

The Honorable Thomas S. Zilly

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

TIM and PENNY PATERSON, husband and)
wife and the marital community thereof,)
Plaintiffs,)

No. 2:05-CV-01719-TSZ

v.)

**DECLARATION OF
PROFESSOR LEE A.
HOLLAAR**

LITTLE, BROWN AND COMPANY, a)
Massachusetts state corporation, TIME)
WARNER BOOK GROUP, a Delaware state)
corporation, HAROLD EVANS ASSOCIATES)
LLC, a New York state limited liability)
company, HAROLD EVANS, and DAVID)
LEFER,)
Defendants.)

I, Lee A. Hollaar declare:

INTRODUCTION

1. I have personal knowledge of the subject matter of this declaration, and if called as a witness, would testify thereto.
2. I am a Professor of Computer Science in the School of Computing at the University of Utah, where I have been a faculty member since 1980. Prior to that, I was a faculty member at the University of Illinois at Urbana-Champaign and a senior research engineer in its Computing Services Office, working with networking and minicomputers. I received my Ph.D. in Computer Science

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1 from the University of Illinois at Urbana-Champaign in 1975, and my B.S. in
2 Electrical Engineering from the Illinois Institute of Technology in 1969.

3 3. As a professor at the Universities of Illinois and Utah, I have taught courses in
4 software and system development. Of particular relevance to this case, I taught
5 the course in operating systems in 1981 through 1988, and in 1980 taught the
6 microcomputer programming course.

7 4. I have also taught computer and intellectual property law in the School of
8 Computing since 1984. I am the author of *Legal Protection of Digital*
9 *Information* (BNA Books 2002), and in writing that book, I have extensively
10 researched both the current copyright laws with respect to computer software
11 and their historical development.

12 5. While on sabbatical during the 1996-97 academic year, I was a Fellow with the
13 United States Senate Committee on the Judiciary. As part of the intellectual
14 property unit staff for the Committee, I was the technical advisor on digital
15 copyright issues, including work that led to the Digital Millennium Copyright
16 Act.

17 6. I have been an expert or consultant in a variety of copyright, patent, and
18 antitrust cases dealing with computer software.

19 7. Of particular interest to this case, I was the primary technical expert in the
20 *Caldera v. Microsoft* case cited by the defendants in their Motion for Summary
21 Judgment. In footnote 12 of their motion, defendants indicate that "In his
22 research for the Book, Mr. Evans relied upon the Caldera case." However, that
23 case had nothing to do with the origin of QDOS from CP/M but was concerned
instead with how compatible DR DOS, the Digital Research "clone" of MS-
DOS, was with various applications programs and whether Microsoft had taken
steps so that Windows would not function well with "clones" of MS-DOS.

8. I have included with this declaration a copy of my resume as **Attachment A**
and as **Attachment B** a summary of the cases in which have been an expert,
consultant, or special master as **Attachment B**.

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9. In my opinion, the defendants have taken demonstrably-false statements and quotes from people without first-hand knowledge of the relationship between CP/M and QDOS, put them in a context that compounds their effect with respect to Mr. Paterson’s work, and failed to subject the work for Mr. Kildall to the same standards, all to support the thesis of the chapter that Mr. Kildall was the “Edison of computers” who was “ripped off” in part by Mr. Patterson’s illegal or immoral activities.

7
10. In the following part of this declaration, I provide the basis for my opinion.

8
FALSE STATEMENTS

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11. One false statement made by the defendants, not in a quotation of another party, is contained in the right-most column on page 412 of the hardbound edition of *They Made America* (“the Book”):

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What Paterson essentially had done was rewrite the bottom part of the software – improving the way files were stored and adapting the program to a 16-bit machine – while copying most of the top part of Kildall’s operating system (the Int 21 commands that allowed the operating system to interact with the application program). Even if QDOS and CP/M were 80 percent different, as Paterson has said, he took almost unaltered Kildall’s Int-21 mechanism – the heart of his innovation.

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12. Even the most cursory look at any CP/M document that describes its application program interface (“API”) would show that statement to be false. CP/M did not use an “Int-21” mechanism, must less have that as its “heart,” because the microprocessors that it ran on, primarily the Intel 8080 and Zilog Z80 did not have a software interrupt facility and therefore no “Int” instruction of any type. Instead, CP/M used a “CALL 5” mechanism, which was simply a call to the subroutine starting in location 5 of memory. (The 8080 also only had a primitive hardware interrupt facility, consisting of letting an external device force the execution of a CALL instruction containing the appropriate subroutine address.)

23
13. Because one of the enhancements of the Intel 8086 over the 8080 was the introduction of a software interrupt mechanism (as well as a better hardware

1 interrupt system), the use of the "Int 21" instruction occurs in QDOS before
2 CP/M or any other Digital Research operating system. It is when CP/M-86 is
3 reworked to produce first Concurrent DOS and then DR DOS that Digital
Research adopts Paterson's "Int 21."

4 14. The calling of the operating system when a function is required by the
5 application program is certainly not original to Kildall. The two systems the
6 Book indicates Kildall wrote programs for each used such a facility. On the
7 "IBM mainframe," the mechanism was called "SVC" (for supervisor call) and
8 on the "DEC PDP-10 minicomputer" it was called "UUO" (for unimplemented
9 user operations). Kildall simply adapted a technique used by the operating
systems of his day to his particular hardware and software configuration.

10 15. It would have taken only minimal effort on the part of the defendants to
11 determine that CP/M did not have an "Int-21 mechanism" and that Kildall's
12 "innovation" was in fact common to most operating systems at the time CP/M
was written.

13 16. In my opinion, the defendants falsely characterized what Mr. Paterson had done
14 in the creation of QDOS and the extent that Mr. Kildall's use of a well-known
computer technique was innovative.

15 17. A second false statement made by the defendants, not in a quotation of another
16 party, starts at the bottom of the right-most column of page 413 of the Book:

17 The copyright law of 1976 was not amended until 1981, specifically to
cover the look and feel of software.

18 18. This statement is part of a discussion why Digital Research or Kildall did not
19 sue those involved in the development of QDOS or MS-DOS for copyright
20 infringement, implying that without such a clear amendment to the copyright
21 statutes, what the Book describes as "the ignorance of judges" would likely
result in losing the case.

22 19. There was *no* amendment to the United States copyright statutes in 1981. The
23 defendants could have easily determined this by referencing the listing of
"Amendments to Title 17 since 1976" that forms the preface of the United

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1 States Copyright Office's Circular 92, *Copyright Laws of the United States*.
2 This is available online at <http://www.copyright.gov/title17/92preface.html>, and
3 indicates that there were no amendments between Public Law 96-517, enacted
4 December 12, 1980, and Public Law 97-180, enacted May 24, 1982.

