Social Implications of a Computerized Society

Chapter 4

Intellectual Property
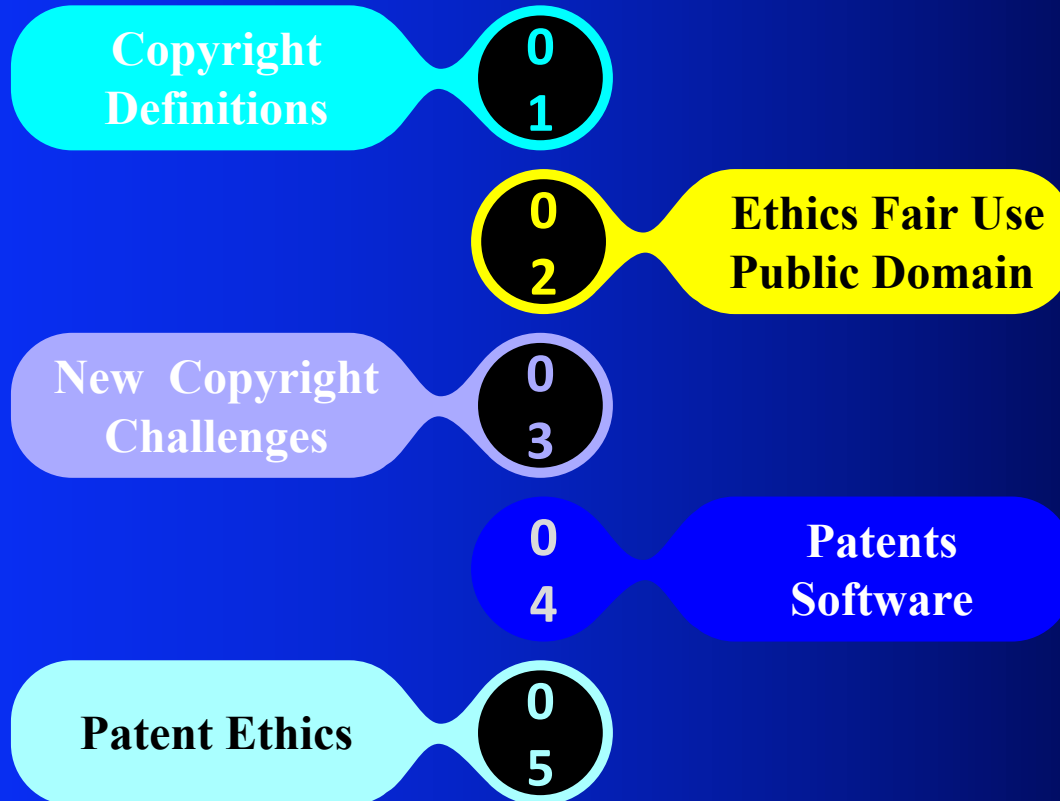
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Outline

- Intellectural Property Protection
  - Copyright
  - Patents
- Important for software/IT industry
- Traditional Views and Issues: copyright vs. fair use
- New Issues: Copyright infringement as a mass phenomenon.
- Do Software patents promote innovation?

Lecture Plan

Copyright Definitions — 01

02 — **Ethics Fair Use Public Domain**

New Copyright Challenges — 03

04 — **Patents Software**

Patent Ethics — 05

Key Concepts

- Copyright
- Creative Expression
- Fair Use
- Public Domain
- Patent for ideas, processes, devices
- Obviousness test
- Open Source Software

Survey Question

- Who has downloaded music/movie in the last week?

- Did you infringe copyright? Do you see an ethical problem?

- See canvas survey "Copyright"

Basic Concepts

Copyright and patents

What is copyrighted?

- **Creative works** and **creative expression** are protected by copyright.
- Creator acquires a form of **intellectual property**.
- Intellectual property, unlike physical property, is easily copied, hence need for special protection.
- Copyright applies to: Books, articles, plays, songs, art, movies, software.

