Dr. Ophir Frieder
Citizenship: U.S.

Permanent Address:
111 E. Chestnut, Apt. 24A
Chicago, IL 60611
(312) 397-9177

Business Address:
Dept. of Computer Science
Georgetown University
Washington, DC 20057
(202) 687-2165
ophir@cs.georgetown.edu

Areas of Interest (Research and Teaching)

Scalable information processing systems from information retrieval to communications technology.

Education

University of Michigan, Ann Arbor, Michigan (1981 - 1987)

Doctor of Philosophy in Computer Science and Engineering, 1987.
Master of Science in Computer Science and Engineering, 1985.
Bachelor of Science in Computer and Communication Sciences, 1984.
Graduated Summa Cum Laude.

Employment: (Full time)

August 2007 – present
Royden B. Davis, S. J., Chair in Interdisciplinary Studies
Georgetown University, Washington, District of Columbia.

September 1999 – present (on leave: September 2007 – August 2008)
Director of the Information Retrieval Laboratory
September 1998 – present (on leave: September 2007 – August 2008)
IITRI Professor of Computer Science
Department of Computer Science
Illinois Institute of Technology, Chicago, Illinois.

September 1996 – August 1998
Harris Professor of Computer Science and Computer Engineering
Division of Electrical and Computer Science and Engineering
Florida Institute of Technology, Melbourne, Florida.

September 1995 – August 1996   (on leave: September 1996 – August 1998)
Professor,
August 1994 – August 1995
Associate Department Chair,
September 1992 – August 1995
Associate Professor,
September 1990 – August 1992
Assistant Professor,
Department of Computer Science,
George Mason University, Fairfax, Virginia.

June 1987 – September 1990
Member of Technical Staff
Applied Research Area,
Bell Communications Research, Morristown, New Jersey.

Consulting:

    Staff Positions:

        January 2001 – present
        August 1996 – February 1999
        Consultant to the Information/Government Systems Division
        Harris Corporation
        Melbourne, Florida

        May 1999 – December 2000
        Consultant
        IIT Research Institute
        Chicago, Illinois / Bethesda, Maryland

        August 1995 – September 1997
        Consultant
        Software Productivity Consortium (SPC)
        Herndon, Virginia

        September 1994 – August 1996
        Consultant
        Science Applications International Corporation (SAIC)
        Arlington, Virginia

        November 1993 – June 1994
        Consultant
        IBM Federal Systems Company, (Loral Federal Systems - as of March 1994)
        Manassas, Virginia

        June 1992 – August 1993
        Consultant to the Computer and Software Engineering Division,
        Institute for Defense Analysis,
        Alexandria, Virginia

        August 1991 – July 1993
        Consultant to the Technical Services Division at Headquarters,
        Federal Bureau of Investigation,
        Washington, DC

    Selected Short Term Consultancy Contracts:

        Computer Sciences Corporation (CSC), Landham, Maryland
        IBM German Software Development Laboratory, Germany
        Computer Data Systems, Inc. (CDSI), Rockville, Maryland
        Information Systems & Networks Corporation, Bethesda, Maryland
        CALIBRE Systems, Inc., Falls Church, Virginia
        The Library Corporation, Inwood, West Virginia

Legal Consulting:

Consulted as a technical expert or as an expert witness on several intellectual property disputes. Disputed topics include multiple Internet commerce and software technology issues. Cases include:

Case: MercExchange vs. GoTo.com
Role: Plaintiff expert witness
Firm: Hunton & Williams
Resolution: Out of court settlement

Case: MercExchange vs. Ebay.com
Role: Plaintiff expert witness
Firm: Hunton & Williams
Resolution: Willful infringement court verdict – heard by U.S. Supreme Court

Case: Two major US companies
Role: Defense technical expert
Firm: Venable
Resolution: case dismissed

Case: e-Plus.com vs. Ariba.com
Role: Plaintiff expert witness
Firm: Hunton & Williams
Resolution: Willful infringement court verdict

Case: Autobytel.com vs. Dealix.com
Role: Plaintiff technical expert
Firm: Paul Hastings
Resolution: Out of court settlement

Case: IBM vs. Amazon
Role: Plaintiff technical expert
Firm: Jones Day
Resolution: Out of court settlement

Technical opinions provided in other preliminary intellectual property discussions.

Board of Advisors

November 2006 – present
SyynX Solutions GmbH
Cologne, Germany

September 2006 – present
SUMMIZE
Oakton, Virginia

October 2000 – December 2001
MicroCreditCard (acquired Javien Digital Payment Solutions)
Arlington, Virginia

Honors

2007 ASIST Research Award
ACM Fellow, "… contributions to search systems for distributed data," 2005
AAAS Fellow, "…scalable information systems, from communications technology to information processing," 2004
IEEE Fellow, "… the design and development of scalable multi-data type information systems," 2002
Best Paper Award, 35$^{\text{th}}$ Hawaiian International Conference on Systems Science: Software Track, 2002
Best Paper Award, IEEE Fourth International Conference on Computer & Communications Networks, 1995
NSF National Young Investigator, 1993
International Information Science Foundation Award of Japan, 1993

Local Recognition

Illinois Institute of Technology – College of Science & Letters Dean's Research Excellence Award, 2005
Florida Institute of Technology – University Wide Research Excellence Award, 1998
Florida Institute of Technology – College of Engineering Research Excellence Award, 1998
Harris Information Systems Division – Contributions Recognition Award, 1997

