

EXHIBIT 5



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Farber et al.

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(54) **ACCESSING DATA IN A DATA PROCESSING SYSTEM**

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This patent is subject to a terminal disclaimer.

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G06F 17/30 (2006.01)

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(58) **Field of Classification Search** 707/758, 707/781, 821

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,668,647	A	6/1972	Evangelisti
3,835,260	A	9/1974	Prescher et al.
4,096,568	A	6/1978	Bennett et al.
4,215,402	A	7/1980	Mitchell
4,221,003	A	9/1980	Chang et al.
4,290,105	A	9/1981	Cichelli
4,376,299	A	3/1983	Rivest
4,405,829	A	9/1983	Rivest
4,412,285	A	10/1983	Neches

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 268 069 A2 5/1988

(Continued)

OTHER PUBLICATIONS

Affidavit of Timothy P. Walker in Support of CWIS' Opening Markman Brief Construing the Terms at Issue in U.S. Patent No. 6,415,280, dated Jul. 25, 2003, from Civil Action No. 02-11430 RWZ.

(Continued)

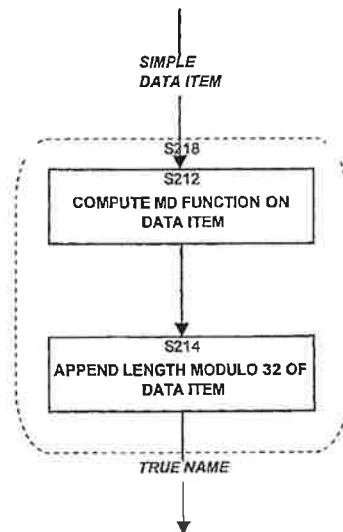
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(57) **ABSTRACT**

Access to data items uses names based on the data in the data items; the name of a data item may be based, at least in part, on a function of some or all of the bits that comprise the data item. A data item may comprise an arbitrary sequence of bits. The function may include a hash function or a message digest function. The name of a data item may be compared to a list of names of other data items.