What Copyright gets you

- **Exclusive right** to
  - Make copies of the work
  - Produce derivative work, e.g translation (fan fiction?)
  - Distribute copies
  - Perform work in public
  - Display work (e.g., video on website)
- **Exception**: Fair use - more later
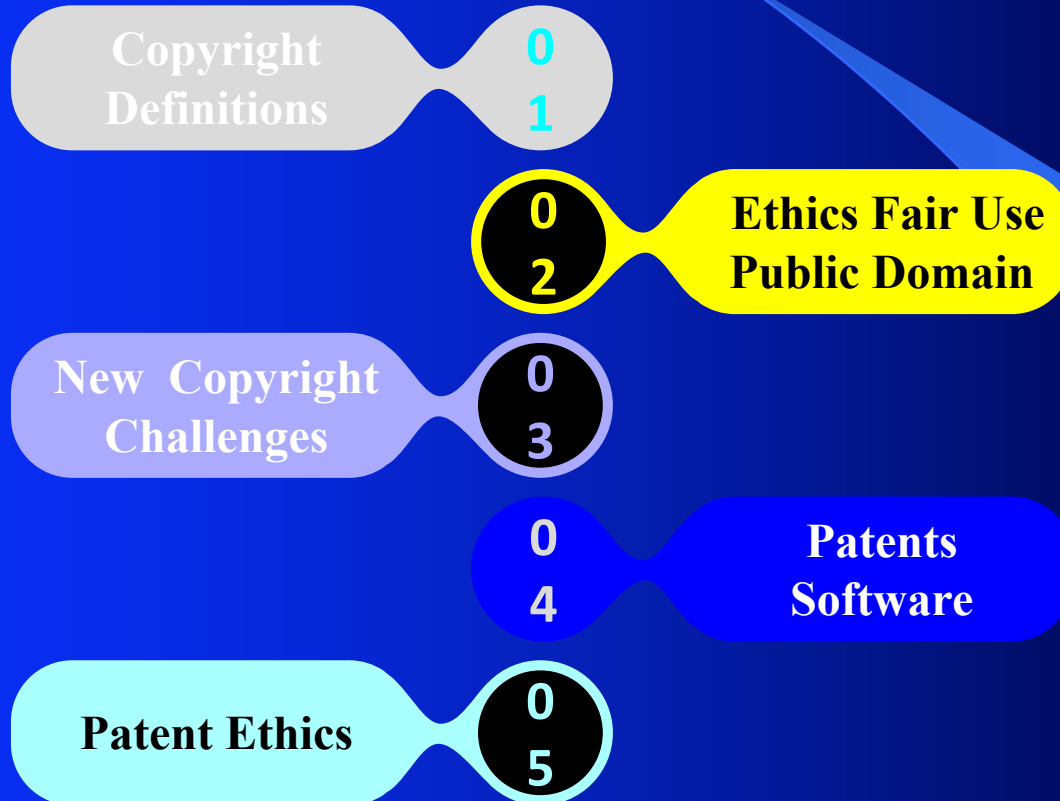
Important Features of Copyright

- No need to apply for it (contrast with patent).

- Protects the creative work, not the physical copy. Difference with physical property right (e.g., car).

- Copyright expires, then work enters **public domain**. (With movies, US Congress keeps extending the timeline, now up to 95 years).

What is not protected by copyright

- Facts
- Concepts
- Processes (including algorithms)
- Methods of Operation
- Ideas
- The **expression** of an idea is protected, but not the idea itself. Boundary can be unclear - software programs?!

➢ Reimplementations, reverse engineering is okay.

Patents

- Protects **ideas** as embedded in devices and processes.
- Need to apply for patent protection.
- Idea cannot be **obvious** or already known.
- Inventor has monopoly on using the idea for a specified amount of time.