University Committees Served

Illinois Institute of Technology (1998 - present)
Chair, Computer Science Department Awards Committee (01/02, 02/03, 03/04, 04/05, 05/06, 06/07)
Chair, Computer Science Department Recruiting Committee (98/99, 99/00, 00/01, 01/02, 02/03, 03/04)
Member, University Wide Promotions Review Committee (02/03, 03/04, 04/05)
Chair, Chairman Review Committee (03/04)
Member, College of Science and Letters Dean Search Committee (02/03)
Member, University Wide Research Council (99/00, 00/01, 01/02)
Member, Armour College Promotions Review Committee (98/99, 99/00, 00/01, 01/02)
Member, Bioengineering Director Search Committee (99/00)
Member, Computer Science Chair Search Committee (98/99, 99/00)
Member, Armour Dean Search Committee (98/99)

Florida Institute of Technology (1996 - 1998)
Member, University Wide Promotions Review Committee (97/98)
Member, School of Engineering Promotions Review Committee (96/97, 97/98)
Member, Computer Science Department Recruiting Committee (97/98)
Member, Computer Science Department Graduate Committee (96/97)

George Mason University (1990 - 1996)
Chair, Computer Science Department Recruiting Committee (95/96)
Ph.D. Coordinator, School of Information Technology and Engineering (93/94)
School Representative, University Wide High Achievement Committee (93/94)
Member, Computer Science Department Recruiting Committee (91/92, 93/94)
Member, Computer Science Department Graduate Committee (92/93)
Chair, Computer Science Department Graduate Committee (91/92)
Member, School of Information Technology and Engineering Graduate Committee (91/92)
Member, Computer Science Department Undergraduate Committee (90/91)

Professional Activities
ACM Distinguished Lecturer Program, 2002 - 2004
IEEE Distinguished Visitor Program, 2000 - 2002

Editorial Involvement
Editorial Board Member, *Journal of Supercomputing,* 1999 – present
Editorial Board Member, *J. of the American Society for Information Science (& Technology),* 1997 – present
Editorial Board Member, *Information Retrieval,* 1997 – 2004.
Editorial Board Member, *Optical Networks Magazine,* 2001 – 2003
Editorial Board Member, *IEEE Software*, 1997 & 1998
Associate Editor in Chief, *IEEE Software*, 1995 & 1996
Area Editor: Databases, *IEEE Computer*, 1993 & 1994

Conference Involvement: Leadership Role
Steering Committee Co-Chair, *Int'l Conf. On Scalable Information Systems (INFOSCALE)*, 2005 – present
Steering Committee Member, *ACM (CIKM) Conf. on Information & Knowledge Management*, 1995 – present
Co-General Chair, *IEEE Third Int'l Symp. on Network Computing & Applications*, 2004
Program Chair for Information Retrieval, *ACM (CIKM) Conf. on Information & Knowledge Management*, 2003.
Co-General Chair, *IEEE Sixth Conf. on Computer & Communications Networks,* 1997.
Co-Program Chair, *IEEE Fifth Conf. on Computer & Communications Networks,* 1996.
Co-Program Chair, *IEEE Fourth Symp. on Assessment of Software Tools,* 1996.
Tutorial Chair, *IEEE Second Conf. on Multimedia Computing Systems,* 1995.
Program Committee Vice-Chair, *IEEE Fifth Conf. on Data Engineering,* 1989.

Conference Involvement: Committee Participation Role
Program Committee, *ACM (SIGIR) Conf on Res. & Dev. in Information Retrieval,* 1993, 2001, 2003 – 2007
Program Committee, *ACM (CIKM) Conf. on Information & Knowledge Management*, 1995 – 2002, 2004 – 2007
Program Committee, *IEEE Int'l Symp. on Network Computing & Applications*, 2005 – 2007
Program Committee, *Int'l Symp. High Performance Computing*, 1999, 2000, 2002. 2003
Program Committee, *IEEE (IC3N) Conf. on Computer & Communications Networks,* 1993 – 2000, 2002, 2003
Program Committee, *IEEE International Symposium on Network Computing and Applications*, 2001, 2002
Program Committee, *International Conference on Web Information Systems Engineering,* 2001, 2002
Program Committee, *IEEE Data Engineering Conf.,* 1988, 1996, 1998.
Program Committee, *ACM/IEEE Conf. on Systems Integration,* 1992, 1994

MS Thesis Supervision
1. Lynn Allen, <u>Exploiting Database Technology in Medical Arenas: A Critical Assessment of PACS</u>, New Jersey Institute of Technology, May 1991.
2. James Villani, <u>Design and Development of a Parallel Protocol Verification System Prototype for a Hypercube Multicomputer</u>, George Mason University, May 1993.
3. Ajay Gupte<u>, Compression Within a Context-Sensitive Commercial Random Access Domain</u>, George Mason University, May 1993.
4. Elizabeth Pulley, <u>A Text Preprocessor for Relevance Ranking in the Relational Model</u>, George Mason University, May 1994.
5. John Reichert, <u>Implementation Details of Relevance Feedback in an Information Retrieval Systems</u>, George Mason University, December 1996.
6. Abdur Chowdhury, <u>DRS: A Fault Tolerant Network Routing System For Mission Critical Distributed Applications</u>, George Mason University, December 1996.
7. Wei Guan, <u>Internal-Based Timing Constraints with Non-Uniform Distribution of Event Occurrence</u>, Illinois Institute of Technology, July 2005.