5 20. Perhaps the defendants were thinking of the 1980 amendment which did
6 concern computer programs. But that amendment did not "specifically ... cover
7 the look and feel of software." Instead, it provided that the owner of a copy of a
8 computer program could make archive copies and adapt the program as
9 necessary to use it. In particular, it replaced the original language:

10 17 U.S.C. § 117. Scope of exclusive rights: Use in conjunction with
11 computers and similar information systems
12 Notwithstanding the provisions of sections 106 through 116 and 118,
13 this title does not afford to the owner of copyright in a work any greater
14 or lesser rights with respect to the use of the work in conjunction with
15 automatic systems capable of storing, processing, retrieving, or
16 transferring information, or in conjunction with any similar device,
17 machine, or process, than those afforded to works under the law,
18 whether title 17 or the common law or statutes of a State, in effect on
19 December 31, 1977, as held applicable and construed by a court in an
20 action brought under this title.

21 with:

22 17 U.S.C. § 117. Limitations on exclusive rights: Computer programs.
23 Notwithstanding the provisions of section 106, is not an infringement
for the owner of a copy of a computer program to make or authorize the
making of another copy or adaptation of that computer program
provided:

- (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
 - (2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.
- Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

1 21. I have extensively studied the copyright statutes, particularly as they pertain to
2 computer software, and I know of no statutory provision, either as part of the
3 original enactment of the Copyright Act of 1976 or in a later amendment, that
4 can be said to “specifically ... cover the look and feel of software.”

5 22. It would have taken only minimal effort on the part of the defendants to
6 determine whether there had been any amendments to the “copyright law of
7 1976” in 1981, or whether any amendments “specifically ... cover the look and
8 feel of software.”

9 23. Even if the defendants really meant that there was new case law in 1981 that
10 pertained to “the look and feel of software,” the statement would still be false.
11 The first case generally regarded as protecting the “look and feel” of a
12 computer program (actually, its “structure, sequence, and organization”), was
13 decided by the Third Circuit on August 4, 1986 (797 F.2d 1222).

14 24. In my opinion, the defendants falsely created a nonexistent amendment to the
15 copyright statutes in order to justify their thesis that Mr. Paterson had acted
16 illegally when he produced QDOS based on the CP/M API documentation. As I
17 will discuss below, not only is this based on a false statement by the defendants,
18 but it was not the law at the time of Mr. Paterson’s activities nor at the time
19 they wrote the statement.

20 THE CONTEXT OF THE STATEMENTS

21 25. In their Motion for Summary Judgment, the defendants indicate a number of
22 challenged statements in the Book and attempt to show that they are supported
23 by quotations from others. But they do not examine the statements in the
context in which they are made.

24 26. The discussion of the “cloning” of CP/M by Mr. Paterson to produce QDOS is
immediately preceded on page 410 by this discussion:

Many people were pirating Kildall’s design in the late ‘70s: Hundreds
of “clones” had been made. Gerry Davis would issue warning letters,
but Kildall found the most effective way to stop the rip-offs, instead of
suing, was to drop in on the infringer and try a little shame. Roger
Mellon bought an operating system from the Palo Alto Computer Store
and was assured it was original. He was astounded when Kildall used

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1 the machine's built-in debugger to view Mellon's memory storage and
2 embedded there was the message: "Copyright 1978, Digital Research."
3 Mellon promptly signed up for a license. Kildall writes, "I put the
4 copyright message in the object code for exactly that purpose, and you
5 had to be a very sophisticated programmer to remove that message. Not
6 only that, if it was removed, CP/M would not run because the operating
7 system checked to see if the message was there before starting, using an
8 encryption scheme that worked quite well." (Kildall had learned the
9 encryption techniques at the Naval Postgraduate School.) In the fall of
10 1979 Roger Billings was doing very well selling a computer system out
11 of his company in Provo, Utah. Kildall and Rolander flew seven hours
12 in single-engine Piper Archer, only to have Billings make them cool
13 their heels in the waiting room. With nothing to do, Kildall played with
14 a sample Billings computer in the waiting room. Using his debugger
15 program, he quickly entered the innards of the computer operating
16 system. There, again, was his copyright message. Kildall writes,
17 "Roger became, quite friendly all of a sudden."

18 27. As with many terms in computer technology, there is no precise definition of
19 "clone." Most would agree that it goes beyond the simple copying (without
20 even removing the copyright notice) in the two examples given above, yet that
21 is how the defendants are using it.

22 28. It is clear that QDOS was not simply a copy of CP/M. They ran on different
23 computers (CP/M on the eight-bit 8080 and QDOS on the sixteen-bit 8086)
which had substantially different internal workings and instruction sets. In fact,
it should have been clear to the defendants that having CP/M run on an 8086
could not be done by simply copying it as in the two examples above, or even
by a simple translation from the 8080 instructions to those of the 8086. After
all, they write that "Seattle Computer Products (SCP), was impatient for the
CP/M-86 Kildall was developing for the more powerful 8086 Intel chip."
indicating that it was not a trivial task for even the original developer of CP/M
who possessed all its source code.

24 29. To further equate the acts of the "cloners" (actually copiers) with those of Mr.
25 Paterson, the defendants go from the paragraph above to the description of the
26 development of QDOS by saying "Another participant in these little morality
27 plays was Rod Brock, a neighbor of Bill Gates's in Redmond. Brock, who

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1 owned a small company called Seattle Computer Products (SCP) ... Brock's
2 revenues were running down, so he hired Tim Paterson to fill the gap."

3 30. The defendants then quote Kildall as saying "Paterson's Seattle DOS was yet
4 another one of the rip-offs of the CP/M design." This continues their equating
5 of the development of QDOS with the copiers described above.

6 31. The defendants also indicate that they felt that something illegal or shameful
7 occurred in the development of QDOS, because the paragraph following their
8 brief discussion of QDOS, they state "This would have all been a bagatelle,
9 soon disposed of by lawsuit or shame, ..."

10 THE LEGALITY OF QDOS

11 32. On page 410 of the Book, the defendants use a quote from John Wharton and
12 say that it "neatly sums up the ethics" of Paterson's activities:

13 But for Mr. Paterson to cite the unavailability of CP/M-86 as
14 justification for appropriating the 'look and feel' of a competing
15 operating system and its utilities seems to me analogous to telling a
16 judge, 'I needed the car, Your Honor, and the plaintiff wouldn't sell me
17 his, so I was forced to take it.'"

18 33. That analogy, while it might fit the two examples the defendants used for
19 "cloners" before discussing the development of QDOS, it is clearly wrong with
20 respect to Paterson's activities. But it is a poor analogy even when applied to
21 those who were copying CP/M for their own use, since unlike the taking of a
22 physical object like a car, the copying did not deprive Kildall of his ability to
23 continue to sell CP/M, it just provided competition that was free-riding because
they had done no independent work in creating their "clone."

