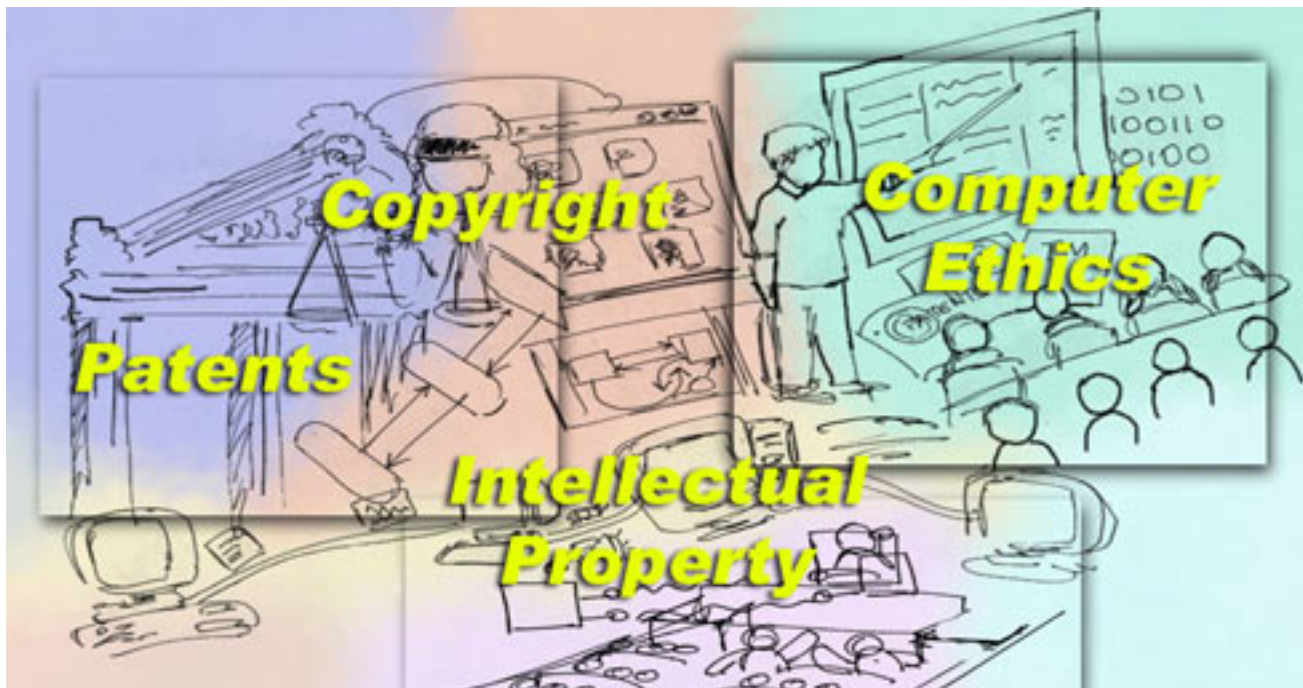




## An Intellectual Property Course For CS Majors

by John P. Kozma and  
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The  
Information  
Technology  
Explosion --  
Who Will  
Benefit?



Advances in  
computer

and information technology have brought tales from science fiction to life. Today's ubiquitous cell phones have taken the place of Dick Tracy's two-way wrist radios. Furthermore, the "dawning of the information age," prophesied in the 70's and 80's in books like Alvin Toffler's *Future Shock* [22] and *The Third Wave* [23], has arrived. The influence of electronic communication on work, commerce and recreation was prominent in Toffler's vision of the future. Perhaps even more telling was his suggestion that the barrage of information from so many sources would raise the premium not just on access, but on the ability to filter out unneeded data. The abundance of "information portals" on the Internet demonstrate the wisdom of Toffler's prediction.

Who benefits from the technology boom? To a great extent, this is determined by laws

governing intellectual property. The essential motivation for such laws, "to promote the progress of science and useful arts," is stated in Article I, section 8, of the U.S. Constitution. The simplicity of that basic policy and the uncanny foresight of fiction writers and futurists could lead us to believe that our technological progress has been part of a carefully scripted master plan. The details of intellectual property policies, however, are not so simple, and developments in this area of the law over the past two decades have failed to keep pace with our expanding technology.