Ph.D. Dissertation Supervision

1. Fotios N. Barlos, <u>DOME: Dynamic Optimization on Multiprocessor Engines - *A Statistical Approach*</u>, Ph.D. Thesis, George Mason University, May 1993.
2. Kyeongmo S. Park, <u>Parallel Heuristic Approaches to Multiprocessor Data Allocation</u>, Ph.D. Thesis, George Mason University, August 1994. (Co-thesis advisor: Dr. Arun Sood)
3. W. Addison Woods, LTC (Army), <u>Data Organization, Scheduling, and Presentation in Parallel Information Retrieval Architectures,</u> Ph.D. Thesis, George Mason University, May 1995.
4. Tieng K. Yap, <u>High Performance Computing in Genetics</u>, Ph.D. Thesis, George Mason University, May 1995.
5. David Grossman, <u>Integrating Structured Data and Text: A Relational Approach</u>, Ph.D. Thesis, George Mason University, December 1995.
6. Anthony Ruocco, LTC (Army), <u>Parallel Clustering and Classification of Monolithic and Non-Monolithic Document Bases</u>, Ph.D. Thesis, George Mason University, May 1996.
7. Sorin G. Nastea, <u>Parallel Solutions for Sparse Matrix Computations,</u> Ph.D. Thesis, George Mason University, December 1996.
8. Alaa Sheta, <u>Identification and Control of Dynamical Systems Using Genetic Algorithms</u>, Ph.D. Thesis, George Mason University, August 1997. (Co-thesis advisor: Dr. Kenneth De Jong)
9. Carol Lundquist, <u>Relational Information Retrieval: Using Relevance Feedback and Parallelism to Improve Accuracy and Performance,</u> Ph.D. Thesis, George Mason University, December 1997.
10. Brian Willard, <u>Large Scale Information Retrieval Systems: Resolving Memory Leaks in Non-Cooperative Server Applications,</u> Ph.D. Thesis, Florida Institute of Technology, May 1998.
11. Richard James, <u>Performance Considerations for Information Filtering Systems Using Database Technology</u>, Ph.D. Thesis, Florida Institute of Technology, May 1998.
12. Nicole Melander, <u>Multiple Document Summarization for Written Argumentative Discourse,</u> Ph.D. Thesis, George Mason University, August 1999.
13. Kenneth Alford, LTC (Army), <u>Parallel Information Retrieval and Visualization on Large, Unstructured Document Collections Using Web Link Information,</u> Ph.D. Thesis, George Mason University, May 2000. (Co-thesis advisor: Dr. Jim Chen)
14. M. Catherine McCabe, <u>Information Extraction and Fusion for Information Retrieval Effectiveness,</u> Ph.D. Thesis, George Mason University, August 2000.
15. Abdur Chowdhury, <u>On the Design of Reliable and Efficient Information Servers</u>, Ph.D. Thesis, Illinois Institute of Technology, May 2001.
16. Salim Mounir Alaoui, <u>On the Clustering, Fusion, and Balanced Distribution of Data for Information Retrieval</u>, Ph.D. Thesis, Florida Institute of Technology, May 2002. (Co-thesis advisor: Dr. Phil Bernhard)
17. Mohammed Aljlayl, <u>On Arabic Search: The Effectiveness of Monolingual and Bidirectional Information Retrieval,</u> Ph.D. Thesis, Illinois Institute of Technology, July 2002.
18. Vincent Nguyen, <u>Channel Alternation and Rotation for Sectorized Wireless Systems,</u> Ph.D. Thesis, Illinois Institute of Technology, May 2003. (Co-thesis advisor: Dr. Peng-Jun Wan)
19. S. Kagan Agun, <u>Hardware Assisted Pruned Inverted Index Component Design and Implementation,</u> Ph.D. Thesis, Illinois Institute of Technology, December 2004.
20. Steven Beitzel, <u>On Understanding and Classifying Web Queries</u>, Ph.D. Thesis, Illinois Institute of Technology, May 2006.
21. Eric Jensen, <u>Repeatable Evaluation of Information Retrieval Effectiveness in Dynamic Environments</u>, Ph.D. Thesis, Illinois Institute of Technology, May 2006.
22. Eric Burger, <u>Ubiquitous Reach and Remote Control of Devices</u>, Ph.D. Thesis, Illinois Institute of Technology, May 2006.
23. Rebecca Cathey, <u>On Scalable Search</u>, Ph.D. Thesis, Illinois Institute of Technology, December 2007.

Research Presentations Given

Distinguished Lecturer

Keynote, 2nd Int'l Conference on Wireless Algorithms, Systems and Applications, August 2, 2007

Keynote, 1st Workshop on Large-Scale Distributed Systems for Information Retrieval, July 27, 2007

Keynote, Descartes Conf. on Mathematical Models in Counterterrorism, US Capitol, September 29, 2006

Keynote, SPIE Electronic Imaging: Document Recognition and Retrieval XIII, January 19, 2006

Distinguished Lecture, 6th Shanghai International Industrial Fair Forum, November 3, 2004

Midnight Seminar (Distinguished Lecture), Telcordia Technologies (formerly Bellcore), February 18, 2004.