34. A better analogy would be:

The familiar "figure-H" pattern of an automobile stick is chosen
arbitrarily by an auto manufacturer. Use of the same pattern might be
socially desirable, as it would reduce the retraining of drivers.

35. That analogy comes from *Synercom Technology v. University Computing*,
decided on August 24, 1978 by the District Court for the Northern District of
Texas (462 F.Supp. 1003), which concluded that "copyright protects copying of
the particular expressions of the pattern, and does not prohibit another
manufacturer from marketing a car using the same pattern."

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1 36. In order to allow users of Synercom's building structure analysis program to
2 easily move to the new system developed by Engineering Dynamics (EDI) and
3 marketed by University Computing, the developers who were familiar with
4 Synercom's program decided to use the same input card format. Judge
5 Higginbotham found that the use of Synercom's input card formats was not a
6 copyright infringement.

7 EDI's preparation of a FORTRAN preprocessor program from the
8 descriptions contained in the manuals cannot constitute an infringing
9 derivative use provided this was done without copying of the plaintiff's
10 FORTRAN program, and it was.

11 37. The similarities between this 1978 decision and Paterson's activities in 1980
12 developing QDOS are striking. As with EDI, Paterson prepared his program
13 from descriptions contained in the CP/M manuals. As with EDI, his program
14 was not a copy of CP/M.

15 38. In its landmark 1992 decision on computer program copyrights, *Computer*
16 *Associates v. Altai* (982 F.2d 693), the Second Circuit cited *Synercom* with
17 approval and indicated that when determining whether there is copyright
18 infringement in a computer program, one must filter out those elements that are
19 "dictated by external factors." They based this on the *scenes a faire* doctrine,
20 well-established at the time of the development of QDOS, that says that stock
21 incidents or settings that are standard for a topic or expressing a concept are not
22 protected by copyright law.

23 39. Moreover, Section 102(b) of the Copyright Act of 1976 states that:

In no case does copyright protection for an original work of authorship
extend to any idea, procedure, process, system, method of operation,
concept, principle, or discovery, regardless of the form in which it is
described, explained, illustrated, or embodied in such work.

40. Extending copyright protection to cover any implementation of a particular API
would be an impermissible protection of the idea expressed in the API and the
process or system used to perform the function of the API.

41. Had Digital Research wanted to protect the procedures used by CP/M, the
proper route would have been through patent rather than copyright. Although

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1 not common at the time, patents on software techniques had been issued well
2 before the creation of CP/M, and yet the only patent issued to Mr. Kildall is a
3 design patent on an "image magnifier for computer displays." Attempting to
4 claim copyright for the API of CP/M would essentially give patent-like
5 protection without having to meet the patent requirements of novelty and
nonobviousness, and is clearly against public policy.

6 42. In my opinion, under copyright law at the time of the development of QDOS in
7 1980, the activities of Mr. Paterson would not be an infringement of the CP/M
8 copyrights. That remains true to this day.

8 SUBJECTING KILDALL'S WORK TO THE SAME STANDARDS

9 43. The defendants, after all their criticism of the activities of Mr. Paterson, have
10 clearly not applied the same standards to Mr. Kildall's work. Had they done
11 that, they would not have been able to support the thesis of the chapter.

12 44. As mentioned above, what they describe as "the heart of [Kildall's]
13 innovation," the use of an interrupt (in the case of QDOS) or subroutine call to
14 a specified location (in the case of CP/M) was common to the operating
15 systems that Kildall used before and during his development of CP/M.

16 45. The Book says that Kildall used a DEC PDP-10 installed at the Naval
17 Postgraduate School, where he was an instructor at the time he was developing
18 CP/M. On page 406 of the Book, it states that after problems get a disk drive to
19 work on his microcomputer, "He went reluctantly back to his DEC
20 minicomputer and built an operating system he called CP/M." In doing so, he
21 borrowed extensively from the software supplied by Digital Equipment
22 Corporation (DEC) as part of the PDP-10 system. Kildall played no role in the
23 development of that operating system.

24 46. CP/M's "DDT" debugger that they mentioned was based on a DEC-supplied
25 program by the same name. The program was initially developed at MIT in the
26 early 1960's, where its name originally stood for "DEC Debugging Tape." DEC
27 implemented a version for the PDP-10 and included it with the operating
28 system they supplied. While there are differences in the commands between the

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1 PDP-10 and CP/M DDT because of the differences in the machine architectures
2 and operating system structure, it is clear that CP/M's DDT was heavily
3 influenced by the earlier program.

4 47. The defendants cite the use of "A>" as a prompt in QDOS as compared to "A:"
5 in CP/M as further indication of "blatant" copying, with "some slight
6 alterations." But the use of a colon following a device name (in this case, the
7 name for the first disk drive "A") is also taken from the PDP-10 operating
8 system. In fact, many of the device names in CP/M are simply taken from the
9 PDP-10 operating system.

10 48. The PDP-10 operating system also used file names in the form of a name
11 followed by a period followed by an extension of up to three characters to
12 indicate the type of file. Although CP/M increased the possible file name length
13 from six characters to eight, it is clear that the form of a file name in CP/M
14 came from the PDP-10 operating system.

15 49. The use in CP/M of an asterisk to indicate matching any filename or extension
16 and of a question mark to indicate matching any character in that position in a
17 filename or extension is also taken from the PDP-10 operating system.

18 50. One thing that was not used in QDOS from CP/M is the command used to copy
19 a file. In QDOS (and MS-DOS), the command to make a copy of file A and call
20 it B is "COPY A B". In CP/M, the command is much more mysterious: "PIP
21 B=A". But the mystery is solved when one looks at the documentation for the
22 PDP-10 operating system. "PIP" is that operating system's "peripheral
23 interchange program" and its commands are in the form of
"destination=source".

51. None of this should be surprising. Adopting commands and naming
conventions from the DEC-supplied PDP-10 operating system that Kildall was
using at the time he developed CP/M made it easier for him to go back-and-
forth between the two systems. But it was done primarily for his convenience,
not to allow developers to move their applications to a new operating system.

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1 52. Paterson found it necessary to use aspects of CP/M so that translation of CP/M
2 application programs to QDOS was possible. If he had changed the numbers for
3 the operating system function calls, or the format of the file control block, or
4 the ending delimiter for a string to be written to the console, it would have
5 made it exceeding difficult for developers of CP/M applications to move them
6 to QDOS.

6 53. In my opinion, had the defendants applied the same standards to Mr. Kildall's
7 work in developing CP/M than they applied to Mr. Paterson's work in
8 developing QDOS, they would have seen that they were unfairly characterizing
9 Mr. Paterson's activities as illegal, immoral, or shameful.

