

# Gregory (Grisha) V. Chockler

Curriculum Vitae

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## Education

- Ph. D.** Computer Science, Hebrew University of Jerusalem  
Thesis: [38], Supervisor: Prof. Dahlia Malkhi September 2003
- M. Sc.** Computer Science, Hebrew University of Jerusalem,  
*Magna cum laude* November 1997  
Thesis: [39], Supervisor: Prof. Danny Dolev
- B. Sc.** Computer Science, Hebrew University of Jerusalem, *Cum laude* 1993

## Research Interests

All areas of distributed computing and systems, and in particular, scalable and highly available distributed systems and middleware; scalable pub/sub systems; peer-to-peer computing and content distribution; wireless, mobile, ad-hoc, sensor networks; fault-tolerance; fundamental issues in distributed computing; storage systems; formal models and verification of distributed systems; group communication; distributed object systems and middleware.

## Professional Experience

- IBM Research 2005 - present  
Research Scientist at Haifa Research Lab, Israel  
Scalable Distributed Middleware Systems (technical lead)
- MIT Computer Science and Artificial Intelligence Laboratory (MIT/CSAIL) 2003 - 2005  
Postdoctoral Associate  
Theory of Distributed Systems group
- IBM Research 2002 - 2003  
Research Scientist at Haifa Research Lab, Israel  
Research in network-based storage systems.

School of Computer Science and Engineering, Hebrew University Adjunct Lecturer	2001 - 2003
School of Computer Science and Engineering, Hebrew University Research Assistant and Teaching Assistant (1995 - 2000)	1995 - 2000
Bell Labs, Lucent Technologies, Murray Hill, NJ, USA Summer Intern	July - September, 2000
The SELA IT Training group Lectured on UNIX System Programming (part time)	2000 - 2001
The Open University, Tel-Aviv, Israel Instructed the Compiler Construction course (part time)	1994-1995
Cognitive Electrophysiology Lab, Hebrew University of Jerusalem UNIX System administrator and programmer (part time)	1993 - 1995
News Datacom Research Ltd UNIX system support (summer employee)	June - September, 1992

## Scientific Lectures

Since 1996, Dr. Chockler has delivered numerous scientific lectures at scientific symposia, leading universities, and industrial research institutions. Below is a sample of noteworthy invited lectures.

- *Towards a Peer-to-Peer Middleware Platform for Scalable and Resilient Service-Oriented Computing*, keynote address, the 2nd ESFORS Workshop on Software and Service Development, Security, and Dependability, July 10–11, 2007, Maribor, Slovenia.
- *Fault-Tolerant Computing in Wireless Networks*, invited tutorial at the 1st European Summer School on Knowledge Discovery for Ubiquitous Computing, September 14–16, 2006, University of Dortmund, Germany.
- *On the Space Requirements of Robust Storage Implementations*, invited talk, Dagstuhl Seminar From Security to Availability, September 10–15, 2006, Dagstuhl, Germany.
- *Optimal Resilience Wait-Free Storage from Byzantine Components: Inherent Costs and Solutions*, invited talk, Summer Research Institute, The Swiss Federal Institute of Technology Lausanne (EPFL), July 2004, Lausanne, Switzerland.

## Academic service

Students advised

- Calvin Newport, MIT/CSAIL, M.Sc. 2006. Thesis: Consensus and Collision Detectors in Wireless Ad Hoc Networks. Co-advised with Nancy Lynch.

Teaching

- Principles of Distributed Fault-Tolerance, Fall semester 2004, MIT.
- Operating Systems, Fall and Spring semesters, 2002, Hebrew University.
- Topics in Distributed Middleware Systems, Spring semester 2001, Hebrew University.