Keynote, IEEE 2nd Int'l Symposium on Network Computing and Applications (NCA-03), April 18, 2003

Keynote, ACM 11th Int'l Conf. on Information and Knowledge Management, November 5, 2002

Keynote, IEEE 3rd Int'l Conf. on Information Technology: Coding and Computing, April 8, 2002

Academic (ACM/IEEE) Distinguished Lecturer

University of Louisville (IEEE Distinguished Lecture Series), 2006

Florida International University (IEEE Distinguished Lecture Series), 2005

DePaul University (ACM Distinguished Lecturer), 2004

University of Central Florida (ACM Distinguished Lecturer), 2003 & 2004

Florida Institute of Technology (ACM Distinguished Lecturer), 2003

University of Nevada – Reno (IEEE Distinguished Visitor), 2001

Southern Adventist University (School of Computer Science Commencement Speaker), 2000

Industrial and Government Laboratories

America Online, Arab Academy of Science and Technology (Egypt), Argonne National Laboratories, Army Research Laboratory, AT&T Bell Laboratories, Bell Communications Research (Bellcore), Equifax Corporation, Fujitsu Laboratories (Japan), General Dynamics Advanced Information Systems, Harris Information Systems Division, IBM German Software Development Laboratory, IBM T. J. Watson Research Center, IIT Research Institute - Lanham, Institute for Defense Analysis, Japan Electrical Industrial Development Association, Jet Propulsion Laboratories, J. P. Morgan Bank - Parallel Technology Division, Lexis-Nexis, The MITRE Corporation, Mitsubishi Laboratories (Japan), Motorola, National Institutes of Health, NASA Goddard Space Flight Center, NEC Research Institute, PRT Corporation of America, Telcordia Technologies, Telemarc Corporation, Tribune Corporation.

Universities

Al-Akhawayn University (Morocco), Ben-Gurion University (Israel), Carnegie Mellon University, Case Western Reserve University, Central Connecticut State University, City University of New York - Graduate Center, Colorado School of Mines, Emory University, ETH – Zurich (Switzerland), Georgetown University, George Washington University, Georgia Institute of Technology, Illinois Institute of Technology, Israel Institute of Technology (Israel), Lehigh University, Louisiana State University, New Jersey Institute of Technology, Milwaukee School of Engineering, Northwestern University, Rangsit University (Thailand), Rensselaer Polytechnic Institute, Rutgers University, Shanghai Jiao Tong University (China), SUNY at Buffalo, Syracuse University, University of Bremen (Germany), University of California at Santa Barbara, University of Chicago, University of Colorado at Colorado Springs, University of Illinois at Chicago, University of Illinois at Urbana-Champaign, University of Maryland, University of Minnesota, University of Pennsylvania, University of Tokyo (Japan).

International Patent

- "Dynamic Memory Reclamation Without Programmer, Compiler or Linker Assistance". Patent filing by Northrop-Grumman. **EPO Patent #EPO959409 B1.** Issued June 25, 2003. (Co-Inventor: B. Willard)

US Patents and Patent Applications

1. "Dynamic Algorithm Selection for Isocontour and Body Extraction within a Multiple Instruction Multiple Data Multiprocessor". Filed by Wright Patterson Air Force Base, Dayton, Ohio. **US Patent #5,201,035.** April 6, 1993. (Co-Inventor: M. R. Stytz.)
2. "Dynamic Query Optimization Using Partial Information". Filed by Bell Communications Research. **US Patent #5,335,345.** August 2, 1994. (Co-Inventor: G. Frieder.)
3. "Parallel Document Clustering Process". Filed by the Judge Advocate General Office, Department of the Army. **US Patent #5,864,855.** January 26, 1999. (Co-Inventor: A. Ruocco.)
4. "Dynamic Memory Reclamation Without Programmer, Compiler or Linker Assistance". Filed by Northrop-Grumman. **US Patent #6,125,434.** September 26, 2000. (Co-Inventor: B. Willard.)
5. "Multiple Engine Information Retrieval and Visualization System". Filed by Harris Corporation. **US Patent #6,574,632.** June 3, 2003. (Co-Inventors: K. Fox, M. Knepper, J. Nemethy, E. Snowberg, G. Cusick, and R. Killam)
6. "Multiple Engine Information Retrieval and Visualization System". Filed by Harris Corporation. **US Patent #6,701,318.** March 2, 2004. (Co-Inventors: K. Fox, M. Knepper, J. Nemethy, E. Snowberg, G. Cusick, and R. Killam.)
7. "Optimal Placement of Wavelength Converters in Trees and Trees of Rings," Filed by the Illinois Institute of Technology. **US Patent #6,772,102.** August 3, 2004. (Co-Inventors: P-J Wan and L. Liu)
8. "Technique for Establishing a Virtual Backbone in an Ad Hoc Wireless Network," Filed by the Illinois Institute of Technology. **US Patent #6,839,541.** January 4, 2005. (Co-Inventors: Khaled Alzoubi and Peng-Jun Wan)
9. "Intranet Mediator," Filed by the Illinois Institute of Technology. **US Patent #6,904,428.** June 7, 2005. (Co-Inventor: David Grossman)
10. "Detection of Misuse of Authorized Access in an Information Retrieval System," Filed by the Illinois Institute of Technology. **US Patent #7,299,496.** November 20, 2007. (Co-Inventor: David Grossman)
11. "Automatic Generation of Document Summaries Through Use of Structured Text". Filed by Oracle Corporation. Pending application number 09/356,105, filed July 16, 1999. (Co-Inventor: N. Melander)
12. "System for Similar Document Detection". Filed by the IIT Research Institute. Pending application number 09/629,175, filed July 31, 2000. (Co-Inventor: A. Chowdhury)
13. "Method for the Construction and Utilization of a Medical Records System," Filed by the Illinois Institute of Technology. Pending application number 09/972,762, filed October 5, 2001 (Co-Inventor: Anthony Schaeffer)
14. "Process to Allocate Channels in a Sectorized Cellular Network," Filed by the Illinois Institute of Technology. Pending application number 10/114,786, filed April 3, 2002 (Co-Inventors: Vincent Nguyen and Peng-Jun Wan)
15. "Process to Allocate Channels in a Sectorized and Tiered Cellular Network," Filed by the Illinois Institute of Technology. Pending application number 10/160,481, filed May 31, 2002 (Co-Inventors: Vincent Nguyen and Peng-Jun Wan)
16. "Hardware Assisted Pruned Inverted Index Component," Filed by the Illinois Institute of Technology. Pending application number 10/470,613, filed August 1, 2003. (Co-Inventor: Salih Kagan Agun)
17. "System and Method for Providing User Input Information to Multiple Independent, Concurrent Applications," Filed by Snowshore Networks. Pending application number 10/785,501, filed February 24, 2004. (Co-Inventor: Eric Burger)
18. "Refined Permission Constraints Using Internal and External Data Extraction in a Role-Based Access Control System," Filed by the Illinois Institute of Technology. Pending application number 10/926,548, filed on August 26, 2004. (Co-Inventor: Shangping Ren)
19. "Intranet Mediator," Filed by the Illinois Institute of Technology. Pending application number 10/960,804, filed October 7, 2004. (Co-Inventor: David Grossman).
20. "Method for Re-Ranking Documents Retrieved from a Document Database." Patent filing by Harris Corporation. Pending application number 10/974,304, filed October 27, 2004. (Co-Inventors: Kevin Fox and Margaret Knepper.)
21. "Remote Control of Device by Telephone or Other Communication Devices," Filed by Snowshore Networks. Pending application number 11/258,575, filed October 25, 2005. (Co-Inventor: Eric Burger)