9 I declare under the penalty of perjury that the foregoing is true and correct.

11 
12 Lee A. Hollaar

13 Executed at Salt Lake City, Utah on April 11, 2007.

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Lee A. Hollaar
(As of April 2007)

Born: March 9, 1947, Litchfield, Minnesota

Education

Ph.D., Computer Science, University of Illinois, 1975
M.S., Computer Science, University of Illinois, 1974
B.S., Electrical Engineering, Illinois Institute of Technology, 1969
Nonmatriculated student, University of Utah College of Law, 1989-1993

Employment

June 1986 to present. University of Utah. Professor of Computer Science
June 1996 to December 1997, United States Court of Appeals for the Federal Circuit,
Visiting Scholar
January 1997 to August 1997, United States Senate Committee on the Judiciary,
Committee Fellow
July 1983 to September 1984, July 1985 to June 1986, July 1989 to June 1991.
University of Utah. Associate Chairman, Department of Computer Science
August 1986 to June 1992. University of Utah. Director of Campus Networking
July 1987 to June 1991. University of Utah. Research Professor of Electrical Engineering
October 1983 to September 1995. Contexture, Inc. Founder and President
August 1980 to June 1986. University of Utah. Associate Professor of Computer Science
February 1986 to July 1987. University of Utah. Research Associate Professor of
Electrical Engineering
June 1978 to August 1980. University of Illinois at Urbana-Champaign. Assistant
Professor of Computer Science and Senior Research Engineer, Computing Services
Office
September 1975 to June 1978. University of Illinois. Visiting Research Assistant
Professor, Department of Computer Science and Aviation Research Laboratory
February 1970 to August 1975. University of Illinois. Graduate research assistant in
Computer Science
February 1969 to May 1974. Datalogics, Inc., Chicago. Systems Engineer and
Coordinator of Engineering
August 1967 to July 1969. First National Bank of Chicago. Senior Systems Programmer

Professional Societies

Institute for Electrical and Electronics Engineers, Senior Member
Association for Computing Machinery, Member
National Association of Patent Practitioners, Founding Member
American Intellectual Property Law Association, Patent Agent Affiliate Member

Professional Activities

Registered Patent Agent, United States Patent and Trademark Office, 1989 to present

Lee A. Hollaar

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Chair, Intellectual Property Committee, IEEE-USA, 2001-2002; vice chair, 1998-2000
IEEE-USA liaison to AAAS Court Appointed Scientific Experts Project, 2000 to present
Advisory board member, Bureau of National Affairs Expert Evidence Report, 2001 to
present
Member of Utah Digital Signature Legislative Facilitation Committee, 1994-95;
Implementation Committee, 1995-1997
Professional Engineer (Control Systems), California, 1977 to 1997.
Member of the State Networking Committee, under the Utah State Advisory Council on
Science and Technology, 1989
Vice-Chairman of SIGIR, ACM's Special Interest Group for Information Retrieval,
1985-87
Member of the Model Curriculum Committee of the Educational Activities Board of the
IEEE Computer Society, 1982-83
Designated Engineering Representative (Systems and Equipment), Federal Aviation
Administration, Great Lakes Region, 1975-80
Workshop participant and reviewer, Office of Technology Assessment study "Finding a
Balance: Computer Software, Intellectual Property and the Challenge of
Technological Change," 1992
Advisory Panel member and workshop participant, Office of Technology Assessment
study "Information Privacy and Security in Network Environments," 1994
Referee for National Science Foundation and many journals, conferences, and
workshops

Other Activities

Commercial Pilot, Single- and Multi-Engine Airplane and Free Balloon; Ground
Instructor, Advanced and Instrument. Private and Commercial Pilot Examiner, Hot
Air Balloon, 1976-80. Former Flight Instructor, Instrument and Single- and
Multi-Engine Airplane.

Honors

Elected to membership in Sigma Xi (research), Eta Kappa Nu (Electrical Engineering),
and Phi Kappa Phi (scholastic)
Included on the list of Teachers Ranked as Excellent by their Students, University of
Illinois, 1978
Nominated for Engineering College Outstanding Teacher by Department of Computer
Science, 1983
Distinguished Visitor, IEEE Computer Society, 1985-87

Publications: Books

Legal Protection of Digital Information, BNA Books, 2002

Publications: Chapters in Books

- "Unconventional Computer Architectures for Information Retrieval" in Annual Review of Information Science and Technology (Martha Williams, editor), Volume 14, 1979
- "The Architecture and Operation of a Large, Full-Text Information Retrieval System" (with Kent Smith, Wing Hong Chow, Roger Haskin, and Perry Emrath), International Workshop on Database Machines, August 1982; Chapter 9 in Advanced Database Machine Architecture, Prentice-Hall, 1983
- "The Utah Text Retrieval Project -- A Status Report," Third Joint BCS/ACM Symposium, King's College, Cambridge, July 1984; Chapter 8 in Research and Development in Information Retrieval, C. J. van Rijsbergen, editor, Cambridge University Press, 1984
- "The Utah Text Search Engine: Implementation Experiences and Future Plans" in Fourth International Workshop on Database Machines, March 1985; proceedings published by Springer-Verlag, 1985
- "Special-Purpose Hardware for Information Retrieval," in Information Retrieval: Data Structures and Algorithms, William Frakes and Ricardo Baeza-Yates, editors, Prentice-Hall, 1992
- "Text Databases and Information Retrieval" (principal author Ellen Riloff), in *CRC Handbook of Computer Science and Engineering*, 1996

Publications: Refereed Journals

- "Specialized Merge Processor Networks for Combining Sorted Lists," *ACM Transactions on Database Systems*, September 1978
- "Text Retrieval Computers," *Computer*, March 1979
- "A Design for a List Merging Network," *IEEE Transactions on Computers*, June 1979
- "Alternative Approach to Multi-Sensor Navigation" (with Michael J. Cannon), *AIAA Journal of Guidance and Control*, September 1980
- "Direct Implementation of Asynchronous Control Units," *IEEE Transactions on Computers*, December 1982
- "Operational Characteristics of a Hardware Pattern Matcher" (with Roger Haskin), *ACM Transactions on Database Systems*, March 1983
- "The Utah Text Retrieval Project," *Information Technology: Research and Development* (Buttersworths, Kent, England), October 1983
- "Special-Purpose Hardware for Text Searching: Past Experience, Future Potential," *Information Processing & Management*, Volume 27, Number 4, 1991. (An early version of this paper also appeared in *IEEE Data Engineering Bulletin*, March 1990)
- "Justice Douglas Was Right: The Need for Congressional Action on Software Patents," *AIPLA Quarterly Journal*, Winter 1996
- "Co-Teaching Engineering and Writing: Learning about Programming, Teamwork, and Communications," (with Louise Rehling), *Issues in Integrative Studies*, 1997