Patents and copyrights are two well established forms of intellectual property protection. Traditionally, patents have been used to protect inventions of physical devices and processes, whereas copyrights cover artistic works. It has yet to be resolved whether patents, copyrights or some new hybrid appropriate to computer software is the appropriate mechanism for protecting software associated intellectual property [5]. Questions about the scope of software protection (i.e. protection at the level of source code, object code, or user interface "look and feel") have been settled in favor of copyright protection. However, software patents continue to be controversial. The debate over business model patents has been particularly contentious. In 1998 the U.S. Federal Circuit Court of Appeals specifically overruled the exception of business models as patentable subject matter in the case of *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* [21]. Following this decision, the Patent Office removed the references to the business model exception in its patent examination guidelines, and a flood of applications, most for methods of doing business on the Internet, has followed. Typical of the negative commentary on business model patents is that they not only call into question the traditional standards of patent-ability, but also raise policy questions about who should reap the benefits of the Internet as a vehicle for commerce [13]. There has even been legislation introduced that would change the procedures for patenting business methods [3].

The Internet and accompanying technology have not only focused attention on the protection of software, but also on the viability of copyright law for protecting more traditional copyrighted works such as sound recordings and motion pictures. The ease with which such works may be copied and published on the Internet has raised considerable friction between copyright owners and users. In many ways, the suit against Napster [16] is symptomatic of this conflict. Napster is an Internet-based business that enables individual users to copy compressed music files directly from each other's computers. Although Napster itself has not been accused of copyright infringement, it has allegedly engaged in contributory copyright infringement because

it enables others to illegally copy protected works. One commentator has suggested that the inevitability of advances in technology has become an excuse for users to ignore the rights of owners [19]. More practical is the observation that, right or wrong, owners will doubtless be forced to adapt to new ways of doing business [15].

Despite the controversy surrounding questions of intellectual property protection, few in the media or in the legal and information technology professions have recognized the existence of several fundamental issues. James Boyle, a law professor who frequently writes on legal and social theory, argues "[I]ntellectual property . . . provides the key to the distribution of wealth, power and access in the information society" [4]. Clearly, the intellectual property policies can have profound effects on both the monetary rewards for individual efforts and the continued growth of the software industry. Students entering a computer science program might have an interest in intellectual property for its importance to their profession and other reasons as well. Whatever the motivation, an introductory course in intellectual property could have a positive impact on students by encouraging them to think about how policies affect everyone in society, not just themselves. The rapid growth of the technology field has made it increasingly important for computer science majors to understand the impact of legislation on the computer industry. Issues such as software copyright infringement, data mining, and file sharing are important topics. The future of many businesses depends on the legislation that is passed to handle these issues. We describe here our experience with an undergraduate course in intellectual property for computer science students.

## The Esoteric Practice

Patent law is one of the few areas of practice that requires special certification. Patent attorneys must take the state bar exam just like other attorneys, but in addition they are required to pass the patent agents exam administered by the United States Patent and Trademark Office (USPTO). Just as state bars require applicants to be law school graduates, the patent office requires those taking the patent agents exam to hold a science or engineering degree from an accredited four-year college [24]. Actually, it is possible to become a patent agent, which entitles one to represent inventors before the patent office, without going to law school. However, because patents frequently involve matters beyond the basic process of applying for a patent, like license agreements, most practitioners are attorneys. As such, patent law is a highly specialized field. Even CEOs with technical backgrounds and corporate attorneys, each knowledgeable in one area but lacking in the other, find the intricacies of patent law

beyond their comprehension [9].

The esoteric nature of patent law also manifests itself in decisions by the Supreme Court. Donald S. Chisum, a professor and author of several books on patent law, analyzed Supreme Court patent cases over the past fifty years and concluded that the standards spelled out by the court for judging patent-ability have not been helpful. He suggests that one reason for the poor quality of decisions may be the poor quality of scholarly writing on patents[7].

Chisum focuses the majority of his criticism on the lack of clarity of Supreme Court decisions rather on their pro or anti-patent stance. The court's lack of clear stance is sensible as the task of deciding policy issues, whether to favor intellectual property owners or users, belongs to the legislature and not the courts. It would certainly be cause for alarm if patent attorneys, who have a vested interest in encouraging the filing of patent applications, were able to dictate such policies.

## Balancing The System

The current trend in the courts is toward favorable treatment of patent owners. The number of patent application filings has increased. Furthermore, patents are enforced more vigorously and are upheld more frequently in infringement suits than in the past. One practicing patent attorney suggests the new patent policies stem from the special appellate court created in 1982 to handle patent cases[6]. Rochelle Cooper Dreyfuss, a law professor, offers the different explanation that many types of innovations, particularly business methods, were not previously considered patentable. Consequently, examiners in the patent office have no body of existing patents to compare the novelty of incoming applications to and consequently allow many patent claims that should be rejected [11].

