ customers} \times \$10/\text{month/customer} \times 6 \text{ months} = \$3,000,000$
 - No risk of litigation

Act Utilitarian Analysis

- “Ask right questions” option
- Unrelated.com
 - Three month delay costs the company six months’ revenue from its steady state, or \$1,500,000
 - Litigation risk 6.25% and cost \$5,000,000, so expected loss $\$5,000,000 \times .0625 = \$312,500$
- Rajiv
 - If no litigation, 15% raise, worth \$112,500 over 5 years
 - If litigation, get fired, lose \$750,000 over 5 years
 - Expected outcome: $.9375 \times \$112,500 - .0625 \times \$750,000 = \$58,594$

Act Utilitarian Analysis

Blank	Course of Action	
	Set up clean room	Ask team “right questions”
Affected parties		
Rajiv	\$75,000	\$58,594
Unrelated.com	Blank	Blank
Lost income due to delay in product release	(\$3,000,000)	(\$1,500,000)
Litigation risk	\$0	(\$312,500)
Overall benefit	(\$2,925,000)	(\$1,753,906)
		Better

Virtue Ethics Analysis

- “Clean room” option
 - Gives team opportunity to create a system that meets performance requirements
 - Rajiv shares expertise, insists performance goals get met, characteristic of a good engineer and manager
- “Personally involved” option
 - Working hard and sharing expertise are characteristic of good managers
 - Runs risk of violating confidentiality agreement, which is dishonest and not characteristic of good managers
- Prudent choice is “clean room” option

Conclusion

- “Clean room” option better option according to Kantianism, social contract theory, and virtue ethics
- “Personally involved” option better according to act utilitarianism, though a more risk-averse analysis would have resulted in “clean room” option being preferred