## Professional Service

### Conference program committees

- 2008 International Symposium on Distributed Objects, Middleware, and Applications (DOA 2008).
- 2008 ACM Symposium on Principles of Distributed Computing (PODC 2008).
- 2008 International Conference on Distributed Computing Systems, (ICDCS 2008): Wireless and Mobile Computing Track.
- 2008 International Conference on Distributed Event-Based Systems (DEBS 2008).
- 2008 International Service Availability Symposium (ISAS 2008).
- 2007 International Symposium on Distributed Objects, Middleware, and Applications (DOA 2007).
- 2007 International Conference on Autonomic Computing and Communication Systems (Autonomics 2007).
- 2006 ACM Symposium on Principles of Distributed Computing (PODC 2006)
- 2005 International Conference on Distributed Computing Systems, (ICDCS 2005): Fault-Tolerant and Dependable Computing Track
- 2004 ACM Symposium on Principles of Distributed Computing (PODC 2004)

### Other conference service

- Co-organizer, International Workshop on Large-Scale Distributed Systems and Middleware (LADIS 2007)
- Local arrangements chair, ACM Symposium on Principles of Distributed Computing (PODC 2005)

### Reviewer

- Conferences: ACM PODC, IEEE ICDCS, IEEE DSN
- Journals: JACM, IEEE TSE, ACM TOCS, ACM Computing Surveys, SIAM Journal of Computing, ACM Distributed Computing.

### Membership in professional organizations

- ACM Professional Member
- Co-chair, IBM Professional Interest Community on Distributed and Fault-Tolerant Computing

## Awards and Honors

Awards for scientific papers:

- Middleware 2000 Best Paper Award, by The Technical Committee 6 (TC6) of the International Federation for Information Processing (IFIP), 2000 (for [28])
- Middleware 2000 Best Student Paper Award, by Agilent Technologies, 2000 (for [28])

Papers invited from the following conferences to appear in journals:

- 2002 ACM Symposium on Principles of Distributed Computing (PODC'02), [23] invited, appears as [6]

Scholarships, fellowships, and research awards:

- Porat Scholarship for doctoral students, 2001.
- Scholarship for doctorate students, by Israel Committee for Planning and Budgeting (VATAT), 1999.

## Development Projects and Software Releases

- **Transis**: multicast communication layer that facilitates the development of fault tolerant distributed applications in a network of machines. Available for download under the GPL/LGPL license at <http://www.cs.huji.ac.il/labs/transis/software.html>. Developed jointly with Dahlia Malkhi.
- **Aquarius**: Fault-tolerant CORBA implementation developed under my supervision as a part of my doctorate work. See <http://www.cs.huji.ac.il/labs/danss/aquarius> and [22] for more information
- **CASCADE**: A distributed caching service for CORBA objects. Featured a dynamically built hierarchy of cached object copies. Discussed in the "Distributed Systems Principles and Paradigms" textbook by Tanenbaum and van Steen. See <http://dsl.cs.technion.ac.il/projects/cascade/default.htm> and [28,27,7] for more information.

## Publications

### Journal and Magazine Articles

- [1] Consensus and Collision Detectors in Radio Networks. Gregory Chockler, Murat Demirbas, Seth Gilbert, Nancy Lynch, Calvin Newport, and Tina Nolte. Accepted to Distributed Computing (2008).
- [2] Reliable Distributed Storage. Gregory Chockler, Rachid Guerraoui, Idit Keidar, and Marko Vukolić. Accepted to IEEE Computer (2008).
- [3] Wait-Free Regular Storage from Byzantine Components. Ittai Abraham, Gregory Chockler, Idit Keidar, and Dahlia Malkhi. Information Processing Letters 101(2): 60-65 (2007).

