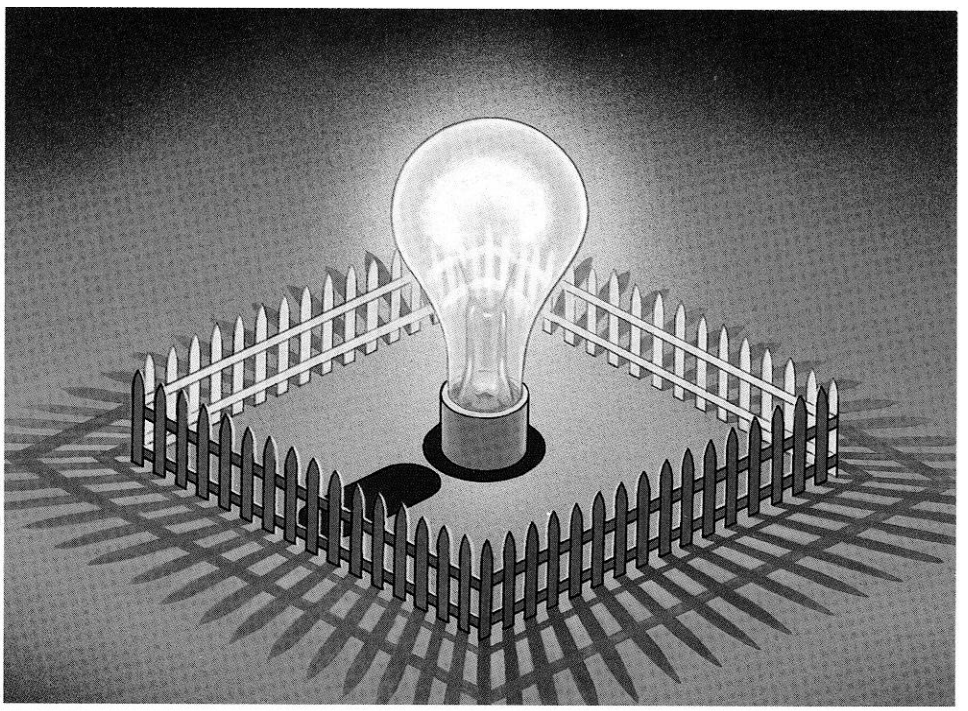
Developments on the Intellectual Property Front



The rift between what computing professionals think the law of intellectual property rights in computer programs ought to be and what intellectual property professionals (mainly lawyers) think it ought to be is growing wider every day. At the moment, it appears that the intellectual property professionals are outmaneuvering the computing professionals by working toward establishing their vision of the proper rules on software intellectual property rights as "the law" before the computing professionals even know that the rules that will govern their conduct are being decided.

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While there are unquestionably pros and cons to the software patent and other intellectual property controversies, the unfortunate fact of current U.S. policy on intellectual property rights for such an important product as computer programs is that the policymaking seems largely to be occurring either behind closed doors or in courtrooms across the country in cases in which the court papers are filed under seal. This effectively precludes those whose work will be substantially affected by the resolution of these controversies from having any meaningful input into the process of shaping the law in a manner that would make sense to them. Exclusion of computing professionals from the policymaking process also means the opportunity to persuade them of the merits of proposals eventually adopted has been lost. This, in turn, may have serious consequences for the enforceability of the proposals if they become the law.

This column will report on this rift by bringing readers up to date on some national and international developments in the intellectual property rights arena and by reporting the results of a survey on intellectual property rights conducted in August 1991 at the SIGGRAPH conference in Las Vegas. The SIGGRAPH survey results are much the same as the CHI '89 survey results reported in the May 1990 "Legally Speaking" column (pp. 483-487). Both surveys show strong support for copyright protection for source and object code, but little support for copyright or patent protection for most aspects of user interfaces and internal structural features of computer programs. If anything, the SIGGRAPH survey results show even stronger opposition to copyright protection for look and feel than did the CHI '89 survey, as well as stronger opposition to patent protection for algorithms.

