

# Computer Ethics

## Integrating Across the Curriculum

# Intellectual Property



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# Definitions

- Intellectual property is ownership of nonphysical items (i.e., creations of the mind).<sup>10</sup>
- Legal rights are associated with intellectual property.
  - Designer rights
  - Lending rights
  - Software rights
  - These rights are traditionally covered by
    - Patent law
    - Trademark law
    - Copyright law<sup>3</sup>



# Protection of Intellectual Property

- Patent
- Trademark
- Copyright
- Trade secret



# Definitions (continued)

- Patent—Government-issued right to inventor giving exclusive rights to invention for limited period of time, usually 20 years
- Trademark—unique name, symbol, and so forth associated with a product, service, or firm whose associations has been legally registered.<sup>10</sup>



# Definitions (continued)

- Copyright—rights that protect the use and sale of an idea or expression, or a literary or creative work<sup>10</sup>
- Trade secret—information used by a business or corporation not generally known and wished to be kept secret<sup>3</sup>



# Patent

- Getting a patent
  - Apply at Patent and Trademark Office
  - Describe invention in detail
  - If more than one person applies, patent given to one who proves had main idea first (not first to file)
- Eligibility for a patent
  - No abstract concepts
  - Invention satisfies qualities of
    - Utility
    - Originality
    - Nonobviousness<sup>10</sup>



# Phrases Associated with Patents

- Patent Pending—period of time after application filed and waiting for patent
  - No legal rights at this time
- Infringement—use of patented invention without permission from patent holder<sup>10</sup>



# Patents (continued)

- What does having a patent mean?
  - A patent holder can grant rights of use to others.
  - Patented invention needs to be marked with a patent number and the word “patent.”
  - After the patent expires, the invention enters the public domain.<sup>10</sup>
- Violation of a patent
  - Communicate with person(s) using invention and ask them to desist
  - Can file suit in federal district court<sup>3</sup>



# Trademark

- Getting a trademark
  - Also called mark or service mark
  - Apply at the US Patent and Trademark Office
  - Get registration certificate
  - Marks appear in the Official Gazette<sup>10</sup>
- Eligibility for a trademark
  - Intensive search to guarantee mark does not belong to another<sup>3</sup>



# Trademarks (continued)

- What does having a trademark mean?
  - Legal right to use mark to identify a source of product or service
  - Use as a marketing tool for public identification<sup>10</sup>
- Violation of a trademark
  - Asked to desist using the mark
  - Infringement action (legal recourse) against person, organization, or business<sup>3</sup>



# Copyright

- Protects the form of an idea but not the idea itself
  - Copyright law restricts the use of digitally recorded information (e.g., programs, data).
  - No formalities are necessary to get copyrights, but it is a good idea to obtain one through the US Copyright Office.<sup>1</sup>



# Copyright (continued)

- Getting a copyright
  - Not necessary, but good idea to register at Copyright Office in case of infringement
  - “Poor Man’s Copyright”—creator sends work to himself via registered mail in sealed envelope, where the postmark establishes the date; not substitution for actual registration
  - “Do It Yourself Copyright”—write ©, year of publication, and creator’s name on work
- Eligibility for a copyright
  - Work must be original, not necessarily unique
  - Two authors own copyright on substantially identical works, if duplication coincidental, and neither copied<sup>1</sup>



# Copyright (continued)

- What does having a copyright mean?
  - Gives creator of original work complete rights for specific time period
  - Cannot be copied without permission
  - Copyright holder must be credited for work
  - Who can adapt work
  - Who can gain financially from it<sup>1</sup>
- Violation of copyright
  - Need to show valid copyright
  - Need to prove work copied
  - Legal action usually in civil law court<sup>3</sup>



# Copyright: An exclusive right to:

- *reproduce* the work in copies or phonorecords;
- prepare *derivative works* based upon the work;
- *distribute copies or phonorecords* of the work to the public by sale or other transfer of ownership, or by rental, lease, or lending;
- *display the copyrighted work publicly*, in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work; and
- In the case of *sound recordings*, to *perform the work publicly* by means of a *digital audio transmission*.



# Concept of Fair Use

- Codified in Copyright Act of 1976
  - Permits some copying and distribution without permission of the copyright holder or payment.
  - Does not explicitly define fair use.
  - Provides considerations to use for analysis factors to consider in a fair use analysis.
    - The reason for use (e.g., for education or personal profits)
    - The nature of the copyrighted work—factual work or artistic work
    - Amount of work used
    - Effect of the use upon market<sup>1</sup>



## Sec. 107. - Limitations on exclusive rights: Fair use

...the fair use of a copyrighted work ... for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work ... is a fair use the factors to be considered shall include -



# Fair Use: 1) What is the character of the use?

- Weighs toward:
  - Nonprofit
  - Educational
  - Personal
- “Core”, helpful if the above true:
  - Criticism
  - Commentary
  - News reporting
  - Parody
  - Otherwise "transformative" use
- Weighs against:
  - Commercial