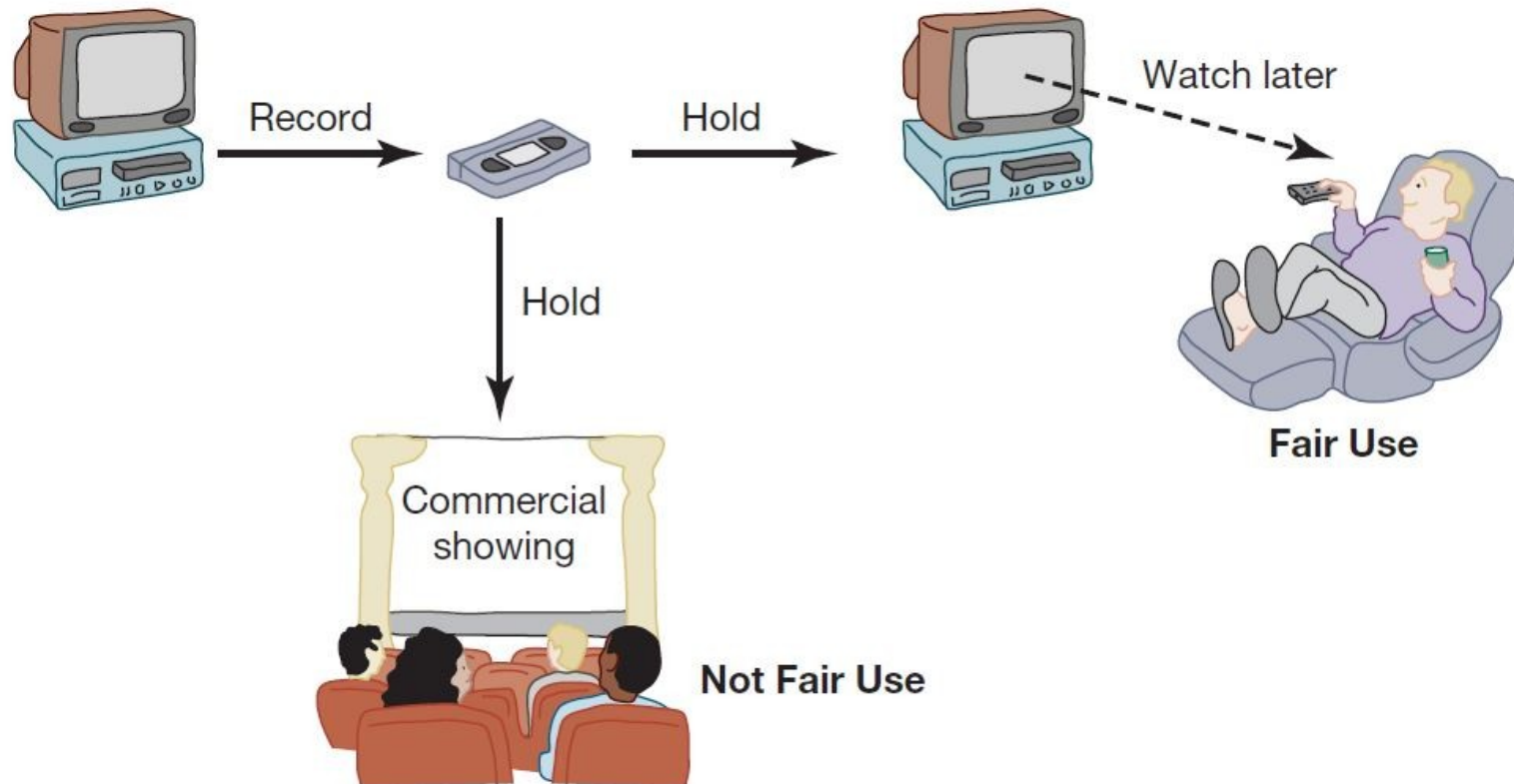
Fair Use

- Sometimes legal to reproduce a copyrighted work without permission
- Those circumstances called fair use
- To judge fair use, courts consider four factors
 - Purpose and character of use
 - Nature of work
 - Amount of work being copied
 - Affect on market for work

Fair Use - Time Shifting

- Sony v. Universal City Studios
 - Sony introduced Betamax V C R (1975)
 - People started time shifting T V shows
 - Movie studios sued Sony for copyright infringements
 - U.S. Supreme Court ruled (5-4) that time shifting is fair use

Time Shifting



The Supreme Court ruled that videotaping television broadcasts for private viewing at a later time is fair use of the copyrighted material. This practice is called time shifting. Using videotaped material for a commercial purpose is not considered fair use.

Digital Recording Technology

- Copying from vinyl records to cassette tapes introduced hiss and distortions
- Introduction of compact disc a boon for music industry
- Cheaper to produce than vinyl records
- Higher quality
- Higher price => higher profits
- But it's possible to make a perfect copy of a CD