Further evidence of significant opposition to patent protection for computer program-related inventions can also be found in a large number of letters sent by computing professionals in response to last summer's call for public comment by a U.S. Advisory Commission on

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Patent Reform that was ostensibly created to address questions about patent protection for software innovations, among other issues. The Commission's recently released draft report dismisses concerns raised by software patent opponents, and urges, if anything, broadening the role of patents for software innovations. That the Commission should be preparing to make these recommendations is not surprising to those who know the composition of the subcommittee in charge of the computer program-related invention issues. This aspect of the Commission's work seems to be a thinly disguised effort to prevent a more democratic public debate on software patent issue in which the views of computing professionals could be considered.

Other events happening outside the realm of public debate include the recent release of a draft agreement on intellectual property rights being considered for inclusion as an addendum to the General Agreement on Tariffs and Trade (GATT). Although the draft does not directly say so, one of its provisions can be read as requiring member nations to provide patent protection for software innovations. This aspect of the GATT-related draft agreement would seem to implement another recommendation of the U.S. Advisory Commission on Patent Reform draft report which urges the U.S. to strongly encourage other countries to broaden patent protection for program-related inventions.

The SIGGRAPH Survey

At SIGGRAPH '91, a panel on intellectual property rights organized by Xerox researcher Michel Denber featured four speakers: John Perry Barlow, songwriter and a co-founder of the Electronic Frontier Foundation; Isaac Kerlow, computer artist and chair of the Computer Graphics Department at the Pratt Institute; Peter Deutsch, chief scientist at ParcPlace Systems, and Pamela Samuelson, professor of law specializing in software intellectual property law. (Denber tried to persuade a number of representatives from firms involved in some of the well-publicized lawsuits to participate on this SIGGRAPH panel to explain why their firms' positions in the lawsuits will be good for the field, but no firm was willing to have their people comment until the lawsuits are decided.)

After the panelists spoke and answered questions, the audience was asked to respond to a survey nearly identical to the one on intellectual property rights conducted at CHI '89. There were 345 respondents to the SIGGRAPH intellectual property rights survey. As with the CHI '89 survey (which had 667 respondents), the SIGGRAPH survey was filled out by people who mainly worked for firms that develop software for commercial purposes (only 1-in-5 of the respondents to these surveys worked for universities). As one might expect, a higher proportion of the CHI '89 survey respondents identified themselves as user interface designers and human factors engineers than did the SIGGRAPH survey respondents, and more of the SIGGRAPH respondents identified themselves as computer artists and programmers, but otherwise the respondent demographics were quite similar (including the 15-16% who reported being managers on both surveys). This means there are now approximately 1,000 computing professionals who have made their views known on the major intellectual property controversies of the day.

Overview of Findings on Various Aspects of Software Protection

There were three aspects of programs that enjoyed significant support for intellectual property protection among the SIGGRAPH survey respondents. Like the CHI '89 respondents before them, SIGGRAPHians overwhelmingly supported copyright protection for the source code of computer programs. Although a strong majority also supported copyright protection for object code (as had the CHI survey respondents), support for copyright protection for object code was nonetheless lower among both SIGGRAPH and CHI respondents than was the support for copyright for source code. The other aspect of software that enjoyed strong support for copyright protection from SIGGRAPH respondents was computer-generated images (a subject about which no inquiry was made on the CHI survey). Table 1 reflects the results of this part of the SIGGRAPH survey.

Although the SIGGRAPH survey results on user interface issues were quite similar to those from CHI '89, there were some differences in their views on protection for internal design elements of programs. A slight majority (52%) of CHI '89 survey respondents had supported copyright or patent protection of pseudocode whereas only 39% of SIGGRAPH respondents favored protection for it. There was also somewhat less support among the SIGGRAPH respondents for copyright or patent protection for modular design. Some 40% of CHI respondents had favored protection for modular design, but only 28% of the SIGGRAPH respondents favored such protection.

The most striking contrast between the SIGGRAPH and the earlier CHI survey results was the dramatically lower support for patent protection for algorithms among SIGGRAPHians. A total of 39% of the CHI survey respondents had favored patent protection for algorithms, and another 8% favored copyright protection for them. This was less than a majority opinion, but among the SIGGRAPH respondents, only 13% favored patent protection for algorithms (with another 9% favoring copyright protection for them). To put it a slightly different way, nearly 4 out of 5 of the SIGGRAPH respondents were against patent or copy-

right protection for algorithms, whereas the CHI respondents were almost evenly split on the issue.