Yochai Benkler, another law professor, suggests the conflict over intellectual property policy is not between owners and users of protected works. Noting a trend in legislation and court decisions favoring the owners of large collections of protected works, Benkler contends the real battle is between traditional "industrial" producers of information products and Internet-based peer producers. Large software vendors, for example, make extensive use of mass-market licenses for off-the-shelf software products. Such licenses are often called "shrink wrap licenses" because they state that the end user indicates acceptance of their terms by opening the sealed package in which the

software disks are sold. Major legislation in this area includes the Uniform Computer Information Transactions Act (UCITA), a uniform state law that purports to validate such licenses. Federal legislation cited by Benkler includes the recently enacted Digital Millennium Copyright Act, which attempts to regulate access to encrypted copyrighted works, and a proposed bill that would extend copyright-like protection to information in databases [2].

It should come as no surprise that the commentators who appear most concerned about pro-owner trends are attorneys in academia, whereas practicing attorneys write favorably of pro-owner developments. The debate over UCITA provides further insight into the motivations of the parties to the broad discussion on the relative rights of software users and producers. A generally favorable review of Virginia's recently passed version of UCITA is given by Scott Spooner, a practicing attorney. Spooner characterizes UCITA as simply a clarification of the law regarding shrink wrap licenses [20]. By contrast, Barbara Simons, former president of the ACM, points out many of the pro-vendor aspects of UCITA, most notably how it allows software manufacturers to disclaim all liability for damage caused by defects in their products [18].

Although patent attorneys and examiners in the patent office are technically trained, the judges and legislators responsible for formulating our intellectual property policies often are not. By the same token, professional programmers and software engineers who lack legal training are unlikely to offer useful input on who should control the fruits of their labor. One way to insure a more balanced debate on intellectual property issues in the future is to introduce computer science students to intellectual property concepts.

### **A Course Proposal: Intellectual Property And Information Technology**

Intellectual property in undergraduate computer science programs, if it is dealt with at all, is relegated to a single course in ethics and social issues. In many programs, a single credit hour seminar is offered with the apparent goal of satisfying accreditation criteria for oral and written communication skills and social and ethical implications of computing [8, 17]. A somewhat more comprehensive treatment of intellectual property has been suggested in a course proposal on computer law by David Kay [14].

We believe a more comprehensive study of intellectual property can have an important influence on the career choices of computer science majors. On the other hand, it



should not necessarily be a required part of the curriculum. At the College of Charleston, the development of communication skills and the treatment of ethics and social issues are integrated into the entire program of study, and are particularly emphasized in a capstone course in software engineering. Computer science students who are interested in patents, copyrights, and other types of legal protection for software should be able to learn about them in an elective course. To that end, we have embarked on the development of a course entitled "Intellectual property and information technology." At present, the course is being offered on an independent study basis. It is hoped that the course can be offered as a regular computer science elective in the future, and that it may generate interest among students majoring in math, other sciences, and perhaps business. An excerpt from the original course syllabus follows:

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#### Course Objective:

The goal of this tutorial is for the student to gain a basic understanding of intellectual property law concepts as they apply to information technology, particularly computer software. Assignments will focus on the effects of legislation and court decisions that impact computer related intellectual property, use of online resources to conduct patent novelty searches, drafting patent applications, and patent office rules and procedures. A concurrent objective of the assignments will be to help the student(s) prepare to take the Patent Agents Exam, administered by the USPTO. A further goal is to develop a resource, in the form of a web page, that can be used by faculty and students in the computer science department to obtain basic information about intellectual property law. The course grade will be based in part on a seminar presentation by the student (s) at the end of the semester.

#### Tentative list of assignments:

1. Report on the significance of the following court decisions as regards intellectual property rights in computer software. Suggested references are included for several of the cases.
  1. *Diamond v. Diehr*
  2. *Apple v. Franklin*
  3. *Vault Corp. v. Quaid Software*
  4. *Feist Pubs., Inc. v. Rural Tel. Serv. Co.*  
see <http://www.ablondifoster.com/library/m1075.htm>
  5. *State Street Bank & Trust Co. v. Signature Financial Group*  
see <http://www.lawnow.com/Products/LegalRegArticles/>

[Middleton/middletontxt.htm](http://Middleton/middletontxt.htm);

see also the Priceline.com and Amazon.com patents

6. *A&M Records, Inc., et al. v. Napster, Inc.*

7. *MPAA v. Reimerdes, Corley and Kazan*

see <http://eon.law.harvard.edu/openlaw/>

For each case, identify the parties and issues, and describe the effect of the court's decision.