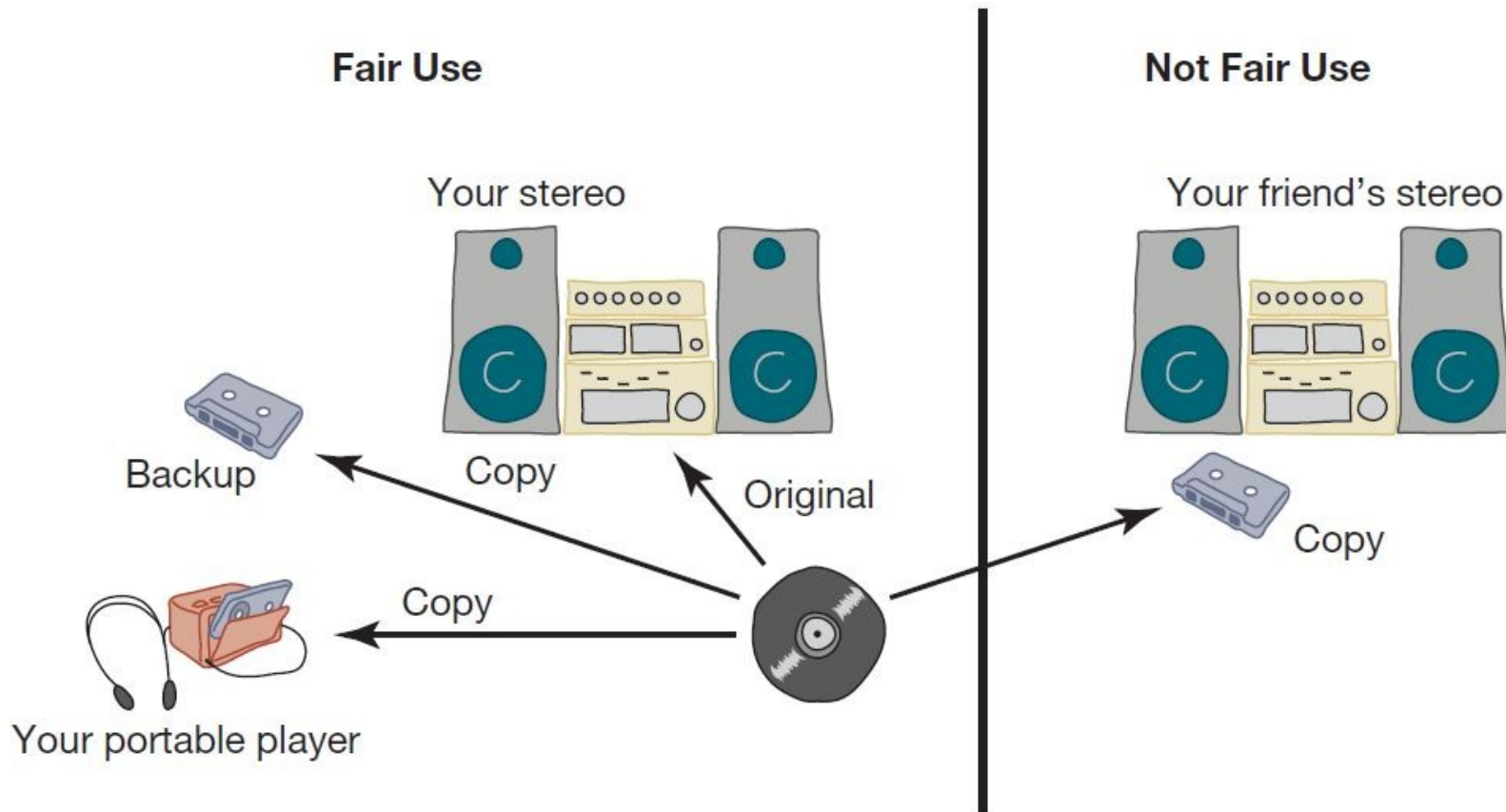
Audio Home Recording Act of 1992

- Protects rights of consumers to make copies of analog or digital recordings for personal, noncommercial use
 - Backup copy
 - Give to family member
- Digital audio recorders must incorporate Serial Copyright Management System (SCMS), so consumers can't make a copy of a copy

RIAA v. Diamond Multimedia

- MP3 compression allowed songs to be stored in 10% of the space, with little degradation
- Diamond introduced Rio MP3 player (1998)
- People started space shifting their music
- RIAA started legal action against Diamond for violation of the Audio Home Recording Act
- U.S. Court of Appeals, 9th Circuit, affirmed that space shifting is consistent with copyright law

Space Shifting



Space shifting is the creation of a copy for backup purposes or for use in a portable device, and it is considered fair use. Making a copy for a friend is not considered fair use.

Kelly v. Arriba Soft

- Kelly: photographer who maintained Web site with copyrighted photos
- Arriba Soft: created search engine that returned thumbnail images
- Kelly sued Arriba Soft for copyright infringement
- U.S. Court of Appeals, 9th Circuit, affirmed that Arriba Soft's use of Kelly's images was "significantly transformative" and fair use

Authors Guild v. Google

- Google announced plan to scan millions of books held by several huge libraries, creating searchable database of all words
- If public domain book, system returns PDF
- If under copyright, user can see a few sentences; system provides links to libraries and online booksellers
- Authors Guild and publishers sued Google for copyright infringement (copying books for commercial reasons)
- Judge ruled in favor of Google and dismissed lawsuit

Authors Guild v. Google

- Judge: Google Books is a fair use of copyrighted works
- Purpose and character:
 - Purpose is to create a massive index
 - Character is highly transformative
 - Precedent: Kelly v. Arriba Soft Corporation
 - Weighs in favor of fair use
- Nature of work being scanned: mostly nonfiction
 - Weighs in favor of fair use
- How much being scanned: entire work
 - Weighs against fair use
- Effect on the market: stimulating book sales
 - Weighs in favor of fair use

Mashups

- A versus B: instrumental track from one song + vocal track from another song
- Audio collage: create new composition from dozens of audio fragments
- Fair use? Lae suggests...
 - Audio collage: yes, because it is highly transformative
 - A versus B: no, unless “criticism, satire, or parody”

Summary

- IP laws protect the right to control inventions and artistic expression
- Copyrights and Patents protect software technology
- Copyrights protect form and patents protect function