A number of respondents commented on software patent issues in the blank space at the end of the SIGGRAPH survey. One person expressed the view that patents could provide significant protection for smaller software developers against "theft" of their ideas by larger firms. Others commented that patents on truly inventive ideas would be OK, but thought that too many patents had been granted to trivial things. Still others objected to the duration of patents, suggesting that five years might be a more appropriate duration than 17 years. Another comment suggested that those who independently developed an idea should not be precluded from using it, and objected to patents because of the completely exclusionary character of this form of intellectual property protection.

Stronger Opposition to Look and Feel

Opposition to copyright protection for the look and feel of computer programs was also stronger among the SIGGRAPH respondents than among the CHI '89 respondents. More than three-quarters of the CHI respondents had expressed opposition to protection for the look and feel of computer programs. Of the SIGGRAPH respondents, however, 94% were opposed to look and feel protection.

The SIGGRAPH survey questionnaire asked the same two questions on predicted effect on the respondent's own work and on the industry if the currently pending copyright lawsuits established strong protection for the look and feel of user interfaces. As with the SIGCHI survey, a 5-point scale was used to gauge the respondents' predictions. (see Table 2)

The average predicted effect of strong look and feel protection on one's own work from the SIGGRAPH survey was 2.12; the average for the CHI '89 survey was 2.049. A larger percentage of the SIGGRAPH than CHI respondents (28% vs. 19%) did not expect an effect on their own work. Even so, 68% of the SIGGRAPH respondents anticipated a negative effect on their own work, and only 4% thought that strong protection would have a positive effect on their work.

As with the CHI survey, more SIGGRAPH respondents predicted negative effects for the industry than for their own work if the look and feel lawsuits established strong protection for user interfaces. The average predicted effect on the industry score on the same 5-point scale was 1.58 for the SIGGRAPH survey; it had been 1.646 in response to the CHI survey. Only 4% of the SIGGRAPH respondents predicted a positive impact on the industry if the look and feel lawsuits were successful, whereas 10% of the CHI respondents had anticipated a positive impact on the industry from success by plaintiffs in these suits. Only 7% of SIGGRAPH respondents expected no effect on the industry (quite similar to the 4% response from the CHI survey) if look and feel protection became the law. The identical percentage of SIGGRAPH and SIGCHI respondents—namely 57%—expected strong negative consequences to the industry from strong look and feel protection, as Table 2 demonstrates.

Table 1.
Support for Protection by Copyright or Patent*

	Copyright	Patent	Both	Neither	N
For:					
source code	86%	2%	3%	8%	318
object code	65%	2%	3%	27%	293
pseudocode	37%	1%	1%	61%	278
module design	18%	9%	1%	72%	269
algorithms	9%	12%	1%	79%	303
UI commands	6%	1%	0	92%	294
icons	43%	0	1%	56%	307
UI layout	19%	1%	1%	79%	302
UI sequences	9%	1%	0	90%	295
look and feel	5%	0	0	94%	312
UI functionality	5%	4%	0	91%	300
comp images	81%	1%	0	18%	316

*of those expressing an opinion

Table 2.
Predicted Effect of Look and Feel Protection

	1	2	3	4	5
On own work:					
SIGGRAPH	28%	40%	28%	2%	2%
SIGCHI	35%	36%	19%	7%	2%
On the industry:					
SIGGRAPH	57%	32%	7%	3%	1%
SIGCHI	57%	29%	4%	7%	3%

1 = strongly negative, 3 = no effect, 5 = strongly positive

Similar Results Concerning Other UI Features

Apart from the stronger opposition to look and feel protection, the SIGGRAPH survey yielded quite similar results to the CHI '89 survey concerning other aspects of user interfaces. A total of 92% of SIGGRAPH respondents opposed protection of user interface commands, as had 88% of the CHI respondents. In addition, 91% of SIGGRAPH respondents opposed patent or copyright protection for user interface functionality, as had 83% of CHI respondents. There

was somewhat less support among the SIGGRAPH than CHI respondents for protection of user interface screen layouts (79% opposition among SIGGRAPH and 69% among CHI respondents) and for user interface screen sequences (90% opposition among SIGGRAPH and 79% among SIGCHI respondents). Icons, however, were thought deserving of protection by almost equal percentages of SIGGRAPH (44%) and SIGCHI (43%) respondents.