Publications: Other Journals

- "Software Patents," book review in *IEEE Computer*, December 1995

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- "Legal Recognition of Digital Signatures" (with Alan Asay), sidebar article in Special Issue on Public Key Cryptology, *IEEE Micro*, June 1996
- "Text Databases and Information Retrieval" (principal author: Ellen Riloff), *Computing Surveys*, 1996
- "Now That the CDA's History, Let's Plan Anew," *The National Law Journal*, July 14, 1997
- "Computer Antitrust Litigation: A Technologically Sound Legal Opinion Requires Judicial Reliance on Technical Experts," *BNA Expert Evidence Report*, October 2001
- "Requesting and Examining Computer Source Code," *BNA Expert Evidence Report*, May 10, 2004
- "Liability for Inducement of Copyright Infringement" The Genie is Out of the Bottle," *Journal of Internet Law*, September 2004
- "The Use of Neutral Experts," *BNA Expert Evidence Report*, December 20, 2004
- "A New Look at Patent Reform," *Journal of the Patent and Trademark Office Society*, September 2005
- "Patents 2.0: A new type of patent is needed," *IEEE Spectrum*, February 2006
- "The Form of a Software Claim Makes a Big Difference," *BNA Patent, Trademark & Copyright Journal*, November 2006

Publications: Refereed Conferences

- "A Specialized Architecture for Textual Information Retrieval" (with William H. Stallhorn), National Computer Conference, June 1977
- "Multi-System Position Determination" (with Michael J. Cannon), AIAA/IEEE Second Digital Avionics Systems Conference, November 1977
- "Rotating Memory Processors for the Matching of Complex Textual Patterns," Fifth Annual Symposium on Computer Architecture, April 1978
- "Current Research into Specialized Processors for Text Information Retrieval" (with David C. Roberts), Fourth International Conference on Very Large Databases, August 1978
- "Hardware Systems for Text Information Retrieval," ACM SIGIR Conference, June 1983
- "The Implementation of a Radix-16 Digit-slice Using a Cellular VLSI Technique" (with Tony M. Carter), IEEE International Conference on Computer Design/VLSI in Computers, October 1983
- "On the Testability of the Direct Implementation of Asynchronous Circuits" (with Tao Li), Conference on Advanced Research in VLSI, Massachusetts Institute of Technology, January 1984
- "A Message-Based Information Handling System" (with Shane Robison and Michael Zeleznik), IEEE Comcon, February 1984
- "The Structure and Operation of a Relational Database System in a Cell-Oriented Integrated Circuit Design System" (with Tony Carter, Brent Nelson, and Raymond Lorie), Design Automation Workshop, June 1984
- "A Testbed for Information Retrieval Research: The Utah Retrieval System Architecture," Eighth Annual International ACM SIGIR Conference, Montreal, June 1985
- "A Distributed Information Handling System," ACM Annual Conference, Denver, October 1985

Lee A. Hollaar

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- "A Workstation-Based Approach to Text Retrieval and Manipulation," First International Conference on Computer Workstations, San Jose, November 1985
- "The Utah Retrieval System Architecture," RIAO 88, Massachusetts Institute of Technology, March 1988
- "Implementation and Evaluation of a Parallel Text Search for Very Large Text Databases," HICSS-25 (Hawaii International Conference on System Sciences), January 1992

Publications: Other Conferences

- "Can Low-Cost VOR and Omega Receivers Suffice for RNAV?" ION National Aerospace Meeting, April 1978
- "Statement for the Session on Impact of New Technologies" in Issues in Data Base Management (H. Weber and A. I. Wasserman, eds.), North Holland Publishing, 1979.
- "Innovative Architectures for Retrieval Systems," National Online Information Meeting, March 1980
- "Design Considerations of a Campus-wide Building Control System," Fall 1980 Educom Conference Proceedings
- "Specialized Hardware for Implementing Full Text Retrieval Systems," American Chemical Society National Meeting, April 1982
- "The Utah Search Engine," American Society for Information Science Annual Meeting, October 1985
- "The Role of Intellectual Property in Open Source Software," IPI Conference on Strategies for Building Software Industries in Developing Countries, May 19, 2004

Publications: Patents and Applications

- "Method and System for Matching Encoded Characters" (with Roger Haskin), United States Patent 4,450,520, issued May 22, 1984
- "Method for Error Recovery in a Digital Data Communications System," United States Patent 5,396,613, issued March 7, 1995
- "Quotation Highlighting in a Hypertext System," United States Patent 7,028,04, issued April 11, 2006
- "Electrical Energy Monitoring System," (with Aaron Myer), provisional patent application filed October 2006

Publications: Briefs

- Amicus brief filed with the United States Court of Appeals for the District of Columbia Circuit in *United States v. Microsoft*, December 2000
- Amicus brief filed with the Supreme Court of the United States in *MGM v. Grokster*, January 2005 (Court adopted the theory of the brief)
- Amicus brief filed with the Supreme Court of the United States in *KSR v. Teleflex*, August 2006

Publications: Online Only

"*Sony Revisited: A new look at contributory copyright infringement*"

<http://digital-law-online.info/papers/lah/sony-revisited.htm>

"Unclear and Unconvincing: How a misunderstanding led to the heightened evidentiary requirement in patent litigation" (with John Knight)

<http://digital-law-online.info/papers/jk/unclear.htm>

Publications: Policy Papers

"A Bad Trade: Will Congress Unwittingly Repeal the Digital Millennium Copyright Act and Violate Our Trade Treaties?," Issue/Brief, Institute for Policy Innovation, June 2006

Publications: Letters to Editor

"When Is Copyright Infringement Legal?," letter in Forum, *Communications of the ACM*, June 2004

"Attack on Proposed Induce Act Ignores Long-Standing Element of Copyright Law,"

letter in *Legal Times*, November 1, 2004

Letter to the Editor, *Journal of the Patent and Trademark Office Society*, January 2005

"Which Use Is Fair in Digital Rights Management?," letter in Forum, *Communications of the ACM*, September 2005

Publications: Other

"A Programmably Loadable Control Store for the Burroughs D-Machine." M.S. Thesis, May 1974 (David Kuck, advisor)

"A List Merging Processor for Inverted File Information Retrieval Systems." Ph.D. Thesis, October 1975 (David Kuck, advisor)

"EXCEL, Experiments in Computer Electronics and Logic, Fifth Edition," Text for logic design laboratory at the University of Illinois Department of Computer Science, 1980 (with Michael Faiman)

"The Design of an Extensible Communications-Based Full Text Information Retrieval System" (with Shane Robison and Michael Zeleznik). Final report for Contract 82F765800, "Development of Algorithms and Evaluation of Performance for Information Retrieval Systems", revised February 1984

"Filesharing Programs and Technological Features to Induce Users to Share," a report to the United States Patent and Trademark Office from the Office of International Relations (Thomas D. Sydnor II, principal author, also with John Knight), March 2007

Research Grants and Contracts

Legal Protection of Digital Information. Sponsorship gifts from Summit Law Group (\$75,000), Lineo (\$25,000), and the Bureau of National Affairs (subscriptions), 2000-present; gift in 2004 of \$255,000.