This and following from

“Fair Use of Copyrighted Materials”, Georgia Harper

<http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm#test>



## Fair use: 2) What is the nature of the work?

- Weighs toward:
  - Fact
  - Published
- Somewhat supportive:
  - A mixture of fact and imaginative
- Weighs against:
  - Imaginative
  - Unpublished



## Fair Use: 3) How much of the work will you use?

- Weighs toward:
  - Small amount
  
- Weighs against:
  - More than a small amount



## Fair Use: 4) If widespread, commercial use?

- Weighs toward:
  - After evaluation of the first three factors, the proposed use is tipping towards fair use
- Somewhat supportive:
  - Original is out of print or otherwise unavailable
  - No ready market for permission
  - Copyright owner is unidentifiable
- Weighs against:
  - Competes with (takes away sales from) the original
  - Avoids payment for permission (royalties) in an established permissions market



## Fair Use: 4) <comments>

- This factor is a chameleon. Under some circumstances, it weighs more than all the others put together. Under other circumstances, it weighs nothing! It depends on what happened with the first three factors.
- Here's why:
- This factor asks, "If the use were widespread, would the copyright owner be losing money?" Well, actually, it asks, "If the use were widespread, *and the use were not fair*, would the copyright owner be losing money?" After all, if the use were fair, the copyright owner would not be entitled to any money at all, so he couldn't "lose" what he never would have had to begin with.



# Trade Secrets

- Information, algorithm, formula, and so forth not generally known that provides advantage over competition<sup>5</sup>
- Maintenance of secrecy
  - Do not reveal unnecessarily.
  - When necessary to share, articulate the secrecy of the shared information and emphasize the necessity of confidentiality.



# Protection of Trade Secrets

- Most states (except NY, MA, NJ, NC, and TX) passed the Uniform Trade Secrets Act (UTSA).
- In contrast with patents, copyrights and trademarks are a federal-based form of protection law.<sup>5</sup>
- Economic Espionage Act of 1996—theft of trade secret is federal crime.<sup>2</sup>



# Discovering Trade Secrets

- Reverse engineering
  - Working backward
  - Take something apart to learn how it works
  - Is this stealing a trade secret?
  - Usually considered legal
- Industrial espionage
  - Usually subject to legal repercussions
  - Employee leaving company takes skills, and information with him or her to next company
    - Hard to prove if violation of trade secret or not
  - Prevention—employee leaving company asked to sign agreement not to work in industry for specific time period<sup>9</sup>



# Historical Perspectives

- The US Constitution authorizes copyright legislation guaranteeing a period of time in which only the creator of the work can profit from it.
- The first US copyright law was passed in 1790.
- The Copyright Act of 1909 stated that copied work must be in readable form.<sup>3</sup>
- Laws did not specifically deal with computer software issues.<sup>7</sup>



# Software Issues

- Copyright issue—software similarity
  - Similar code
  - Similar interface
  - Similar performance
  - Similar algorithm
    - Usually thought to be ideas and thus not copyrightable
    - Yet, if study algorithm, can generate software
  - Requires interpretation, as copyright laws do not speak to software<sup>6,7</sup>



# Case Studies: Copyright

- *Franklin v. Apple*
- *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*
- *Krause v. Titleserv*
- *Lotus v. Borland*
- *Lotus v. Paperback Software & Mosaic Software*



# *Franklin v. Apple*

- Object code—output of a compiler in a machine-oriented language
- Question of whether object code is copyrightable since cannot be read by humans
- Apple proved Franklin copied the object code of its operating system.
- Supreme Court decision reflects that object code was a “copyrightable expression.”<sup>4</sup>



# *Whelan v. Jaslow*

- Whelan developed program for Jaslow's dental office.
- Jaslow wrote similar program in a different language for laptops.
- It was a different code but a similar algorithm.
- The Supreme Court sided with Whelan, recognizing that organization and structure are protectable by copyright.<sup>7</sup>



# *Krause v. Titleserv*

- Krause wrote programs for Titleserv and was paid by Titleserv.
- Krause owned the copyright.
- Titleserv modified programs and improved on them for themselves.
- They did not market or distribute them.
- The court found in favor of Titleserv.
- The court opinions favor software purchasers, users, and licensees over software developers and vendors.
- The court's ruling relied on the "no harm" principle.
  - No harm was done to Krause's enjoyment of his copyright.<sup>8</sup>



# *Lotus v. Paperback Software & Mosaic Software*

- Lotus sued Paperback Software & Mosaic Software in 1990.
- Two companies created spreadsheets with the same interface as Lotus 1-2-3.
- There was no issue of copying code.
- Lotus claimed that copying the interface was copyright infringement.
- Lotus won.
- The other two companies went out of business.<sup>7</sup>