One additional question asked on the SIGGRAPH survey that was not asked on the CHI survey was whether copyright or patent protection should be available for computer-generated images. Of the SIGGRAPH respondents, 81% favored copyright protection for such images. (Another 1% thought patents should be available for them). The difference between the computer-generated images and icon responses was somewhat surprising given that icons are just little images. Michel Denber thought the difference in responses to these two questions might be due to a perception by people in the SIGGRAPH community that there are comparatively few effective ways of iconically representing particular functions, but an infinite number of interesting computer-generated images. Because of this, people may not want to be forbidden from using an effective icon, but may not object to protection of computer art. Artistic expression is based on a much less constrained intellectual space, where the existence of one image does not preclude the creation of others on a similar theme.

Other Survey Findings

As with the CHI '89 survey, the SIGGRAPH survey asked respondents how constrained they currently felt about the uses they could make of research and design innovations they saw at SIGGRAPH after the conference. The results were quite similar to those obtained in response to a nearly identical question on the CHI '89 survey. Some 31% of the SIGGRAPH respondents (as compared with 31% of the CHI respondents) felt no restriction; that is, they felt they could freely use anything they learned about or saw at the conference.

As compared with 49% of CHI respondents, 54% of SIGGRAPH respondents felt some restriction; that is, they felt that they could not copy exactly, but could reimplement or reengineer any interesting designs they saw at the conference. Also, 14% of the SIGGRAPH respondents (as compared with 19% of CHI respondents) felt significant restrictions; they could copy only general concepts or ideas at the research stage. One percent of both groups felt totally restricted; that is, once they saw something at SIGGRAPH, they felt they could not copy it into a work of their own.

Those who attended the SIGGRAPH intellectual property panel felt reasonably familiar with these kinds of legal issues. A total of 17% indicated they felt moderately familiar with the issues before attending the panel. Another 18% felt highly familiar with them. Only 11% indicated they had not been familiar with the issues before attending the panel session. Only one-quarter of the SIGGRAPH respondents noted that attending the panel session had changed their views on the legal issues. (In contrast, half of the respondents had changed their minds on the issues after hearing the CHI debate.) Of those whose minds were changed as a result of attending the SIGGRAPH session on intellectual property rights, only 1 in 8 thought that protection should be stronger after hearing the issues discussed. (The CHI survey showed a respondent shift in the same direction, although by a different margin. Only 1 in 11 changed his or her mind to thinking that protection should be stronger after hearing the CHI debate.)

As with the CHI '89 survey, there was majority support for the idea that the SIG should use the results of the survey to take an official position on the legal issues. Some of those who opposed this idea did so because the respondent group was not a representative sample of the SIGGRAPH membership. Several SIGGRAPH respondents expressed the view at the end of the survey that ACM and their SIG should get more actively involved in the legal issues, not only by educating its membership about them, but also by lobbying Congress about changes in the law or taking a stand in some lawsuits. (In fact, ACM's Executive Committee has approved a proposal for beginning an investigation of software intellectual property issues. However, efforts have yet to get underway.)

Developments on the Patent Front

About two years ago, after some National Research Council workshops aired conflicting views on software intellectual property issues, a Congressional hearing was held on software intellectual property issues. At this hearing, software developers Mitch Kapor and Dan Bricklin, among others, expressed a number of concerns about patent protection for software innovations. Some of the concerns pertained to problems with how the U.S. Patent and Trademark Office (PTO) was implementing its policy on computer program-related inventions (e.g., problems arising from the PTO's ignorance of the prior art and too low a standard as to what software innovations were inventive enough to be patented). Some concerns were more fundamental in nature (e.g., whether patent protection for software innovations might significantly raise the barriers to entry for the software industry, especially worrisome because small software firms have been at the forefront of innovation in this industry).

At about the same time, the U.S. began to consider proposals to

The most striking survey contrast was the dramatically lower support for algorithm patent protection among SIGGRAPHians.

change its patent law to make it more like the patent laws of other industrialized nations. To address questions that have arisen concerning patent protection for computer program-related inventions (including those raised at the Congressional hearing) and to consider the patent harmonization proposals and some other issues, the U.S. Department of Commerce established an Advisory Commission on Patent Law Reform.