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Hardware and software systems for the retrieval and handling of text. This work includes the development of special purpose backend processors, particularly a high-speed text search engine implemented in custom VLSI, and the design and implementation of a distributed software architecture for text handling.

"Implementation and Evaluation of a Parallel Text Searcher for Very Large Databases," National Science Foundation's Experimental Systems Program, MIP-9023174, 9-91 through 6-97, \$1,923,462

"Continued Analysis and Development of Specialized Backend Processors for Very Large Text Databases," National Science Foundation, MCS-7825872 (University of Illinois), 5-79 to 8-80, \$90,279; MCS-8021116 (University of Utah), 8-80 to 2-82, \$44,969; MCS-8021116A01, 3-82 to 5-85, \$104,559; MCS-8021116A02, 6-83 to 8-84, \$32,977; DCR-8503663, 6-85 to 5-88, \$156,864

"Implementation of a Production-Quality Workstation-Based Information Retrieval System," Federal contract 86F224000, 6-86 to 7-87, \$391,653

"Development of Algorithms and Evaluation of Performance for Information Retrieval Systems," Federal contract 82F765800, 6-82 to 7-83, \$147,190; 8-83 to 3-84, \$175,000; 3-84 to 10-84, \$183,032; 11-84 to 10-85, \$213,917; 11-85 to 5-86, \$55,119

"Support and Enhancement of the URSA Retrieval System," Federal contract 88-N620200-000, 6-88 to 3-89, \$102,795 (through Contexture, Inc.)

"Porting of the URSA Retrieval System to Other Workstations," Federal contract, 9-89 to 3-90, \$35,000 (through Contexture, Inc.)

Development grant from Digital Equipment Corporation, 5-83, \$12,038

Equipment grant from Sun Microsystems, Inc., 7-92, \$25,000

Design methods and tools for VLSI circuits. This includes the development of a direct mapping technique for asynchronous circuits and the specification of relational database extensions for the efficient handling of cell-based designs.

"Asynchronous Control for VLSI Circuits: Methods for Automated Design and Testing using a Direct Mapping Technique," National Science Foundation, ECS-81-16742, 3-82 to 8-84, \$68,737

"Computer Aided Design" (principal investigator: R. F. Riesenfeld), National Science Foundation MCS-81-21750, 10-82 to 9-87, \$2,853,262 plus \$500,000 university matching funds

"Joint Study of the Requirements for a Database Management System for Computer Aided Design," IBM San Jose Research Laboratory, 12-82 to 6-83, \$34,700; 4-84 to 9-84 (with Tony Carter), \$49,987

Other research support:

"Digital Signatures for Clinical Laboratory Documentation Management and Information Dissemination" (Jeffrey Smith, M.D., co-principal investigator), University of Utah, 7-98 to 6-99, \$34,000

"A Real-Time Computer and Graphics Laboratory," National Science Foundation, MCS-81-05757, 4-81 to 4-82, \$145,000

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"Avionics Systems Analysis," NASA Langley Research Center, NAS1-15145, 12-77 to 9-78, \$9,001

"Shared Memory Multi-Processor Study," IBM General Systems Division, GSD-210019, 11-79 to 11-82, \$217,200 plus \$250,000 in furnished equipment (University of Illinois, co-principal investigator, participation ended 9-80)

Laboratory Development Funds from University of Utah, 8-80, \$40,000

Research Development Funds: Versatec to ComputerVision Interface, Kistler Glass Fund, University of Utah, 4-81, \$2,000

Equipment gift from Data I/O Corporation, 9-84, \$8,275

Students Supervised (Doctoral)

Rhon L. Williams (Electrical Engineering, 1978), "A Multiprocessor System for the Direct Execution of Lisp"

Michael J. Cannon (Computer Science, 1979), "A New Approach to Multi-Sensor Navigation System Design"

Roger L. Haskin (Computer Science, 1980), "Hardware for Searching Very Large Text Databases"

Hui-Ming Huang (Computer Science, 1980), "On the Design and Scheduling of an Index Processing System for Very Large Databases"

Tao Li (Computer Science, 1985), "Fault Diagnosis and Design-for-Testability for Integrated Sequential Circuits" (co-advisor with Kent F. Smith)

Mamdouh H. Ibrahim (Computer Science, 1987), "Database Loading by Example: A Learning Approach to Loading Information Retrieval Databases"

Robert N. Elens (Computer Science, 1990), "Sequencing Computational Events in Heterogeneous Distributed Systems"

Michael P. Zeleznik (Computer Science, 1993), "Security Design in Distributed Computing Applications"

Students Supervised (Master's)

Paul Stoecker (Electrical Engineering, 1976), "VOR-VOR Area Navigation" (co-advisor)

Dean Johnson (Electrical Engineering, 1976), "A Two Channel Moving Head Parallel Access Disk Memory System" (co-advisor)

Roger Haskin (Computer Science, 1978), "On Aircraft Predictor Display Systems"

Katherine Harper (Computer Science, 1980), "An Evaluation of Path Pascal as a Discrete Event Simulation Language"

Tony Carter (Computer Science, 1982), "ASSASSIN: An Assembly, Specification and Analysis System for Speed-Independent Control-Unit Design in Integrated Circuits Using Path-Programmable Logic (PPL)" (co-advisor)

Robert C. Pendleton (Computer Science, 1985), "Simulation Analysis of a Large Textual Database Search System"

Ellen S. Gibson (Computer Science, 1984), "An Extensible and Flexible Query Language for an Information Retrieval System"

Kenneth S. Stevens (Computer Science, 1984), "The Soft Controller: A Self-Timed Microsequencer for Distributed Parallel Architectures" (co-advisor)