22. "Improved Peer-to-Peer File Sharing," Filed by the Illinois Institute of Technology. Pending application number 11/298,027, filed December 9, 2005. (Co-Inventor: Wai Gen Yee).
23. "Image-Based Indexing and Classification in Image Databases," Filed by the Illinois Institute of Technology. Pending application number 11/371,527, filed March 9, 2006. (Co-Inventor: Gad Agam).
24. "Method for Re-Ranking Documents Retrieved from a Multi-Lingual Document Database." Patent filing by Harris Corporation. Pending application number 11/279,473, filed April 12, 2006. (Co-Inventors: Kevin Fox and Margaret Knepper.)
25. "Method for Domain Identification of Documents Document Database." Patent filing by Harris Corporation. Pending application number 11/381,832, filed May 5, 2006. (Co-Inventors: Kevin Fox and Margaret Knepper.)
26. "Improved Peer-to-Peer File Sharing," Filed by the Illinois Institute of Technology. Pending application number 11/450,776, filed June 9, 2006. (Co-Inventor: Wai Gen Yee).
27. "Improved Peer-to-Peer File Sharing," Filed by the Illinois Institute of Technology. Pending application number 11/450,739, filed June 9, 2006. (Co-Inventor: Wai Gen Yee).
28. "Method for Improving Local Descriptors in Peer-to-Peer File Sharing", Filed by the Illinois Institute of Technology. Pending application number 11/602,039, filed November 20, 2006. (Co-Inventor: Wai Gen Yee).
29. "Hierarchical Structured Abstract File System," Filed by the Illinois Institute of Technology. Pending application number TBD, filed May 9, 2007. (Co-Inventors: Sanjiv Kapoor and Nandakiran Kirubanandan)
30. "Automated Forensic Document Signatures," Filed by Georgetown University. Pending application number TBD, filed on December 21, 2007. (Co-Inventors: T. Clay Shields and Marcus Maloof)

Books
1. T. Yap, O. Frieder, R. Martino, <u>High Performance Computational Methods for Biological Sequence Analysis</u>, Kluwer Academic Publishers, ISBN 0-7923-9724-X, 1996.
2. R. Shuey, D. Spooner, and O. Frieder, <u>The Architecture of Distributed Computer Systems: A Data Engineering Perspective</u>, Addison Wesley, ISBN 0-201-55332-5, 1997.
3. D. Grossman and O. Frieder, <u>Information Retrieval: Algorithms and Heuristics</u>, Kluwer Academic Publishers, ISBN 0-7923-8271-4, 1998. Second Edition 2004 by Springer Publishers, ISBN 1-4020-3003-7 (hardcover), 1-4020-3004-5 (paperback).

Journal Publications
1. O. Frieder and G. E. Herman, "Protocol Verification Using Database Technology," *IEEE Journal on Selected Areas in Communications,* 7(3), pp 324-334, April 1989.
2. C. K. Baru and O. Frieder, "Database Operations in a Cube-Connected Multicomputer System," *IEEE Transactions on Computers,* 38(6), pp 920-927, June 1989.
3. M. E. Segal and O. Frieder, "Dynamic Program Updating: Software Maintenance Technique for Minimizing Software Downtime," *Journal of Software Maintenance: Research and Practice,* Wiley Press, 1(1), pp 59-79, September 1989.
4. V. Mak, K. C. Lee, and O. Frieder, "Exploiting Parallelism in Pattern Matching: An Information Retrieval Application," *ACM Transactions on Information Systems*, 9(1), pp. 52-74, January 1991.
5. O. Frieder and M. E. Segal, "On Dynamically Updating a Computer Program: From Concept to Prototype," *Journal of Systems and Software,* Elsevier Science Publishing Co., North-Holland, 14(2), pp. 111-128, February 1991.
6. O. Frieder, "A Parallel Database-Driven Protocol Verification System Prototype," *Software Practice and Experience,* Wiley Press, 22(3), pp 245-264, March 1992.
7. M. R. Stytz and O. Frieder, "Dynamic Adaptive Surface Rendering Within a Distributed Memory Multiprocessor," *Journal of Systems and Software,* Elsevier Science Publishing Co., North-Holland, vol. 19, pp. 247-259, December 1992.
8. B. Kjell, W. A. Woods., and O. Frieder, "Discrimination of Authorship Using Visualization," *Information Processing and Management*, Pergamon Press, 30(1), pp. 141-150, January 1994.
9. O. Frieder and C. K. Baru, "Site Selection and Query Scheduling Policies for Multicomputer Database Systems," *IEEE Transactions on Knowledge and Data Engineering,* 6(4), pp. 609-619, August 1994.