# Lotus v. Borland

- There was an issue over the menu structure, the arrangements of commands.
- This occurred in 1992.
- The user interface was different.
- The district court sided with Lotus.
- Borland appealed the decision.
- The US First Circuit Court sided with Borland, reversing the earlier decision.
  - Borland argued that the two programs were not sufficiently similar.
  - The court held that the menu structures were similar but that the menu structure was not copyrightable.<sup>7</sup>



# Lotus v. Borland (continued)

- Lotus appealed to the Supreme Court.
  - Split decision
  - No affirmation nor rejection of issue in software copyrightability
  - Appeals court ruling stood by default
- General concern
  - Are user interfaces uncopyrightable?
  - The hope was that the Supreme Court would decide generic issues about software copyrightability.<sup>7</sup>



# Case Studies: Patents

- *In re Bradley*
- *In re Diehr*
- *In re Schrader*
- *Paine Webber v. Merrill Lynch*
- *State Street Bank v. Signature Financial*



# In *re* Bradley

- Outcome—first breach in traditional view that inventions relating to computer software is unpatentable
- Bradley data structure employed firmware programmed with microcode.
- The court described it as “a physical interconnected arrangement of hardware” and also referred to it as a machine.
- This occurred in 1979.
- The Court of Customs and Patent Appeals ruled that an invention relating to firmware is patentable.<sup>6</sup>



# *In re Diehr*

- Concerned computer-controlled process for curing rubber
- 1981
- Supreme Court held computer-related process to be patentable on the basis that a computer applies a mathematics formula to control a process and does not mean that formula itself is being patented.<sup>6</sup>



# In *re* Schrader

- The Court of Appeals for the Federal Circuit denied patent to Schrader's method for selling property or other items at auction using a procedure of bidding and deciding optimum prices.
- Schrader stated that it was beneficial but not necessary to use a computer.
- The basis of the court's decision was that Schrader was seeking to patent an algorithm.<sup>6</sup>



# *Paine Webber v. Merrill Lynch*

- This was concerned with the system of processing and supervising subscriber accounts.
- The Federal District Court of Delaware found the system patentable.
- The invention was claimed as a system, not a process.
  - This implies a requirement of use of hardware.
  - The court could not find any link to a procedure for solving a mathematical problem in the system (not trying to patent an algorithm).<sup>6</sup>



# State Street Bank v. Signature Financial

- Patent a computer data processing system for managing financial services configuration of a partnership portfolio
- Massachusetts District Court claimed it did not define patentable invention.
  - Claim was in essence an accounting system that could be achieved with pencil and paper and did not have enough “physical” activity.
- On appeal, the Federal Circuit Court of Appeals reversed the decision.
  - The time frame compelled the use of a computer.
  - The claim for patent was intended toward a machine as opposed to an algorithm.<sup>6</sup>



# Conclusions

- There are several legal means of protecting computer software.
- The laws were enacted before technology was integrated into everyday life.
- The laws do not specifically address the concerns of computer software.
- Many cases are going to court, and precedents are being set this way.
- Should the legislation be changed, or should we continue along case by case?



# References

1. United State Patent and Trademark Office. 2008. 3 July 2008 <<http://www.uspto.gov/#>>.
2. Field, Thomas, G., Jr. 2007. "Intellectual Property: The Practical and Legal Fundamentals." 2 July 2008 <<http://www.fplc.edu/tfield/plfip.htm>>.
3. Copyright. 2008. US Copyright Office. 3 July 2008 <<http://www.copyright.gov/>>.
4. Intellectual Property: Trade Secrets Center. 2008.FreeAdvice. 3 July 2008 <[http://law.freeadvice.com/intellectual\\_property/trade\\_secrets/](http://law.freeadvice.com/intellectual_property/trade_secrets/)>.
5. Dilworth, George. 2005. "The Economic Espionage Act of 1996." 3 July 2008 <[http://www.usdoj.gov/criminal/cybercrime/usamay2001\\_6.htm](http://www.usdoj.gov/criminal/cybercrime/usamay2001_6.htm)>.
6. Ulrich, Craig. 2001. "The Economic Espionage Act – Reverse Engineering and the Intellectual Property Public Policy." 3 July 2008 <[www.mttl.org/volseven/Uhrich.pdf](http://www.mttl.org/volseven/Uhrich.pdf)>.
7. Software and copyright law. 30 June 2008 <<http://www-swiss.ai.mit.edu/6805/articles/int-prop/software-copyright.html>>.
8. Ladas & Parry Guide to Statutory Protection for Computer Software in the United States. 30 June 2008 <<http://www/ladas.com/Patents/Computer/Patents.USA.html>>.
9. Hasset, Rob. 1983. "Impact of Apple vs. Franklin Decision." 3 July 2008 <<http://www.internetlegal.com/impactof.htm>>.
10. Supreme Court Denies Certiorari in Software Copyright Case. 30 June 2008 <<https://www.techlawjournal.com/topstories/2005/20051107.asp>>.



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