Although one important set of issues to be addressed by the Commission concerned software patents, no effort was made to find a prominent computing professional who had no stated position on the issues to serve on the Commission. The person appointed to serve as chair of the Commissions' working group on the computer program-related inventions was Howard Figueroa, an IBM executive who had publicly spoken in favor of patent protection for computer program innovations before his appointment to the Commission. (Interestingly, 20 years ago IBM was one of a number of computer firms who submitted an amicus brief to the U.S. Supreme Court in the *Gottschalk vs. Benson* case arguing against patent protection for algorithms and other program-related inventions because of their mathematical character. The nature of program algorithms has not changed at all in the past two decades, but IBM's position on the patent issues has completely reversed itself.)

The public interest representative on the Commission's working group on the computer program issues was William Keefauver, the lawyer who argued the *Benson* case before U.S. Supreme Court on behalf of AT&T (the assignee of Benson's patent rights). Keefauver has made no secret of the fact that he regards the Supreme Court's ruling that Benson's algorithm for converting binary coded decimals to pure binary form was unpatentable was wrongly decided. With Figueroa and Keefauver on the working group on the computer program-related issues, along with three other lawyers specializing in patent law (and an IBM attorney as an alternate member), it was widely expected that the group would conclude that patents were appropriate for computer program-related inventions. Indeed, any other conclusion would have been extremely surprising. (Samuelson has yet to meet a patent lawyer who has doubts about the advisability of patent protection for software innovations.)

Last spring the Commission published a set of questions for comment from the public. Most of the questions dealt with patent harmonization and other issues, but the first group of questions focused on the computer program-related issues. Even the manner in which the Commission stated its questions on the computer program issues suggested something other than an open mind on the issues. One of the questions, for example, asked whether there was any reason why patent protection should be removed for computer program-related inventions. This way of stating the question suggests the law clearly provided patent protection for computer program innovations when, in fact, the case law is in considerable disarray on this subject.

The Commission has acknowledged receiving 545 letters in response to this set of questions. Nearly 80% of the letters addressed the computer program-related questions; 60% addressed only the computer program-related issues. The Commission has not provided further information about the letters, such as the numbers of respondents who opposed or supported patent protection for computer program innovations. Electronic versions of some of these letters were posted on electronic bulletin boards. From these, it is clear that quite a number of the letters were critical of software patents and quite a number came from computing professionals.

The draft report of the Commission's working group on the computer program-related issues was released last January. Unsurprisingly, it concludes that patent protection for computer program-related inventions is well-established in the law and should be continued. By endorsing the view expressed some years ago by patent scholar Donald Chisum that algorithms and other computer program-related inventions are patentable because they are processes and have a technological character, the draft report seems to call (as Chisum also did) for the overruling of the 1972 *Gottschalk vs. Benson* decision in which the U.S. Supreme Court decision ruled that computer program algorithms were unpatentable on account of their mathematical character.

The draft report states that it considered all the letters submitted in the response to the request for public comments. But the report mainly mentions potential objections to the patenting of software innovations as a prelude to dismissing them. (This part of the report follows the form: "A" is not a problem because of X; "B" is not a problem because of Y; and so on.) The draft report does, however, recommend a number of changes in PTO procedures for dealing with program-related inventions. For example, it states that the Office should have better access to the prior art for software innovations and better ways of classifying software so that people can search more effectively for what has been patented before.

The draft report also asserts that Europe and Japan now strongly support patent protection for the patenting of computer program-related inventions, and that the major patent offices around the world are operating in substantial harmony concerning patent protection for software innovations. It further urges the U.S. to press those nations that do not provide patent protection for software innovations to modify their policies to make program-related inventions patentable, saying that the U.S. competitive edge in software depends on the availability of patent protection. (It would take an entire column to explain why the report's assertions about other nations' patent standards are not completely accurate, but it is worth noting that the competitive edge currently enjoyed by the U.S. software industry was achieved in a legal environment in which patent protection was not available for most computer program-related inventions.)

GATT-Related Developments

For the last several years, negotiations have been underway to reach agreement on international norms on intellectual property rights within the framework of the GATT. In mid-December 1991, a draft agreement on Trade Related Intellectual Property Rights (TRIPS) aimed at achieving this goal was distributed. It is now under consideration by member nations. Negotiations are expected to continue for some time. It is far from clear that this draft will be adopted, mainly because Third World and industrialized nations have not yet resolved some long-standing disagreements on a number of its provisions (such as those requiring patent or patent-like protection for new species of plants).