10. F. Barlos and O. Frieder, "Join Workload Partitioning Under Uniform and Skewed Input Relations," *Parallel Processing Letters,* World Scientific Publishing Company, 4(1), pp. 95-104, August 1994.

11. K. Makki, N. Pissinou, and O. Frieder, "Efficient Solutions to Multicast Routing in Communication Networks," *ACM/Baltzer Mobile Networks and Applications (MONET),* 1(2), October 1996.

12. D. A. Grossman, O. Frieder, D. O. Holmes, and D. C. Roberts, "Integrating Structured Data and Text: A Relational Approach," *Journal of the American Society of Information Science*, 48(2), February 1997.

13. O. Frieder and H. Siegelmann, "Document Allocation in Multiprocessor Information Retrieval Systems," *IEEE Transactions on Knowledge and Data Engineering,* 9(4), July/August 1997.

14. A. Ruocco and O. Frieder, "Clustering and Classification of Large Document Bases in a Parallel Environment," *Journal of the American Society of Information Science*, 48(10), October 1997.

15. S. Nastea, O. Frieder, and T. El-Ghazawi, "Load Balanced Sparse Matrix-Vector Multiplication on Parallel Computers," *Journal of Parallel and Distributed Computing*, 46(2), November 1997.

16. T. Yap, O. Frieder, and R. Martino, "Parallel Computation in Biological Sequence Analysis," *IEEE Transactions on Parallel and Distributed Systems,* 9(3), March 1998.

17. C. Lundquist, O. Frieder, D. Holmes, and D. Grossman, "A Parallel Relational Database Management System Approach to Relevance Feedback in Information Retrieval," *Journal of the American Society of Information Science*, 50(5), April 1999.

18. K. Fox, O. Frieder, M. Knepper, and E. Snowberg, "SENTINEL: A Multiple Engine Information Retrieval and Visualization System," *Journal of the American Society of Information Science*, 50(7), May 1999.

19. P-J. Wan, G. Calinescu, L. Liu, and O. Frieder, "Grooming of Arbitrary Traffic in SONET/WDM Rings," *IEEE J. of Selected Area on Communication*, 18(10), October 2000.

20. G. Calinescu, O. Frieder, and P-J. Wan, "Minimizing Electronic Line Terminals for Automatic Ring Protection in General WDM Optical Networks," *IEEE J. of Selected Area on Communication*, 20(1), January 2002.

21. A. Chowdhury, O. Frieder, and P-J. Wan, "On the Design, Development, Deployment, and Network Survivability Analysis of the Dynamic Routing System Protocol," *Journal of Supercomputing,* 21(3), March 2002.

22. A. Chowdhury, O. Frieder, D. Grossman, and M. McCabe, "Collection Statistics for Fast Duplicate Document Detection," *ACM Transactions on Information Systems (TOIS)*, 20(2), April 2002.

23. O. Frieder, F. Harary, and P-J. Wan, "A Radio Coloring of a Hypercube," *International Journal of Computer Mathematics,* Taylor & Francis Publisher, 79(6), May 2002.

24. M. Aljlayl, O. Frieder, and D. Grossman, "On Bi-Directional English-Arabic Search," *Journal of the American Society of Information Science and Technology,* 53(13), November 2002.

25. P.-J. Wan, G. Calinescu, X.-Y. Li, and O. Frieder, "Minimum-Energy Broadcasting in Static Ad Hoc Wireless Networks," *ACM/Kluwer Wireless Networks (WINET)*, 8(6), November 2002.

26. V. Nguyen, P-J. Wan, and O. Frieder, "Channel Alternation and Rotation for Trisectorized Cellular Systems," *Journal of Telecommunication Systems*, 22(1), January/April 2003.

27. K. M. Alzoubi, X.-Y. Li, Y. Wang, P.-J. Wan, and O. Frieder, "Geometric Spanners for Wireless Ad-Hoc Networks," *IEEE Transactions on Parallel and Distributed Systems,* 14(4), April 2003.

28. X.-Y. Li, P.-J. Wan, and O. Frieder, "Coverage in Wireless Ad-Hoc Sensor Networks," *IEEE Transactions on Computers*, 52(6), June 2003.

29. P.-J. Wan, K. M. Alzoubi, and O. Frieder, "Distributed Construction of Connected Dominating Set in Wireless Ad Hoc Networks," *ACM/Kluwer Mobile Networks and Applications (MONET),* 9(2)*,* April 2004.

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153. M. C. McCabe, D. Holmes, K. Alford, A. Chowdhury, D. Grossman, and O. Frieder, "IIT at TREC-8: Improving Baseline Precision," *Overview of the Eighth Text Retrieval Conference (TREC-8),* NIST Special Publication 500-246, November 1999.

154. A. Chowdhury, S. Beitzel, E. Jensen, M. Sai-lee, D. Grossman, O. Frieder, M. C. McCabe, and D. Holmes, "IIT at TREC-9: Entity Based Feedback with Fusion," *Overview of the Ninth Text Retrieval Conference (TREC-9),* NIST Special Publication 500-249, November 2000.