2. Summarize the effects of the following items of legislation:
  1. 1980 Amendments to 101 and 117, title 17, United States Code, regarding computer programs
  2. Semiconductor Chip Protection Act
  3. Computer Software Rental Amendments Act of 1990
  4. UCITA
  5. Digital Millennium Copyright Act (DMCA)
3. Discuss the relative advantages of the following intellectual property forms for protecting software:
  1. copyright
  2. patent
  3. trade secret

The discussion should focus on the following features of each form:

1. monetary cost, both initial and throughout the life of the property
    2. duration of protection
    3. scope of protection, i.e., what exclusive rights are conveyed
    4. subject matter limitations, i.e., what kinds of property may be protected
    5. uniformity of protection from state to state and country to country
  4. Using online tools on the USPTO web site, perform a patent novelty search for a hypothetical computer related invention. Report on the relevant classifications within the patent classification system for the invention. Using the results of this search and the Examination Guidelines for Computer-Related Inventions (available from the USPTO website), prepare a patent application for the invention. Look up and report on applicable provisions in the Code of Federal Regulations (CFR) and the Manual of Patent Examining Procedure (MPEP) regarding electronic filing of the application, and a provisional application for the invention.
  5. Research answers for previous offerings of the Patent Agents Exam.
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## The Course In Practice

The current offering of the course does not use a textbook. Instead, we have taken advantage of the wealth of material available on the Internet. Each student, with a minimum of additional guidance from the instructor, researches information on the topics listed in the syllabus. Some of the topics in the syllabus include suggested references to be used as a starting point for the investigation, but in most cases student's are required to be self-reliant. After preparing a report on each topic, the student engages in a follow-up discussion with the instructor. Although the list of topics was found to be overly ambitious in scope for an individual student as an independent study course, the general approach of a report and follow up discussion seems to be an effective way to focus on important concepts. The course should be readily adaptable to a regular classroom format. With a larger number of students, each could be assigned three or four topics to report on, either individually or in groups. Each topic could then be presented orally, and the entire class could participate in a follow-up discussion.

Illustrated below are some of the activities and cases researched by the students as of mid-semester. Examples of materials the student used to prepare preliminary reports and a brief statement of the main concepts learned are included for each summary.

One of the completed activities was a patent novelty search. This required going to the USPTO website and researching patents currently on file. On the site, the classification index [26] was used to find patents that were similar to the invention being researched. As similar classifications were found, specific patents were investigated to look for similarities between the claims made by the researcher and those currently on file.

A second useful application of the USPTO website was the patent boolean search page [25]. By entering different phrases, users can quickly locate specific patents that interest them. This tool was used to find the "one click" business patent owned by Amazon.com. Once found, the wording and structure of the document were studied. This exercise was helpful in understanding what is involved in writing a patent.

Other course activities required looking up court cases pertaining to software intellectual property issues. One of the best web sites found for looking up particular cases was GigaLaw.com [24], which has an extensive library of cases available. In the *Diamond v. Diehr* case [25], Diehr pursued having a rubber curing process patented,



which used a computer-stored program in the process. Prior to this 1981 case, software-driven machinery were not considered patentable. This ruling favored Diehr, which set a precedent that allowed patents on processes that include computers.

In the *Feist Pubs v. Rural Telephone* case, Feist wanted to create a phone book using telephone numbers that were listed in some of his competitor's phone books. The phone company's position was that the phone numbers were protected by copyright and could not be copied and redistributed. The courts ruled in favor of Feist publications, setting a legal standard for the level of originality in copyrights [26]. *Feist Pubs v. Rural Telephone* is an important case for the information age because reselling public domain data is the backbone of many small businesses.

*Apple Computer v. Franklin Computer* was a court battle deciding whether operating systems should be allowed copyright protection. Franklin Computers had come out with an Apple computer clone, and it was pre-installing Apple's operating system on those machines. The courts decided in favor of Franklin in the federal district court, but Apple won on appeal [27], establishing copyright as the standard intellectual property form for protecting computer software.

## Conclusion

The information technology explosion of recent decades has highlighted the need for sound intellectual property policies. Traditionally, this area of the law has been dominated by patent attorneys. Although intellectual property law is a complex subject, computer science undergraduates are clearly capable of learning its basic concepts. This exercise benefits students by giving them the opportunity to consider careers in intellectual property law, either as patent agents or as attorneys should they decide to go on to law school. It also helps insure that tomorrow's information technology professionals will be able to make informed contributions to intellectual property policies that will serve us in the 21st century.

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