178 Claims, 31 Drawing Sheets



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U.S. PATENT DOCUMENTS							
4,414,624	A	11/1983	Summer, Jr.	5,438,508	A	8/1995	Wyman
4,441,155	A	4/1984	Fletcher	5,442,343	A	8/1995	Cato et al.
4,464,713	A	8/1984	Benhase	5,448,668	A	9/1995	Peielson et al.
4,490,782	A	12/1984	Dixon	5,448,718	A	9/1995	Cohn et al.
4,558,413	A	12/1985	Schmidt et al.	5,452,447	A	9/1995	Nelson et al. 707/205
4,571,700	A	2/1986	Emry, Jr.	5,454,000	A	9/1995	Dorfinan
4,577,293	A	3/1986	Matick	5,454,039	A	9/1995	Coppersmith et al.
4,642,764	A	2/1987	Auslander	5,459,860	A	10/1995	Burnett
4,642,793	A	2/1987	Meaden	5,465,365	A	11/1995	Winterbottom
4,658,093	A	4/1987	Hellman	5,467,471	A	11/1995	Bader
4,675,810	A	6/1987	Gruner	5,475,826	A	12/1995	Fischer
4,691,299	A	9/1987	Rivest	5,479,654	A	12/1995	Squibb
4,725,945	A	2/1988	Kronstadt	5,491,817	A	2/1996	Gopal et al.
4,773,039	A	9/1988	Zamora	5,499,294	A	3/1996	Friedman
4,821,184	A	4/1989	Clancy et al.	5,504,879	A	4/1996	Eisenberg et al.
4,887,235	A	12/1989	Holloway	5,530,757	A	6/1996	Krawczyk
4,888,681	A	12/1989	Barnes	5,537,585	A	7/1996	Blickenstaff et al.
4,914,571	A	4/1990	Baratz et al.	5,542,087	A	7/1996	Neimat et al. 707/10
4,914,586	A	4/1990	Swinehart et al.	5,548,724	A	8/1996	Akizawa et al.
4,922,414	A	5/1990	Holloway	5,553,143	A	9/1996	Ross et al.
4,922,417	A	5/1990	Churm et al. 707/1	5,568,181	A	* 10/1996	Greenwood et al. 725/92
4,937,863	A	6/1990	Robert et al.	5,581,615	A	12/1996	Stern
4,949,302	A	8/1990	Arnold et al.	5,581,758	A	12/1996	Burnett
4,953,209	A	8/1990	Ryder, Sr. et al.	5,581,764	A	12/1996	Fitzgerald et al.
4,972,367	A	11/1990	Burke	5,583,995	A	* 12/1996	Gardner et al. 709/219
5,014,192	A	5/1991	Mansfield et al.	5,588,147	A	12/1996	Neeman et al.
5,025,421	A	6/1991	Cho	5,596,744	A	1/1997	Dao et al.
5,032,979	A	7/1991	Hecht et al.	5,600,834	A	2/1997	Howard
5,047,918	A	9/1991	Schwartz et al.	5,604,803	A	2/1997	Aziz
5,050,074	A	9/1991	Marca	5,604,892	A	2/1997	Nuttall et al.
5,050,212	A	9/1991	Dyson	5,630,067	A	5/1997	Kindell et al.
5,057,837	A	10/1991	Colwell	5,632,031	A	5/1997	Velissaropoulos et al.
5,077,658	A	12/1991	Bendert	5,638,443	A	6/1997	Stefik et al. 705/54
5,084,815	A	1/1992	Mazzario	5,640,564	A	6/1997	Hamilton et al. 709/303
5,117,351	A	5/1992	Miller	5,649,196	A	7/1997	Woodhill et al.
5,129,081	A	7/1992	Kobayashi	5,677,952	A	10/1997	Blakley, III et al.
5,129,082	A	7/1992	Tu'fing	5,678,038	A	10/1997	Dockter et al.
5,144,667	A	9/1992	Pogue, Jr.	5,678,046	A	10/1997	Cahill et al.
5,163,147	A	11/1992	Orita	5,694,472	A	12/1997	Johnson et al.
5,179,680	A	1/1993	Colwell	5,694,596	A	12/1997	Campbell
5,182,799	A	1/1993	Tamura et al.	5,701,316	A	12/1997	Alferness et al.
5,199,073	A	3/1993	Scott	5,710,922	A	1/1998	Alley et al.
5,202,982	A	4/1993	Gramlich et al. 707/2	5,724,425	A	3/1998	Chang et al.
5,204,897	A	4/1993	Wyman	5,724,552	A	3/1998	Taoda
5,204,958	A	4/1993	Cheng et al.	5,742,807	A	4/1998	Masinter
5,204,966	A	4/1993	Wittenberg et al.	5,745,879	A	4/1998	Wyman
5,208,858	A	5/1993	Vollert	5,757,913	A	5/1998	Bellare et al.
5,222,134	A	6/1993	Waite et al.	5,757,915	A	5/1998	Aucsmith et al.
5,230,051	A	7/1993	Quan	5,781,629	A	7/1998	Haber 713/177
5,239,648	A	8/1993	Nukui	5,802,291	A	9/1998	Balick et al. 709/202
5,241,671	A	8/1993	Reed et al.	5,809,494	A	9/1998	Nguyen 707/1
5,247,620	A	9/1993	Fukuzawa et al.	5,826,049	A	10/1998	Ogata et al.
5,260,999	A	11/1993	Wyman	5,835,087	A	11/1998	Herz 346/810
5,276,869	A	1/1994	Forrest et al.	5,864,683	A	1/1999	Boebert et al.
5,276,901	A	1/1994	Howell	5,907,619	A	5/1999	Davis
5,287,499	A	2/1994	Nemes 707/2	5,907,704	A	5/1999	Gudmundson et al.
5,287,514	A	2/1994	Gram	5,940,504	A	8/1999	Griswold
5,297,279	A	3/1994	Bannon et al.	5,978,791	A	11/1999	Farber et al.
5,301,286	A	4/1994	Rajani	5,991,414	A	11/1999	Garay et al.
5,301,316	A	4/1994	Hamilton	6,006,018	A	12/1999	Burnett et al. 395/200.49
5,317,693	A	5/1994	Cuenod et al.	6,134,603	A	10/2000	Jones et al. 709/330
5,321,841	A	6/1994	East et al.	6,135,646	A	10/2000	Kahn et al.
5,339,403	A	8/1994	Parker	6,415,280	B1	7/2002	Farber et al.
5,341,477	A	8/1994	Pitkin et al. 709/226	6,732,180	B1	5/2004	Hale et al.
5,343,527	A	8/1994	Moore	6,816,872	B1	11/2004	Squibb
5,347,653	A	9/1994	Flynn et al.	6,928,442	B2	8/2005	Farber et al.
5,351,302	A	9/1994	Leighton et al.	2002/0052884	A1	5/2002	Farber et al.
5,357,440	A	10/1994	Talbot et al.	2002/0082999	A1	6/2002	Lee et al.
5,357,623	A	10/1994	Megory-Cohen	2003/0078888	A1	4/2003	Lee et al.
5,357,630	A	10/1994	Oprescu et al.	2003/0078889	A1	4/2003	Lee et al.
5,359,523	A	10/1994	Talbot et al.	2003/0095660	A1	5/2003	Lee et al.
5,361,356	A	11/1994	Clark et al.	2004/0139097	A1	7/2004	Farber et al.
5,371,897	A	12/1994	Brown et al.	2005/0010792	A1	1/2005	Carpentier et al.
5,375,206	A	12/1994	Hunter et al.	2005/0114296	A1	5/2005	Farber et al.
5,384,565	A	1/1995	Cannon	2007/0185848	A1	3/2007	Farber et al.
5,394,555	A	2/1995	Hunter et al.	2008/0065635	A1	3/2008	Farber et al.
5,403,639	A	4/1995	Belsan et al.	2008/0066191	A1	3/2008	Farber et al.
5,404,508	A	4/1995	Konrad	2008/0071855	A1	3/2008	Farber et al.
				2008/0082551	A1	3/2008	Farber et al.