155. M. Aljlayl, S. Beitzel, E. Jensen, A. Chowdhury, Holmes, M. Lee, D. Grossman, and O. Frieder, D. "IIT at TREC-10," *Overview of the Tenth Text Retrieval Conference (TREC-10),* NIST Special Publication 500-250, November 2001.

156. A. Chowdhury, M. Aljlayl, E. Jensen, S. Beitzel, D. Grossman, and O. Frieder, "IIT at TREC-2002: Linear Combinations Based on Document Structure and Varied Stemming for Arabic Retrieval," *Overview of the Eleventh Text Retrieval Conference (TREC-11),* NIST Special Publication 500-251, November 2002.

157. S. Beitzel, E. Jensen, R. Cathey, L. Ma, D. Grossman, O. Frieder, A. Chowdhury, G. Pass, H. Vandermolen, "IIT at TREC-2003: Task Classification & Document Structure for Known-Item Search", *Overview of the Twelfth Text Retrieval Conference (TREC-12),* NIST Special Publication 500-255, November 2003.

158. J. Heard, O. Frieder, and D. Grossman, "IIT at TREC 2004 Standard Retrieval Models Over Partitioned Indices for the Terabyte Track," *Overview of the Thirteenth Text Retrieval Conference (TREC-12),* NIST Special Publication 500-261, November 2004.

159. J. Urbain, N. Goharian, and O. Frieder, "IIT TREC 2005: Genomics Track," *Overview of the Fourteenth Text Retrieval Conference (TREC-12),* NIST Special Publication 500-266, November 2005.

160. J. Urbain, N. Goharian, and O. Frieder, "IIT TREC 2006: Genomics Track," *Overview of the Fifteenth Text Retrieval Conference (TREC-12),* NIST Special Publication 500-2XX, November 2006.

Acquired Funding[1]

1. "Multicomputer Relational Query Processing and its Application to Protocol Verification,"
   Database and Communication Systems, Inc./Virginia Center for Innovative Technology
   Principal Investigator (CCR-91-57785)
   January 1, 1991 - June 30, 1992 $ 37,093

2. "Parallel Verification Systems for Highly-Complex Communications Protocols,"
   National Science Foundation
   Principal Investigator
   September 1, 1991 - February 28, 1994 $ 54,998

3. "CISE Research Instrumentation:
       Exploiting Mixed Performance Characteristics: A Heterogeneous Hypercube System,"
   National Science Foundation ($ 57,100) / George Mason University ($ 28,550)
   (Principal Investigator: A. K. Sood, Co-Principal Investigator: O. Frieder)
   May 1, 1992 - October 31, 1993 $ 85,650

4. "Network Design and Optimization,"
   Telemarc, Inc./Virginia Center for Innovative Technology
   Principal Investigator
   February 10, 1993 - October 9, 1993 $ 25,000

5. "1993 National Young Investigator Award,"
   National Science Foundation
   Principal Investigator
   September 1, 1993 - February 28, 2000 $ 312,500

6. "Educating Engineers to Design Complex Systems,"
   National Science Foundation
   (Principal Investigator: P. Denning, Co-Principal Investigators: C. Dede, O. Frieder,
       J. Gentle, C. Jensen, M. Kafatos, D. Menasce', D. Rine, and J. Wallin)
   October 1, 1993 - September 30, 1995 $ 156,000

7. "High Performance Network Protocols and Information Retrieval Services,"
   XPAND Corporation/Virginia Center for Innovative Technology
   Principal Investigator
   October 18, 1993 - October 31, 1994 $ 38,839

8. "A Scientific and Technical Evaluation of EOSDIS Core System for Earth Science Research,"
   Hughes Applied Information Systems (HAIS)
   (Principal Investigator: M. Kafatos, Co-Principal Investigators: O. Frieder, L. Kerschberg,
       G. Michaels, B. Moore, D. Menasce', J. Shukla, and F. Webster)
   March 1, 1994 - August 31, 1994 $ 329,022

9. "Research Opportunity Award: Parallelism in Information Retrieval,"
   National Science Foundation
   Principal Investigator
   August 1, 1994 - July 31, 1995 $ 8,015

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[1] I did not pursue any funding prior to September 1990 since funding requests were forbidden at Bellcore.

10. "Implementing Relevance Ranking Using Logicon's LMDS,"
Logicon Operating Systems
Principal Investigator
October 12, 1994 - October 31, 1995 $ 39,615

11. The Telephone Connection, Inc. $ 85,633
Principal Investigator

     A. "High Transaction Volume Telecommunications Databases,"
         November 1, 1994 - October 31, 1995 $ 26,730
     B. "High Volume Call Processing,"
         July 1, 1995 - September 30, 1996 $ 29,403
     C. "Customized Telecommunication Access Patterns,"
         July 10, 1995 - October 31, 1995 $ 11,500
     D. "A Fault Tolerant Dynamic Routing System"
         May 26, 1996 - August 31, 1996 $ 18,000

12. Harris Corporation $ 113,008
Principal Investigator

     A. "Database and Data Processing Research"
         August 1, 1996 - May 14, 1997 $ 23,370
     B. "Information Systems Research"
         May 15, 1997 - June 30, 1997 $ 20,730
     C. "Integration of Text with Databases"
         July 1, 1997 - June 30, 1998 $ 68,908

13. IIT Research Institute (subcontracts from US Government grants) $ 322,698
Principal Investigator

     A. "EMPIRE: An Online Medical Library"
         US Army (subcontract)
         October 1, 1998 - March 29, 2000   ($75,000 & $116,699) $ 191,699
     B. "On the Design of an Alternative Medicine Information Retrieval System"
         National Institutes of Health - NCCAM (subcontract)
         October 1, 1998 - September 30, 1999   ($40,000 & $66,000) $ 106,000
     C. "Data Warehouse Scalability Study"
         January 1, 2000 - June 30, 2000 $ 24,999