- [4] Byzantine Disk Paxos: Optimal Resilience with Byzantine Shared Memory. Ittai Abraham, Gregory Chockler, Idit Keidar and Dahlia Malkhi. *Distributed Computing* 18(5), pages 387-408, April 2006, Springer.
- [5] Light-Weight Leases for Storage-Centric Coordination. Gregory Chockler and Dahlia Malkhi. *International Journal of Parallel Programming (IJPP)* 34(2): 143-170 (2006).
- [6] Active Disk Paxos with infinitely many processes. Gregory Chockler and Dahlia Malkhi. *Distributed Computing* 18(1): 73-84 (2005), Springer. (A special issue dedicated to selected papers appearing in PODC 2002).
- [7] On the Composability of Consistency Conditions. Gregory Chockler, Roy Friedman, and Roman Vitenberg, *Information Processing Letters* 86(4): 169-176 (2003).
- [8] Group Communication Specification: A Comprehensive Study, Gregory Chockler, Idit Keidar and Roman Vitenberg, In *ACM Computing Surveys* 33(4), pages 1-43, December 2001.

## Chapter in Books

- [9] A Data-Centric Approach for Scalable State Machine Replication, Gregory Chockler, Dahlia Malkhi and Danny Dolev. In *Future Directions in Distributed Computing, Lecture Notes in Computer Science Volume 2584*, Springer-Verlag, 2003. Edited by Ben Zhao, Andre Schiper, Alex Shvartsman and Hakim Weatherspoon.

## Refereed Conferences and Workshops

- [10] Constructing Scalable Overlays for Pub/Sub with Many Topics. Problems, Algorithms, and Evaluation. Gregory Chockler, Roie Melamed, Yoav Tock, and Roman Vitenberg. In *Proceedings of the 26th ACM Symposium on Principles of Distributed Computing (PODC'07)*, August 12-15, 2007, Portland, Oregon, USA.
- [11] SpiderCast: A Scalable Interest-Aware Overlay for Topic-Based Pub/Sub Communication. Gregory Chockler, Roie Melamed, Yoav Tock, and Roman Vitenberg. In *Proceedings of the Inaugural International Conference on Distributed Event-Based Systems (DEBS'07)*, June 20-22, 2007, Toronto, Canada.
- [12] Amnesic Distributed Storage. Gregory Chockler, Rachid Guerraoui, Idit Keidar. In *Proceedings of the 21st International Symposium on Distributed Computing (DISC'07)*, September 24-26, 2007, Lemesos, Cyprus. Published by Springer-Verlag GmbH in *Lecture Notes in Computer Science*, Volume 4731, 2007, Pages 139 - 151.
- [13] Local Building Blocks for a Scalable Pub/Sub Infrastructure. Alex Shraer, Sivan Bercovici, Gregory Chockler, Idit Keidar, Roie Melamed, Yoav Tock, Roman Vitenberg. *The Second Workshop on Locality Preserving Distributed Computing Methods (LOCALITY 2007)*.
- [14] Local On-Line Maintenance of Scalable Pub/Sub Infrastructure. Alex Shraer, Gregory Chockler, Idit Keidar, Roie Melamed, Yoav Tock, Roman Vitenberg. *The 37th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2007)*, June 25 - June 28, 2007, Edinburg, UK. Fast abstract.