US 8,099,420 B2

Page 3

FOREIGN PATENT DOCUMENTS

EP	0 315 425	5/1989
EP	0 558 945 A2	9/1993
EP	0 566 967 A2	10/1993
EP	0592045	4/1994
EP	0631 226 A1	12/1994
EP	0 654 920 A2	5/1995
EP	0 658 022 A2	6/1995
GB	2294132 A	4/1996
JP	59058564	4/1984
JP	63-106048	5/1988
JP	63-273961	11/1988
JP	2-127755	5/1990
JP	05162529	6/1993
JP	06187384 A2	7/1994
JP	06348558 A	12/1994
WO	WO 92/20021	11/1992
WO	WO 94/06087	3/1994
WO	WO 94/20913	9/1994
WO	WO 95/01599	1/1995
WO	WO 97/43717	11/1997

OTHER PUBLICATIONS

Akamai and MIT's Memorandum in Support of Their Claim Construction of USPAT 5,978,791, dated Aug. 31, 2001, from Civil Action No. 00-cv-11851RWZ.

Akamai's Answer, Affirmative Defenses and Counterclaims to Amended Complaint, filed Dec. 6, 2002, in Civil Action No. 02-CV-11430RWZ.

Akamai's Brief on Claim Construction, dated Aug. 8, 2003, from Civil Action No. 02-11430 RWZ.

Answer of Defendant RIAA to First Amended Complaint and Counterclaim, dated Feb. 8, 2005, from Civil Action No. CV04-7456 JFW (CTx).

Berners-Lee, T. et al., "Hypertext Transfer Protocol—HTTP/1.0," May 1996, pp. 1-54.

Berners-Lee, T., "Universal Resource Identifiers in WWW," Jun. 1994, pp. 1-25.

Bowman, C. Mic, et al., "Harvest: A Scalable, Customizable Discovery and Access System," Aug. 4, 1994, pp. 1-27.

Bowman, C. Mic, et al., "Harvest: A Scalable, Customizable Discovery and Access System," Mar. 12, 1995, pp. 1-29.

Brisco, T., "DNS Support for Load Balancing," Apr. 1995, pp. 1-7.