14. "An Educational Metasearch Engine,"
Sun Microsystems, Inc.
(Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
June 1, 2000 - May 31, 2001 $ 39,400

15. "User Interface Design for a Scalable Data Warehouse,"
Hitech Component Distributors (HiTechCafe.com)
(Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
August 1, 2000 - July 31, 2001 $ 94,000

16. "Research Infrastructure for Distributed System Development"
DARPA
(Principal Investigator: X. Sun, Co-Principal Investigators: O. Frieder, P. Dickens, C. Hood, H. Zhang)
January 1, 2001 - December 31, 2002 $ 173,000

17. "Next Generation Search of the World Wide Web,"
    Hitech Component Distributors (HiTechCafe.com)
    (Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
    August 1, 2001 - July 31, 2003 $ 600,000

18. "Acquisition of a Computing Cluster and Access Grid Node for Information Technology Research"
    National Science Foundation
    (Principal Investigator: X. Sun, Co-Principal Investigators: O. Frieder, P. Dickens, C. Hood, H. Zhang)
    September 15, 2001 - August 31, 2003 $ 175,333

19. "Textual-Geospatial Integration Services for NSDL"
    National Science Foundation (sub-contract from UCSB – Terry Smith, Principal Investigator)
    (Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
    October 1, 2001 - September 30, 2003 $ 152,205

20. "University Research Outreach: Information Technology Tools"
    In-Q-Tel
    (Principal Investigator: D. Grossman, Co-Principal Investigator: O. Frieder)
    February 7, 2002 – February 6, 2003 $155,213

21. "Lockheed Martin Subcontract RRMCS0753 - JAILYARD Program"
    Lockheed Martin
    (Principal Investigator: D. Grossman, Co-Principal Investigator: O. Frieder)
    October 3, 2002 – October 1, 2004 $263,642

22. "Arabic Stemmer License Agreement"
    Blue Shoe Technologies
    (Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
    June 1, 2003 – September 30, 2004 $64,000

23. "Extending CS Undergraduate Curriculum to Include Data Mining and Information Retrieval"
    National Science Foundation
    (Principal Investigator: Ophir Frieder, Co-Principal Investigators: N. Goharian, D. Grossman, N. Raju)
    September 1, 2001 - July 31, 2005 $ 339,500

24. "Collaborative Project: Completing a Center of Excellence in Information Assurance at IIT"
    National Science Foundation
    (Principal Investigator: D. Grossman, Co-Principal Investigator: O. Frieder)
    August 1, 2003 - July 31, 2005 $ 144,000

25. "Research Support for Doctoral Students"
    America Online
    (Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
    September 1, 2003 – August 31, 2006 $192,000

26. "CRCD/EI: An Undergraduate CS Specialization in Knowledge Management Systems"
    National Science Foundation
    (Principal Investigator: S. Argamon, Co-PI: O. Frieder, N. Goharian, D. Grossman, N. Raju)
    October 1, 2004 – September 30, 2007 $281,999

27. BitSystems, Inc. (subcontracts from US Government grants) $ 985,000
(Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)

    A. "A Scalable Search Engine"
       August 1, 2000 - July 31, 2001 $ 30,000
    B. "Using a Relational DBMS to Implement an XML Query Language"
       January 1, 2001 - September 30, 2001 $ 60,000
    C. "Using a Relational DBMS to Implement an XML Query Language: Phase II"
       July 1, 2001 - September 30, 2001 $ 60,000
    D. "Using a Relational DBMS to Implement an XML Query Language: Phase III"
       October 1, 2001 – September 30, 2002 $ 120,000
    E. "Using a Relational DBMS to Implement an XML Query Language: Phase IV"
       October 1, 2002 – September 30, 2003 $ 120,000
    F. "Using a Relational DBMS to Implement an XML Query Language: Phase V"
       October 1, 2003 – September 30, 2004 $ 120,000
    G. "Using a Relational DBMS to Implement an XML Query Language: Phase VI"
       October 1, 2004 – September 30, 2008 $ 475,000

28. "Search Scalability Evaluation"
Northrop-Grumman – subcontract from the "Survivor Program"
(Principal Investigator: D. Grossman, Co-Principal Investigator: O. Frieder)
September 24, 2004 – September 30, 2005 $120,000

29. "Complex Document Information Processing"
ARDA
(Principal Investigator: O. Frieder, Co-Principal Investigators: G. Agam, S. Argamon, and D. Grossman)
March 12, 2005 – September 30, 2007 $ 1,295,000

30. "Knowledge Dissemination and Discovery ("KDD") Challenge Problem Evaluation"
IBM
(Principal Investigator: S. Argamon, Co-Principal Investigators: O. Frieder and D. Grossman)
July 1, 2005 – September 30, 2005 $ 61,575

31. "KDD Intranet Mediation"
National Science Foundation – Supplement
(Principal Investigator: O. Frieder, Co-Principal Investigators: G. Agam, S. Argamon, and D. Grossman)
August 1, 2006 – July 31, 2007 $ 175,000

32. "Information Retrieval on a Parallel Database Machine"
Netezza Corporation – Equipment Grant
(Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
October 1, 2007 – September 30, 2008 $ 291,400

33. "On the Scalability of Search Systems"
Advanced Systems Engineering Corporation
(Principal Investigator: O. Frieder, Co-Principal Investigator: D. Grossman)
February 1, 2008 – September 30, 2009 $ 300,000