- [15] Communication-Efficient Probabilistic Quorum Systems for Sensor Networks. Gregory Chockler, Seth Gilbert, and Boaz Patt-Shamir. In Proceedings of the IEEE International Workshop on Foundations and Algorithms for Wireless Networking (FAWN'06), March 13, 2006, Pisa, Italy.
- [16] Reconfigurable Distributed Storage for Dynamic Networks. Gregory Chockler, Seth Gilbert, Vincent Gramoli, Peter Musial, and Alexander Shvartsman. In Proceedings of the 9th International Conference on Principles of Distributed Systems (OPODIS'05), December 12-14, 2005, Pisa, Italy.
- [17] Proving Atomicity: An Assertional Approach. Gregory Chockler, Nancy Lynch, Sayan Mitra, and Joshua Tauber. In Proceedings of the 19th International Symposium on Distributed Computing (DISC'05), September 26-28, 2005, Krakow, Poland. Published by Springer-Verlag GmbH in Lecture Notes in Computer Science, Volume 3724, Oct 2005, Pages 152 - 168
- [18] Consensus and Collision Detectors in Wireless Ad Hoc Networks. Gregory Chockler, Murat Demirbas, Seth Gilbert, Calvin Newport and Tina Nolte. In Proceedings of the 24th ACM Symposium on Principles of Distributed Computing (PODC'05), July 17-20, 2005, Las Vegas, Nevada, USA.
- [19] Reconciling the Theory and Practice of (Un)Reliable Wireless Broadcast. Gregory Chockler, Murat Demirbas, Seth Gilbert, Nancy Lynch, Calvin Newport and Tina Nolte. In Proceedings of the 4th Workshop on Assurance in Distributed Systems and Networks (ADSN'05), June 6, 2005, Columbus, Ohio, USA.
- [20] Byzantine Disk Paxos: Optimal Resilience with Byzantine Shared Memory. Ittai Abraham, Gregory Chockler, Idit Keidar and Dahlia Malkhi. In Proceedings of the 23rd ACM Symposium on Principles of Distributed Computing (PODC'04), July 25-28, 2004, St. John's, Newfoundland, Canada.
- [21] Optimal Resilience Wait-Free Storage from Byzantine Components: Inherent Costs and Solutions. Gregory Chockler, Idit Keidar and Dahlia Malkhi. FuDiCo II: S.O.S. Survivability: Obstacles and Solutions. 2nd Bertinoro Workshop on Future Directions in Distributed Computing, 23-25 June 2004 University of Bologna Residential Center Bertinoro (Forl), Italy.
- [22] Aquarius: A Data-Centric approach to CORBA Fault-Tolerance. Gregory Chockler, Dahlia Malkhi, Barak Merimovich and David Rabinowitz. The Workshop on Reliable and Secure Middleware, in Proceedings of the 2003 International Conference on Distributed Objects and Applications (DOA), Sicily, Italy, November 2003.
- [23] Active Disk Paxos with infinitely many processes, Gregory Chockler and Dahlia Malkhi, In Proceedings of the 21st ACM Symposium on Principles of Distributed Computing (PODC'02), July 20-24, 2002, Monterey, California, USA.
- [24] State-Machine Replication with Infinitely Many Processes: A position Paper, G. Chockler, D. Malkhi and D. Dolev, In Proceedings of the International Workshop on Future Directions in Distributed Computing (FuDiCo), Bertinoro, Italy, 2002.