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- Forrest B. Pickett (Computer Science, 1984), "A Self-Timed Cell Set and Library for the Design of Integrated Circuits" (co-advisor)
- Michael P. Zeleznik (Computer Science, 1985), "A Portable, Net-Transparent Communication System for Distributed, Message-based Applications"
- David J. Schlegel (Computer Science, 1985), "A Portable Window Manager for a Message-based, Distributed System"
- Koah-Hsing Wang (Computer Science, 1985), "Performance Monitoring and Projection for an Information Retrieval System"
- Walter O. Haas (Computer Science, 1985), "Design of a Gateway Between a Public Data Network and an Ethernet Using TCP/IP"
- Cliff J. Anderson (Computer Science, 1986), "Automated Routing Tools for the PPL Design Methodology" (co-advisor)
- James Schimpf (Computer Science, 1987), "Realization of a PFSA Based Search Machine"
- Nancy Orr (Computer Science, 1988), "A Method for Evaluation of Graphics Coprocessors for Personal Computers"
- Jeffrey K. Smith (M.S., Computer Science, 1991), "Seqwarp: A Low-Cost Systolic Array for Biological Sequence Comparison"
- Robin Roberts (M.E., Computer Science, 1993)
- James Roberts (M.E., Computer Science, 1993)
- Mark (Bassam) Salem (Computer Science, 1995), "An Object-Based Communications Framework for the Development of Distributed Systems"
- Lisa Letellier (Computer Science, 1997), "Managing Information in a Distributed Information Retrieval System"
- Baocai Zhang (M.E., Computer Science, 1998)

Classes Taught

University of Utah:

- CS 5480/6480, Data Communications, Fall 1998, Fall 1999, Fall 2001, Fall 2003
- CS 2960, Introduction to Computer Networking, Spring 2001
- CS 0396/3960/5960, Introduction to Networks, Fall 2004
- CS 5060, Legal Protection of Digital Information, Fall 2000, Fall 2002, Fall 2004 (taught as CS 6960), Fall 2006 (taught as CS 5960/6960)
- CS 0962/5962, Special Topics: Legal Protection of Computer Software, Fall 1998, Fall 1999
- CS 5940/6940, Seminar on Law in a Digital World, Spring 2003
- CS 5964, Special Topics: Electronic Commerce, Spring 1999
- CS 5966, Special Topics: Social Aspects of a Digital World, Spring 2000
- CS 321, Introduction to Logic Design, Autumn 1981 and 1982
- CS 322, Introduction to Computer Architecture, Winter 1982, 1983, 1984
- CS 323, Advanced Logic Design, Spring 1982 and 1983
- CS 410, Low Level Programming, Autumn 1980
- CS 451-452-453, Senior Project Laboratory, 1989-90, 1990-91, 1991-92, 1992-93, 1993-94, and 1994-95 academic years (writing-intensive course)
- CS 506, Operating Systems, Spring 1981, 1982, 1984, 1985, 1986, and Autumn 1988 [formerly CS 536]
- CS 508, Data Communications Systems, Winter 1982, Spring 1983, Winter 1984 and 1985 (with R. L. Frank), Autumn 1986, Spring 1987 (with David Hanscom), Winter 1998 [formerly CS 571 (Topics in Computer Science) and CS 525]
- CS 578, Special Topics: Advanced Networking, Spring 1998
- CS 57X, Topics in Computer Science (Information Retrieval), Autumn 1984
- CS 57X, Topics in Computer Science (Text Retrieval Seminar), Winter and Spring 1992, Fall and Winter 1993
- CS 57X, Topics in Computer Science (Computers, Ethics, and the Law), Winter 1984 (with James Jensen, Esq.), Winter 1986, Winter 1989, Spring 1991, Winter 1993, Spring 1993
- CS 579, Legal Protection of Computer Software, Autumn 1995, Winter 1995, Winter 1998
- CS 592, Asynchronous Circuits, Autumn 1981 (with A. L. Davis)
- CS 628, Organization of Computing Systems, Autumn 1980 (with A. L. Davis and E. I. Organick)
- CS 638, Database Systems, Autumn 1983 and 1984
- CS 679, Computer Intellectual Property Law, Winter 1994, Winter 1995, Spring 1998
- CS 679, Computer Law (for law students), Spring Semester 1996
- CS 68X, URSA Seminar, 1991-92, 1992-93, 1993-94, Winter 1995
- CS 685, Text Retrieval Seminar (with Ellen Riloff), Autumn 1994
- CS 689, Database Machine Seminar, Winter and Spring 1983
- Introduction to Copyright Law, continuing legal education seminar sponsored by the Division of Continuing Education and the Utah State Bar, October 1995

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University of Illinois:

CS 264/265, Introduction to the Structure and Logic of Digital Computers, Spring 1979, Fall 1979, Spring 1980
CS 360, Scientific Applications of Minicomputers, Fall 1978
CS 397, Seminar on Avionics Systems, Spring 1976
Initiated CS/EE 337, Control Structure of Computers, with Prof. James E. Robertson, as a graduate student

Academic Committees

University ad hoc Committee on Export Regulations, 2003
University Technology Transfer Advisory Committee (formerly Patent Review Committee), 1984-86, 1988-91, 1992-96 (Chair, 1993-96), 1999-2001 (Chair, 2000-2001)
University Legal Counsel Advisory Committee, 1999-2003
University Academic Senate, 2001
University Digital Signature Committee, 1999-2001
University Senate Electronic University Advisory Committee, 1997-2001
University Studies Committee, 1999
University Writing Program Board, 1995-1997
University Academic Policy Advisory Committee, 1995-1997
University Library Policy Advisory Committee, 1995-1997
University Network Access Advisory Committee, 1993-1997
University Database Coordination Subcommittee, 1994-1997
University Ad-Hoc Committee on Intellectual Property Policy, 1995-1996
University Senate Budget and Planning Committee, 1992-94
University Research Committee, 1991-94
University Fiber Advisory Committee, 1992-94
University Committee on Instructional Communication Initiatives, 1989-92
University Computer Task Force. 1988-92
University ad hoc Committee on Patent and Software Policy, 1989-91
University Computer Facilities Planning Committee, 1981-84
University Computer Center Advisory Committee, 1985-86
University Copyright Policy Committee, 1982-83
University Library Expansion Committee, 1982-83
University Ad-hoc Committee on Computer Networking, 1985
Graduate Council Marriott Library Review Committee, 1985
Utah Resource for Genetic and Epidemiologic Research Faculty Advisory Committee, 1987-92
Engineering College Council, 1999-2001 (Chair pro tem, 1999-2000; chair, 2000-01)
Engineering College Review, Promotion, and Tenure Committee, 1983-85
Engineering College Curriculum Committee, 1982-83
Engineering College Senate Nominating Committee, 1980-85
Engineering College Dean Search Committee, 1983
Dean's Advisory Committee on New Programs and Innovation, 1984-86
Department Colloquium Committee (Chair), 1980-81

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Department Curriculum Committee (Chair), 1981–85

Department Computer Policy Committee (Chair), 1981–85, 1989, 1999–2000

Department Undergraduate Committee (Chair), 1982–1984

Case History for Prof. Lee A. Hollaar

As of April 2007

Active Current Cases

Papyrus Technology Corporation v. New York Stock Exchange, Inc., United States District Court, Southern District of New York, Civil No. 04 CV 00625