Browne, Shirley et al., "Location-Independent Naming for Virtual Distributed Software Repositories," 1995, 7 pages.

Browne, Shirley et al., "Location-Independent Naming for Virtual Distributed Software Repositories," 1995, printed from <http://www.netlib.org/utk/papers/lifn/main.html> on Mar. 22, 2006, 18 pages.

Civil Minutes General dated Jan. 25, 2005, from Civil Action No. CV 04-7456-JFW (CTx).

Complaint for Patent Infringement, Permanent Injunction, and Damages, dated Sep. 8, 2004, from Civil Action No. CV 04-7456 JFW (AJWx).

CWIS' Opening Markman Brief Construing the Terms at Issue in U.S. Patent No. 6,415,280, dated Jul. 25, 2003, from Civil Action No. 02-11430 RWZ.

CWIS' Reply Markman Brief Construing the Terms at Issue in U.S. Patent No. 6,415,280, dated Aug. 15, 2003, from Civil Action No. 02-11430 RWZ.

Davis, James R., "A Server for a Distributed Digital Technical Report Library," Jan. 15, 1994, pp. 1-8.

Declaration of Robert B.K. Dewar in Support of CWIS' Construction of the Terms at Issue in U.S. Patent No. 6,415,280, dated Jul. 25, 2003, from Civil Action No. 02-cv-11430RWZ.

Defendant Digital Island's Opening Brief on Claim Construction Issues dated Aug. 17, 2001, from Civil Action No. 00-cv-11851-RWZ.

Defendant MediaSentry, Inc.'s Reply Memorandum of Points and Authorities in Further Support of Its Motion to Dismiss, dated Nov. 15, 2004, from Civil Action No. CV04-7456 JFW (CTx).

Defendant MediaSentry Inc.'s Notice of Motion and Motion to Dismiss First Amended Complaint; Memorandum of Points and Authorities in Support Thereof, dated Dec. 13, 2004, from Civil Action No. CV04-7456 JFW .

Defendant MediaSentry, Inc.'s Answer to Plaintiffs' First Amended Complaint and Counterclaims, dated Feb. 8, 2005, from Civil Action No. CV04-7456 JFW (CTx).

Defendant RIAA's Notice of Motion and Motion to Dismiss First Amended Complaint; Memorandum of Points and Authorities in Support Thereof, dated Dec. 13, 2004, from Civil Action No. CV04-7456 JFW (CTx).

Defendants Loudeye Corp.'s and Overpeer, Inc.'s Answer to Plaintiffs' First Amended Complaint and Counterclaim, dated Feb. 8, 2005, from Civil Action No. 04-7456 JFW (AJWx).

Defendants' Preliminary Invalidity Contentions dated Dec. 14, 2006, from Civil Action No. CV 06-5086 SJO (Ex).

European Search Report issued Dec. 23, 2004 in corresponding European Application No. 96910762.2-2201.

Expert Report of Professor Ellis Horowitz, dated Mar. 6, 2006, from Civil Action No. 04-7456 JFW (CTx).

Expert Report of the Honorable Gerald J. Mossinghoff, dated Mar. 13, 2006, from Civil Action No. 04-7456 JFW (CTx).

Faltstrom, P. et al., "How to Interact with a Whois++ Mesh," Feb. 1996, pp. 1-9.

Fielding, R. et al., "Hypertext Transfer Protocol—HTTP/1.1," Jan. 1997, pp. 1-163.

Fielding, R. et al., "Hypertext Transfer Protocol—HTTP/1.1," Jun. 1999, pp. 1-157.

First Amended Complaint for Patent Infringement, Permanent Injunction and Damages, dated Nov. 24, 2004, from Civil Action No. CV 04-7456 JFW (CTx).

International Search Report dated Jun. 24, 1996 in corresponding international application PCT/US1996/004733.

Khare, R. and Lawrence, S., "Upgrading to TLS Within HTTP/1.1," May 2000, pp. 1-12.

Kim et al., "The Design and Implementation of Tripwire: A File System Integrity Checker", COAST Labs. Dept. of Computer Sciences Purdue University, Feb. 23, 1995, pp. 1-18.