Only a few of the provisions of the draft TRIPS agreement deal with computer software issues. The main provision of the TRIPS agreement concerning intellectual property rights in computer programs is that which would require member nations to protect computer programs as "literary works" under copyright law. The patent section of the draft TRIPS agreement does not directly mention computer software, but the provision does say that patents are to be available without regard to the field of technology to which they pertain. Since it is difficult to dispute that computer programming pertains to a "field of technology," this provision can be interpreted as requiring member nations to protect software innovations by patent law (notwithstanding the statutory provisions that many nations have excluding many program-related inventions from patents and judicial interpretations in many nations that have tended to limit the extent of patent protection for software innovations).

Those who support this expansive interpretation of the draft TRIPS agreement, like those who wrote the Patent Advisory Commission draft report, tend to assert that there is already a significant consensus, at least among industrialized nations, in favor of patent protection for software innovations (when, in fact, there is not). They also tend to ignore significant differences in patentability standards employed by those nations that do provide some degree of patent protection for software innovations. At an international conference on software intellectual property rights sponsored by Japan's Software Information Technology Center held in Tokyo in December, Jean-Francois Verstrynge, the head of the EC Directorate which issued the EC Directive on Copyright Protection for Computer Programs, after listening to discussion of British, German, U.S. and Japanese patent caselaw on patent protection for computer program-related inventions, stated that the discussion had convinced him that it was premature to say there was sufficient consensus on this set of issues to make it part of the GATT framework.

Conclusion

The SIGGRAPH intellectual property rights survey, like the CHI '89 survey before it, demonstrates that there is strong support for copyright protection for source and object code, but strong opposition to extending copyright protection to such things as look and feel within these segments of the technical community. Those surveyed expected negative consequences for their own work and for the industry and community of which they were a part if the look and feel lawsuits established strong copyright protection for user interfaces. The survey also suggests there is a significant opposition within these communities concerning patent protection for software innovations.

Neither the SIGGRAPH or the CHI '89 surveys purport to be anything more than what they are: interesting sets of data about what people in these communities think about the legal issues that affect their field. It would be interesting to know whether these surveys accurately reflect the membership views of the ACM or the various SIGs. Survey respondents want ACM or their SIGs to get more involved in the legal issues. Some of this involvement might be educational in nature; some might be more proactive than that. Perhaps further surveys would be useful as well.

Intellectual property rights are, of course, not a popularity contest. What people in a particular field think the law should be on a particular issue, even if by substantial margins, does not necessarily mean the courts or the legislature will or should agree with that group's assessment. But what people think about the norms that will govern their work and the industry as a whole ought to matter (if for no other reason than if there is a substantial gap between what people in the field think the rule should be and what the rule is, they may not respect the rule, or may devise

strained interpretations of it that might lead to more litigation.) Resentment at being excluded from the process of shaping the rule can also undermine the effectiveness of a rule.

It may be, as some have suggested, that the disagreements that have arisen within the technical community about intellectual property rights issues are simply reflections of distress at the changing norms of the field. Just as the prairies of the western U.S. were once open to any traveler who might cross them or settle there, software was once developed in an environment in which intellectual property rights played a negligible or minor role. Just as the erection of fences marked the passing of the western frontier, the passage of the software copyright amendments and new interpretations of patent law that have expanded the role of patents in the protection of software innovations may simply be abstract legal equivalents to the barbed wire fences that brought about the end of the western frontier.

Computer programs are unquestionably an important item of commerce, not only in the U.S., but in many other nations. Given the international nature of commerce of this product and its associated services, it is understandable that the U.S. and other exporters of software products would press other nations for adoption of relatively uniform rules for protecting intellectual property rights in software. But it is a bad way for the U.S. (or any other country) to make public policy by pushing for adoption of an international treaty requiring member nations to give patent protection to software innovations and then use that requirement as a basis for asserting that the U.S. (or any other country) has to patent software innovations in order to comply with its treaty obligations.

Computing professionals rely on the strength of the software industry, both for their employment and for the tools with which they conduct their work. They have a strong and abiding interest in the success of this industry, and in the existence of intellectual property rights that provide needed incentives for investment in the industry. In addition, they have a strong sense of professional responsibility and they care very much about the norms that govern their work. By virtue of their experience in the field, computing professionals also have some insights about what kind and what extent of intellectual property protection for software is appropriate that those who are making policy in this area would do well to heed. ◘

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