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Ethics and Intellectual property

Ethics of Copyright: Liberty/Rights Perspective

- Copyright: the right to copy art/writing/**expressions of ideas.**

- Copyright/patent is mainly a **positive/claim** right to use of intellectual property.

- 3rd-person implications: prevent others from using your creation/invention.

- But the owner of a copy of a creation (e.g., song on CD) has a property right in her physical copy. This is a negative liberty to use her property as she sees fit (e.g., share the CD with friends).

- So copyright is balanced by **fair use** exceptions.

Ethics of Copyright: Universalizability

- **Key question: what if everybody downloaded?**

- Seems to be argument against downloading: creators would not make money.

- Or would they?

Ethics of Copyright: Utilitarian Perspective

- Promote <u>innovation</u>, and so social benefit, by allowing the creator to benefit from his creation.
- Promote social benefits by entering creation into <u>public domain</u>.
- Trade-off expressed in copyright length
- In 1790: U.S. copyright was for 14 years.
- The <u>Berne convention</u> stipulates life of author + 50 years.
- Economists: <u>15-28 years is optimal</u>.

Utilitarian Analysis of Copyright Length

Creator
↓

Options					Community
30 years	50	20	20	20	110
70 years	80	5	5	5	95

Fair Use of Copyrighted Material

- Typical Examples: criticism, comment, parody, news reporting, teaching, scholarship, research.
- Four factor test:
  - Purpose: for profit or educational.
  - Nature of work: fiction vs. factual report.
  - Amount and significance (e.g. > 30%).
  - Effect on potential market or value of work (e.g., depressing CD sales vs. home use).

Discussion Questions on Fair Use

Which of the following constitute fair use of video files in your opinion?

- Burning a CD for a friend.
- Making the music available on a peer to peer network (frostwire, bittorrent).
- Moving the file from one of your computers to the next, say from an Ipod.
- Posting the file on the internet for downloading.
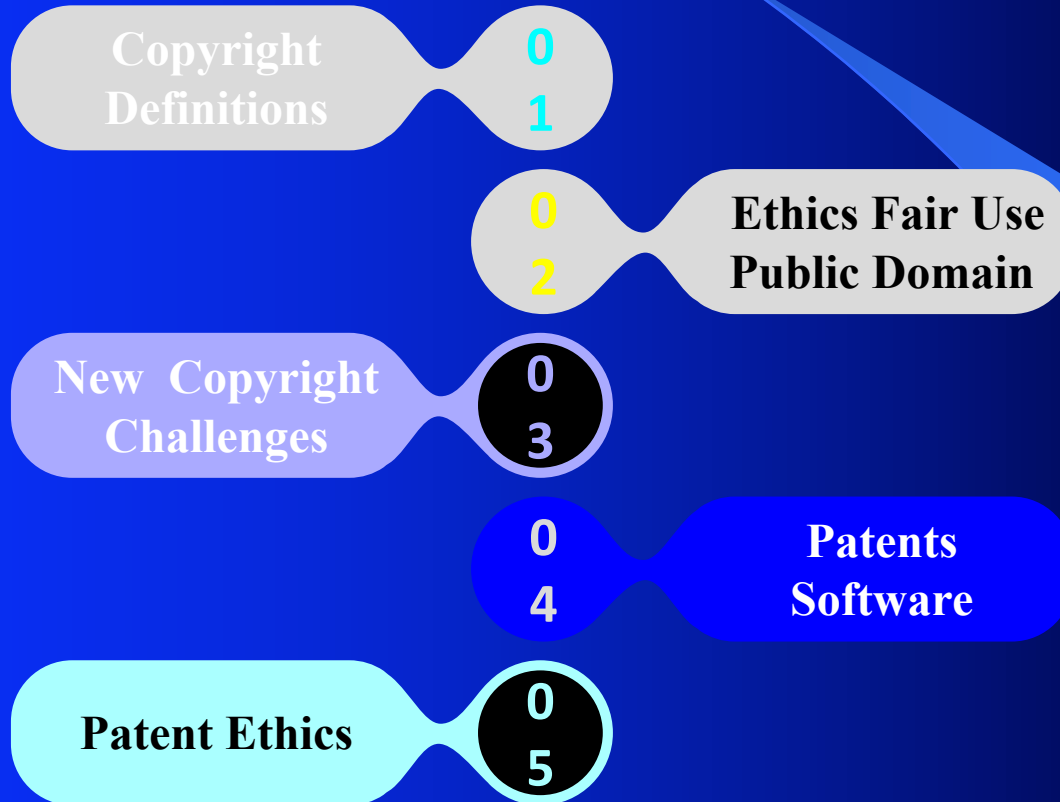
Discussion Question