Knuth, Donald E., "The Art of Computer Programming," 1973, vol. 3, Ch. 6.4, pp. 506-549.

Memorandum of Points and Authorities in Support of Loudeye's and Overpeer's Motion to Dismiss the First Amended Complaint for Failure to State a Claim or, in the Alternative, for a More Definitive Statement, dated Dec. 13, 2004, from Civil Action No. CV-04-7456 JFW (AJWx).

Moats, R., "URN Syntax," May 1997, pp. 1-8.

Myers, J. and Rose, M., "The Content-MD5 Header Field," Oct. 1995, pp. 1-4.

Office Action in corresponding Japanese Application No. 531,073/1996 mailed on Apr. 25, 2006.

Office Communication in corresponding European Application No. 96910762.2-1225 dated Jan. 17, 2007.

Order Re Claim Construction dated Nov. 8, 2001, from Civil Action No. 00-11851-RWZ.

Patent Abstracts of Japan, "Device for Generating Database and Method for the Same," Application No. 03-080504, Sun Microsystems, Inc., published Jun. 1993, 38 pages.

Patent Abstracts of Japan, "Method for Registering and Retrieving Data Base," Application No. 03-187303, Nippon Telegr. & Teleph. Corp., published Feb. 1993, 11 pages.

Plaintiffs' Memorandum of Points and Authorities in Opposition to Loudeye Defendants' Motion to Dismiss, dated Nov. 8, 2004, from Civil Action No. CV-04-7456 JFW (AJWx).

Plaintiffs' Opposition to Media Sentry's Motion to Dismiss; Memorandum of Points and Authorities in Support Thereof, dated Nov. 8, 2004, from Civil Action No. CV 04-7456 JFW (CTx).

Plaintiff's Opposition to Recording Industry Association of America's Motion to Dismiss; Memorandum of Points and Authorities in Support Thereof, dated Nov. 8, 2004, from Civil Action No. CV-04-7456 JFW (CTx).

Plaintiff's Reply to Defendant Loudeye Corp.'s and Overpeer, Inc.'s Counterclaims, dated Mar. 3, 2005, from Civil Action No. CV 04-7456 JFW (CTx).

Plaintiff's Reply to Defendant MediaSentry's Counterclaims, dated Mar. 3, 2005, from Civil Action No. CV 04-7456 JFW (CTx).

Plaintiff's Reply to Defendant RIAA's Counterclaims, dated Mar. 3, 2005, from Civil Action No. 04-7456 JFW (CTx).