Expert for plaintiff

Deposition testimony: April 6, 2005

Park City Group, Inc., v. Workbrain, Inc. United States District Court, District of Utah, Central Division, Civil No. 2:06cv00289 DB

Consultant to plaintiff

Paterson v. Little Brown et al., United States District Court, Western District of Washington, Civil No. C05-1719TSZ

Expert for plaintiff

Inactive Current Cases

Brookhaven Typesetting Services, Inc. v. Adobe Systems, Inc., United States District Court, Northern District of California, Civil No. C01-20813 RMW

Consultant to plaintiff

Integrated Solutions International, LLC v. Velocitor Solutions, LLC, et al., Forsyth County North Carolina Case No. 04-CVS-2883

Consultant to defendant

Symbility Solutions, Inc. v. Xactware, Inc., United States District Court, Eastern District of Michigan, Civil No. 2:05 CV 73068

Consultant for defendant

Past Cases

- Altiris, Inc. v. Innovative Software, et al.*, United States District Court, District of Utah, Central Division, Civil No. 2:99CV0013K
Expert for plaintiff
- Altiris, Inc. v. Symantec Corp.*, United States District Court, District of Utah, Central Division, Civil No. 2:99CV0013K
Expert for plaintiff
Expert report provided
Deposition testimony: June 12, 2001
Markman hearing testimony: July 17, 2001
- Be Incorporated v. Microsoft Corporation*, United States District Court, District of Maryland, Civil No. JFM-02-2738, MDL Docket No. 1332
Consultant to plaintiff
- Bionic Buffalo, Inc. v. Integrated Systems, Inc., and Wind River Systems, Inc.*, American Arbitration Association, Case No. 79 117 00112 99 SIR
Arbitrator (three member panel)
Decision pending for payment of arbitration fees
- Brigham Young University v. SoftSolutions, Inc.*, private arbitration
Expert for petitioner
Hearing testimony: September 27, 1995
- Bristol Technology v. Microsoft Corporation*,. United States District Court, District of Connecticut, Civil No. 398 CV 1657 (JCH)
Expert for plaintiff
Expert report provided
Deposition testimony: April 27, 1999
Trial testimony: June 16, 1999, and June 21, 1999
- Caldera, Inc. v. Microsoft Corporation*, United States District Court, District of Utah, Central Division, Civil No. 2:96CV645B
Expert for plaintiff
Expert report provided
Deposition testimony: December 18, 1998, and August 4, 1999
- Code Zebra, Inc. v. Microsoft Corporation*, United States District Court, District of Utah, Civil No. 2:02CV0054
Expert for plaintiff

Compuware Corproation v. International Business Machines Corporation, United States District Court, Eastern District of Michigan, Civil No. 02-70906
Special Master for patent claim construction

Etoolz, Inc. v. Doctor's Signature Sales & Marketing, Inc., United States District Court, District of Utah, Civil No. 2:00CV0175
Expert for defendant

F & G Scrolling Mouse v. Microsoft, Honeywell, and KeyTronic, United States District Court, Western District of Washington at Seattle, Civil No. C99-995C
Expert for plaintiff
Expert report provided
Deposition testimony: October 4, 2000

Firstnotebook.com, Inc. v. Dino Capone, et al., Circuit Court for the 17th Judicial Circuit in and for Broward County, Florida, Civil No. 0311036
Court-appointed expert
Expert report provided

Iomedics, Inc. v. National School Fitness Foundation, American Arbitration Association, Case No. 77 Y 117 00310 03 JISI,
Joint expert
Informal report provided by email

I-Tech Corp. v. Data Transit Corp., United States District Court, District of Minnesota, Civil No. 02-CV2765 (RHK/AJB)
Expert for defendant

Intouch Group v. Amazon.com, et al., United Sates District Court for the Northern District of California, Civil No. C 00 1156 DLJ
Expert for plaintiff

Iomega Corporation v. Castlewood Systems, Inc., United States District Court, District of Utah, Central Division, Civil No. 1:99CV00080B
Expert for defendant
Expert reports provided
Deposition testimony: December 5, 2001

Jason Associates Corporation v. Digitran, Inc., United States District Court, District of Utah, Civil No. 1:00CV00092J
Expert for plaintiff

Netscape Communications Corp. v. Microsoft Corp., United States District Court, District of Maryland, Civil No. JFM-02-2090, MDL Docket No. 1332
Expert for plaintiff

Overstock.com, Inc. v. NCR Corproation, United States District Court, District of Utah, Civil No. 203-CV-0123 PGC
Expert for plaintiff

Phonex Corporation v. Elcom Technologies Corporation, United States District Court, District of Utah, Central Division, Civil No. 2:95-CV-1038B
Consultant to plaintiff

Phonex Corporation v. Telegen Corporation, United States District Court, Northern District of California, Civil No. C 94 0935 VRW
Consultant for plaintiff

PowerQuest v. V Communications, Inc. & Quarterdeck Corporation, United States District Court, District of Utah, Central Division, Civil No. 2:97CV0783
Expert for plaintiff
Expert reports provided

Sightsound.com v. N2K, et al., United States District Court for the Western District of Pennsylvania, Civil No. 98-011823
Expert for plaintiff

Simon S. Goe, et al. v. Sanders Brine Shrimp Company, et al., United States District Court, District of Utah, Central Division, Civil No. 1:97CV0065B
Expert for plaintiff
Expert report provided
Deposition testimony: October 9, 1998

State of New York, et al., v. Microsoft Corporation, United States District Court, District of Columbia, Civil No. 98-1233 (CKK)
Technical consultant to plaintiffs

Stephen H. Bohn v. Park City Group, Inc., and Randy Fields, United States District Court, District of Utah, Central Division, Civil No. 94C521B
Expert for plaintiff
Expert report provided

Sun Microsystems, Inc. v. Microsoft Corporation, United States District Court, District of Maryland, Civil No. JFM-02-2739, MDL Docket No. 1332
Consultant to plaintiff

TV/COM International v. MediaOne of Greater Florida, et al., United States District Court,
Middle District of Florida, Jacksonville Division, Civil No. 3:00-cv-1045-J-21HTS
Expert for defendant Canal Plus
Deposition testimony: June 25, 2001
Trial testimony: June 26-27, 2001

United States v. Microsoft Corporation, United States District Court, District of Columbia, Civil
No. 94cv1564
Expert for plaintiff

United States v. Richard Hirko et al. United States District Court, Southern District of Texas,
Houston Division, Criminal No. H-03-93-00
Consultant to United States Department of Justice

*Wayne Johnson and Oxbow Development Corporation v. Rocky Mountain Development
Corporation, et al.*, United States District Court, District of Utah, Central Division, Civil
No. 2:95-CV-0512 C
Expert for plaintiff
Declaration filed