- Fan fiction is derivative fiction based on the characters in the original novel.

- More than 40,000 Harry Potter stories on the web.

- Is fan fiction fair use? Apply the four factors.

International Issues

- Many countries do not have legal protection for intellectual property or do not enforce it, e.g. China.

- One argument against international enforcement is from a global justice/developmental perspective (e.g., Stieglitz, "Making Globalization Work").

    – Copyright/patent holders usually in industrialized world---developing countries too poor to pay.

    – Developing countries needs ideas in the public domain to develop.

Discussion Question

- The HIV prevalence in sub-Saharan Africa is estimated at 24 million cases.

- Generic drugs could cure or keep alive many people, but Western pharmaceuticals oppose relaxing patent protection for African patients.

- Do you think that Africans should be able to use generic versions of Aids drugs? What are the pros and cons?

- How about generic versions of Corona vaccines?

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Copyright Definitions — **0 1**

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Patent Ethics — **0 5**

Copyright Enforcement

New challenges

New Challenges from Technology

- Digital technology enables high-quality, high-quantity copying (vs. photocopiers)
- Scanners, compression of music/audio files.
- Web makes distributing and transferring digital content easy (torrents)
- Easy to adapt works of others (photoshop, vidding).

Copyright Infringement as a Mass Phenomeon

- Traditionally copyright is a B2B issue, because mass copying required equipment.

- For digital content, downloading and using intellectual property has become a mass issue.

- 90,000 members in Facebook group "Fair Copyright for Canada".

Copyright Enforcement: Technological Approach

- For Software: Activation numbers, expiration dates, copy protection.

- Largely dropped because customers dislike it.

- Compare: reselling a (text)book vs. selling a software copy.

- Fake copies (decoys, honeypots) or music copies with ads (Coke).

Copyright Enforcement: Suing and Taxing

- Sue ISPs whose subscribers operate file-sharing, sue university students.

- Sue against new technology: CD burners delayed since 1988, Tivo, DVD players that can copy movies.

- Taxing: levies on blank CDs, Ipods, PCs, printers,… (in EU, Canada,U.S.).

Copyright and New Technology: Did Video kill a movie star?

Movie Studios vs. Sony: sued Sony for making betamax video cassettes. Supreme Court found in favour of Sony.

- private, noncommercial use usually fair.

- Recall general principle: a device with substantial legal uses should not be penalized because some people use it to break copyright.

Copyright Enforcement: Market Approach

- BMI, copyright clearance centre, CanCopy: represent groups of copyright holders, charge users one fee for everything.

- Advertising (e.g., the new Napster).

- Website (e.g., YouTube pays company (e.g., Warner Brothers) when some of its material appears in a post.

Are internet companies liable for copyright infringement?

- Do Internet Service Providers or Search Engines have a duty to monitor their users/queries and block download websites?

- Do they have a duty to block download sites when notified of the copyright infringement? What sort of "notification" should be required?

- Similar to general issues around illegal content (e.g. hate speech).

The Great EU debate: updating copyright laws

- European parliament <u>backed copyright draft law</u> on Sep 12, 2018. See also <u>here</u>

- Requires upload filters: Youtube, Facebook etc. would have to run determine whether content they are hosting contains copyright material <u>before</u> uploading.