US 8,099,420 B2

Page 4

- Reed Wade (wade@cs.utk.edu), "re: Dienst and BFD/IFN document." Aug. 8, 1994, printed from <http://www.webhistory.org/www.lists/www-talk1994q3/0416.html> on Mar. 22, 2006, (7 pages).
- Rivest, R., "The MD5 Message-Digest Algorithm," Apr. 1992, pp. 1-19 and errata sheet (1 page).
- Rose, M., "The Content-MD5 Header Field," Nov. 1993, pp. 1-3.
- Schneier, Bruce, "One-Way Hash Functions, Using Cryptographic Algorithms for Hashing," 1991, printed from <http://202.179.135.4/data/DDJ/articles/1991/9109/91909g/9109g.htm> on Mar. 22, 2006.
- Sun Microsystems, Inc., "NFS: Network File System Protocol Specification," Mar. 1989, pp. 1-25.
- Vincenzetti, David and Cotrozzi, Massimo, "Anti Tampering Program," Proceedings of the Fourth {USENIX} Security Symposium, Santa Clara, CA, 1993, 11 pages.
- Vincenzetti, David and Cotrozzi, Massimo, "Anti Tampering Program," Proceedings of the Fourth {USENIX} Security Symposium, Santa Clara, CA, undated, printed from http://www.ja.net/CERI/Vincenzetti_and_Cotrozzi/ATP_Anti_Tamp on Mar. 22, 2006, 8 pages.
- Berners-Lee, T. et al., "Uniform Resource Locators (URL)," pp. 1-25, Dec. 1994.
- Danzig, P.B., et al., "Distributed Indexing: A Scalable Mechanism for Distributed Information Retrieval," Proceedings of the 14th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, pp. 220-229, Oct. 13-16, 1991.
- Hauzeur, B. M., "A Model for Naming, Addressing, and Routing," ACM Trans. Inf. Syst., 4, Oct. 4, 1986), 293-311.
- Khoshafian, S. N. et al. 1986. Object identity. In Conf. Proc. on Object-Oriented Programming Systems. Languages and Applications (Portland, Oregon, United States, Sep. 29-Oct. 2, 1986). N. Meyrowitz, Ed. OOPSLA '86. ACM Press, New York, NY, 406-416.
- Lantz, K. A., et al., "Towards a universal directory service," In Proc. 4th Annual ACM Symp. on Principles of Distributed Computing (Minaki, Ontario, Canada), PODC '85. ACM Press, New York, NY, 250-260.
- Leach, P. J., et al., "The file system of an integrated local network. In Proc. 1985 ACM 13th Annual Conf. on Comp. Sci. CSC '85, ACM Press, NY, NY, 309-324.
- Leach, P.J., et al., "UIDs as Internal Names in a Distributed File System," In Proc. 1st ACM SIGACT-SIGOPS Symp. on Principles of Distributed Computing (Ottawa, Canada, Aug. 18-20, 1982), PODC '82. ACM Press, New York, NY, 34-41.
- Ma, C. 1992. On building very large naming systems. In Proc. 5th Workshop on ACM SIGOPS European Workshop: Models and Paradigms for Distributed Systems Structuring (France, Sep. 21-23, 1992). EW 5. ACM Press, New York, NY, 1-5.
- Peterson, L. L. 1988. A yellow-pages service for a local-area network. In Proc. ACM Workshop on Frontiers in Computer Communications Technology (Vermont, 1987). J. J. Garcia-Luna-Aceves, Ed. SIGCOMM '87. ACM Press, New York, NY, 235-242.
- Ravindran, K. and Ramakrishnan, K. K. 1991. A naming system for feature-based service specification in distributed operating systems. SIGSMALL/PC Notes 17, 3-4 (Sep. 1991), 12-21.
- Ross, K., "Hash-Routing for Collections of Shared Web Caches," IEEE Network Magazine, pp. 37-44, Nov.-Dec. 1997.
- Schwartz, M., et al. 1987. A name service for evolving heterogeneous systems. In Proc. 11th ACM Symp. on OS Principles (Texas, Nov. 8-11, 1987). SOSP '87. ACM Press, NY, NY, 52-62.
- Shaheen-Gouda, A. and Loucks, L. 1992. Name borders. In Proc. 5th Workshop on ACM SIGOPS European Workshop: Models and Paradigms for Distributed Systems Structuring (Mont Saint-Michel, France, Sep. 21-23, 1992). EW 5. ACM Press, NY, NY, 1-6.
- Terry, D. B. 1984. An analysis of naming conventions for distributed computer systems. In Proc. ACM SIGCOMM Symp. on Communications Architectures and Protocols: Tutorials & Symp. SIGCOMM '84. ACM Press, NY, NY, 218-224.
- Cheriton, David R. and Mann, Timothy P., "Decentralizing a global naming service for improved performance and fault tolerance", ACM Transactions on Computer Systems, vol. 7, No. 2, May 1989, pp. 147-183.
- Request for Reexamination of U.S. Patent No. 6,928,442: Reexam Control U.S. Appl. No. 90/010,260, filed Aug. 29, 2008.
- Kim et al., "Experiences with Tripwire: Using Integrity Checkers for Intrusion Detection", COAST Labs, Dept. of Computer Sciences Purdue University, Feb. 22, 1995, pp. 1-12.
- Kim et al., "The Design and Implementation of Tripwire: A File System Integrity Checker", COAST Labs, Dept. of Computer Sciences Purdue University, Nov. 19, 1993, pp. 1-21.
- Zhiyu Tian et al., A New Hashing Function: Statistical Behaviour and Algorithm, pp. 3-13.
- G. L. Friedman, Digital Camera with Apparatu for Authentication of Images Produced from an Image File, NASA Case No. NPO-19108-1-CU, U.S. Appl. No. 08/159,980, filed Nov. 24, 1993.
- H. Goodman, Ada. Object-Oriented Techniques, and Concurrency in Teaching Data Structures and File Management Report Documentation p. AD-A275 385-94-04277.
- Advances in Cryptology-EUROCRYPT'93; Workshop on the Theory and Application of Cryptographic Techniques Lofthus, Norway, May 23-27, 1993 Proceedings.
- Proceedings of the 1993 ACM SIGMOD International Conference on Management of Data, vol. 22, Issue 2, Jun, 1993.
- Advances in Cryptology-AUSCRYPT '92—Workshop on the Theory and Application of Cryptographic Techniques Gold Coast, Queensland, Australia, Dec. 13-16, 1992 Proceedings.
- Witold Litwin et al., Linear Hashing for Distributed Files, ACM SIGMOD, May 1993, pp. 327-336.
- Ming-Ling Lo et al., On Optimal Processor Allocation to Support Pipelined Hash Joins, ACM SIGMOD, pp. 69-78, May 1993.
- Thomas A. Berson, Differential Cryptanalysis Mod 2^{32} with Applications to MD5, pp. 69-81.
- William Perrizo et al., Distributed Join Processing Performance Evaluation, Twenty-Seventh Hawaii International Conference on System Sciences, vol. II, pp. 236-244.
- Vijay Kumar, A Concurrency Control Mechanism Based on Extendible Hashing for Main Memory Database Systems, ACM, vol. 3, 1989, pp. 109-113.
- Birgit Pfitzner, Sorting Out Signature Schemes, Nov. 1993, 1st Conf. Computer & Comm. Security '93, p. 74-85.
- Bert dem Boer et al., Collisions for the compression function of MD₅, pp. 292-304.
- Sakti Pramanik et al., Multi-Directory Hasing, 1993, Info. Sys., vol. 18, No. 1, pp. 63-74.
- Murfidhar Koushik, Dynamic Hashing with Distributed Overflow Space: A File Organization with Good Insertion Performance, 1993, Info. Sys., vol. 18, No. 5, pp. 299-317.
- Witold Litwin et al., LH*-Linear Hashing for Distributed Files, HP Labs Tech. Report No. HPL-93-21, Jun. 1993, pp. 1-22.
- Yuliang Zheng et al., HAVAL—A One-Way Hashing Algorithm with Variable Length of Output (Extended Abstract), pp. 83-105.
- Chris Charnes and Josef Pieprzky, Linear Nonequivalence versus Nonlinearity, Pieprzky, pp. 156-164.
- Gwartzman, James, et al. "The Case for Geographical Push-Caching," Technical Report HU TR 34-94 (excerpt), Harvard University, DAS, Cambridge, MA 02138, 1994, 2 pgs.
- Grigni, Michelangelo, et al. "Tight Bounds on Minimum Broadcasts Networks," SIAM Journal of Discrete Mathematics, vol. 4, No. 2, May 1991, pp. 207-222.
- Devine, Robert, "Design and Implementation of DDH: A Distributed Dynamic Hashing Algorithm." In Proceedings of 4th International Conference on Foundations of Data Organizations and Algorithms, 1993, pp. 101-114.
- Deering, Stephen, et al. "Multicast Routing in Datagram Internetworks and Extended LANs," ACM Transactions on Computer Systems, vol. 8, No. 2, May 1990, pp. 85-110.
- Cormen, Thomas H., et al. *Introduction to Algorithms*, The MIT Press, Cambridge, Massachusetts, 1994, pp. 219-243, 991-993.
- Naoir, Moni, et al. "The Load, Capacity and Availability of Quorum Systems." In Proceedings of the 35th IEEE Symposium on Foundations of Computer Science, Nov. 1994, pp. 214-225.
- Nisan, Noam. "Pseudorandom Generators for Space-Bounded Computation." In Proceedings of the Twenty-Second Annual ACM Symposium on Theory of Computing, May 1990, pp. 204-212.
- Palmer, Mark, et al. "Fido: A Cache that Learns to Fetch." In Proceedings of the 17th International Conference on Very Large Data Bases, Sep. 1991, pp. 255-264.

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