Content Creators vs. Web Companies

- "We're witnessing a vast redistribution of wealth from the creative sector to the tech sector, not only with books, but across the spectrum of the arts".
Roxana Robinson, Authors Guild president

- "This [EU legislation] would effectively turn the internet into a place where everything uploaded to the web must be cleared by lawyers before it can find an audience"
Caroline Atkinson, Google VP global policy.

- Discuss the copyright dispute from different ethical perspectives: a) utilitarian b) rights-based c) distributive fairness
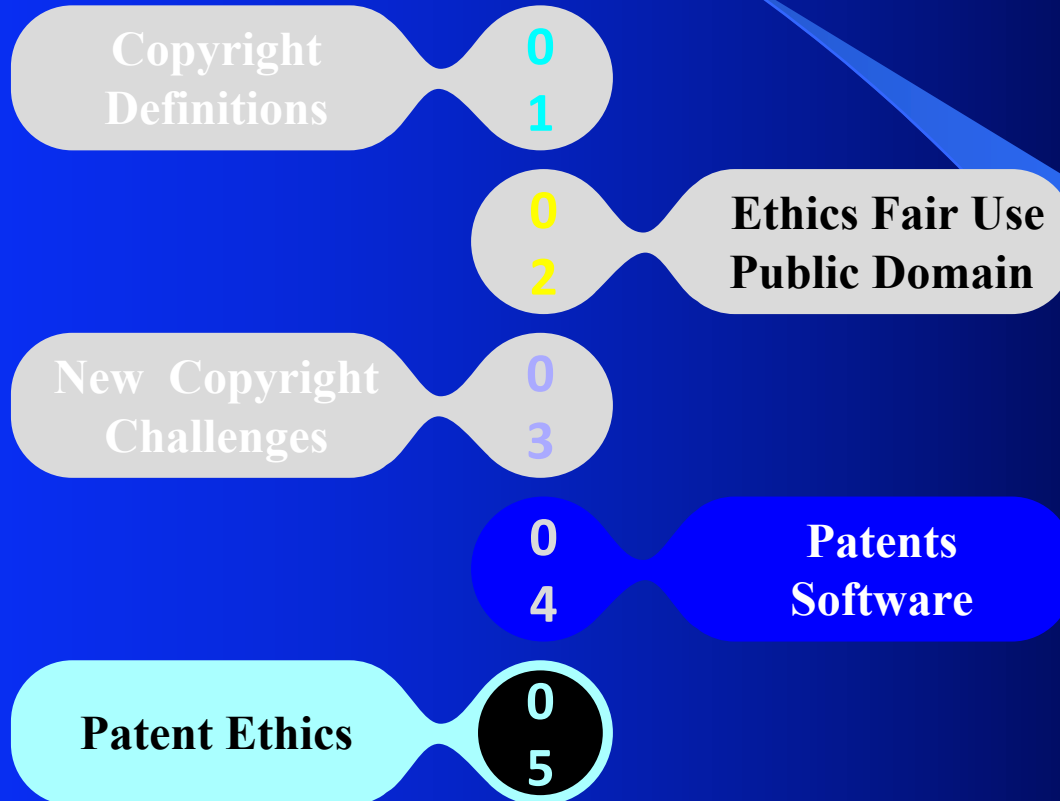
Search and Revenue Sharing

- Facebook and Google get many eyeballs by connecting users to news items published by news papers.

- The "link tax" says that platforms must pay newspapers to show snippets of their content.

  – Compare news.google.ca and news.google.es

  – Australia introduced a revenue sharing regime in 2021.

  – Canada is still thinking about it

Streaming and Revenue Sharing

- Streaming Models (Netflix, Spotify).
  - Music Industry Revenue is up but diminished
  - Free fall stopped by streaming
- Artist's income is generally down due to the loss of CD, concert sales

Discussion Question

- What do you think is the best approach to support content creators?
  - Upload filters?
  - Revenue sharing?
- Consider approaches via the legal system, taxation, markets and technology.

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Patents, Software and Intellectual property

Software Copyright

- Difficult to define copyright exactly.
- Outright copying violates copyright.
- So does "translating" into another programming language.
- But reimplementing the basic idea of the program---the algorithm---does not.
- Compare with cooking recipe.
- "Look and feel" is not copyrighted. MS Windows can copy ideas from Mac GUI.

Patents

- "Whoever invents or discovers any new and useful process, machine, manufactures, or composition of matter, ... may obtain a patent therefor..." U.S. Patent Law

- Patents protect the **use** of an idea.

- Copyright the **expression** of an idea.

Patent Principles

- Users of a patented invention or process must get authorization from patent holder.

- Laws of nature and mathematics cannot be patented.

- Should not be obvious:
  "patents should strike a balance between protecting inventors and not granting monopolies over procedures that others would discovery by independent, creative application of general principles" Supreme Court

Software Patents

- Software can generally be patented.
  - current estimates: about 65,000 patents/year.
  - encryption, compression, one-click shopping, copy protection, pop-up ads, privacy controls
- Examples:
  - Amazon holds patent for 1-click shopping. (Is that an obvious idea?)
  - Alcatel-Lucent holds MP3 patents.
  - Blackberry was sued for patent infringement.
  - "A smartphone might involve as many as 250,000 (largely questionable) patent claims." David Drummond, Chief Legal Office of Google

Are Software Patents a Good Thing?

The Main Issue (utilitarian): Do they Promote or Prevent Innovation?

- Pro: Reward Inventors, make companies willing to market invention.
- Con:
  - Software systems combine many small ideas---patents stifle new innovations.
  - New programs must worry about being sued---hard to keep track of all patents, unclear legal situation.
  - Similar issue with Copyright, see Blurred Lines case

Legal Problems With Patents

- <u>Patent trolls</u> buy patents.

- They do not use the patents, but sue other companies for infringement.

- ➢ <u>Large companies buy patents to create a defensive arsenal.</u>

- e.g. Google bid billions on Nortel patents to "create a disincentive for others to sue Google" for Android development.

Proprietary Software = Bad Software?

- Companies often develop software in a rush, with a minimum of effort, to gain customers before they put in more effort.

- Later try to fix problems, but hard to build on a bad foundation---"legacy code".

- B2B: Clients become dependent on system providers---SFU and SIMS?

Open Source Movement

- Free Software Movement.
- Copyleft: people can use, modify, distribute, but only if the same applies to their produccts.
- Creative Commons: new kinds of licences.
- Examples: Linux, Firefox, Apache.

Discussion Question

Do you think all software should be free? What are the pros and cons? Are there some types of software that should be free or proprietary?

Free Software

- Pros:
  - Better quality ?
  - Promotes use in innovative applications.
- Cons:
  - Would there be enough incentive to develop programs?
  - Who provides technical support?
- Some businesses embrace open source.
  - Sun: GPL license for Java.
  - IBM: promotes Linux.

conclusion

Copyright and Digital Technology

- Copyright: the right to make copies of a physical embodiment of a creative work

- Copyright length is limited

- Digital technology vastly increases the scale of how many people can copy how much:

  – large capacity storage devices, automated copying

  – distribute via the internet

Reactions to Mass Copying

- Legal: threatening law suits against
  - ISPs
  - users
  - internet platforms
- technical: filters, decoys, honeypots
- new business models, e.g. streaming

Patents

- Protect (the use of) an idea
- Much software can be and has been patented
- + Encourages new development via profits
- – Discourages new development for fear of infringement
- – discourages sharing
- – patent trolls take advantage to sue without creating or using technology
- possible response: free software movement, open source, copyleft