- [25] Quorum Based Approach to CORBA Fault-Tolerance, Gregory Chockler, Dahlia Malkhi and Danny Dolev, In Proceedings of the European Research Seminar in Advanced Distributed Systems (ERSADS'01), University Residential Center of University of Bologna, Bertinoro (Forl) , Italy. 4-18 May 2001.
- [26] Backoff Protocols for Distributed Mutual Exclusion and Ordering, by G. Chockler, D. Malkhi and M. K. Reiter . In Proceedings of the 21st International Conference on Distributed Computing Systems (ICDCS-21), Apr 16-19, 2001, Phoenix, Arizona, USA.
- [27] Consistency Conditions for a CORBA Caching Service e, by G. Chockler, R. Friedman and R. Vitenberg. In Proceedings of the 14th International Symposium on DIStributed Computing (DISC'2000), Oct 4-6, 2000, Toledo, Spain.
- [28] Implementing Caching Service for Distributed CORBA Objects, by G. Chockler, R. Vitenberg, R. Friedman, D. Dolev. In Proceedings of IFIP/ACM International Conference on Distributed Systems Platforms and Open Distributed Processing (Middleware'2000), 3rd - 7th April 2000, IBM Palisades Executive Conference Center, Hudson River Valley, NY, USA. **Best paper award.**
- [29] An Adaptive Totally Ordered Multicast Protocol that Tolerates Partitions, by G. Chockler, N. Huleihel, D. Dolev. In Proceedings of the Seventeenth ACM Symposium on Principles of Distributed Computing (PODC'98), June 28 - July 2 1998, Puerto Vallarta, Mexico.
- [30] TransMIDI: A System for MIDI Sessions Over the Network Using Transis, by D. Gang, G. Chockler, T. Anker, A. Kremer, T. Winkler. In Proceedings of the International Computer Music Conference (ICMC'97), September 1997, Thessaloniki, Greece.
- [31] The Caelum Toolkit for CSCW: The Sky is the Limit, by T. Anker, G. Chockler, D. Dolev, I. Keidar. In Proceedings of the Third International Workshop on Next Generation Information Technologies and Systems (NGITS'97), Neve-Ilan, Israel, June, 1997.
- [32] Exploiting Group Communication for Highly Available Video-On-Demand Services, by T. Anker, G. Chockler, I. Keidar, M. Rozman, J. Wexler. In Proceedings of the IEEE 13th International Conference on Advanced Science and Technology (ICAT 97) and the 2nd International Conference on Multimedia Information Systems (ICMIS 97), April 1997, pages 265-270.
- [33] Efficient State Transfer in Partitionable Environments , by Y. Amir, G. Chockler, R. Vitenberg, and D. Dolev. In Proceeding of the 2nd European Research Seminar in Advanced Distributed Systems (ERSADS'97), Zinal (Valais, Switzerland), March 17-21, 1997.
- [34] Multimedia Multicast Transport Service for Groupware , by G. Chockler, N. Huleihel, I. Keidar, and D. Dolev. In Proceedings of the TINA Conference on the Convergence of Telecommunications and Distributed Computing Technologies, September 1996, pages 43-54.
- [35] Group Communication as an Infrastructure for Distributed System Management, by Y. Amir, D. Breitgand, G. Chockler, D. Dolev. In Proceedings of the Third International Workshop on Services in Distributed and Networked Environment 1996, (SDNE'96).

## Invited Papers

- [36] A Middleware Framework for Robust Applications in Wireless Ad Hoc Networks by Gregory Chockler, Murat Demirbas, Seth Gilbert, and Calvin Newport Proceeding of the 43rd Allerton Conference on Communication, Control, and Computing, September, 2005
- [37] Scalable Group Membership Services for Novel Applications, by T. Anker, G. Chockler, D. Dolev, I. Keidar. In the DIMACS book series, proceedings of the workshop on Networks in Distributed Computing. Edited by: Marios Mavronicolas, Michael Merritt, and Nir Shavit.

## Other Reviewed Publications

- [38] Fault-Tolerance in Storage-Centric Systems, by Gregory Chockler. PhD Thesis, School of Computer Science and Engineering, The Hebrew University of Jerusalem, Israel. September 2003.
- [39] An Adaptive Totally Ordered Multicast Protocol that Tolerates Partitions. MSc Thesis, Department of Computer Science, The Hebrew University of Jerusalem, Israel. 1997.

## In Submission/In Progress

- [40] Consensus and Collision Detectors in Wireless Ad Hoc Networks, by Gregory Chockler, Murat Demirbas, Seth Gilbert, Nancy Lynch, Calvin Newport, and Tina Nolte. Submitted for a journal publication.
- [41] Reconfigurable Distributed Storage for Dynamic Networks. Gregory Chockler, Seth Gilbert, Vincent Gramoli, Peter Musial, and Alexander Shvartsman. Submitted for a journal publication.

## Technical Reports

- [42] Wait-free Regular Storage from Byzantine Components. Ittai Abraham, Gregory Chockler, Idit Keidar, Dahlia Malkhi. Technical Report MIT-LCS-TR-984. Computer Science and Artificial Intelligence Laboratory, Cambridge MA 02139, MIT. April 5, 2005.
- [43] Light-Weight Leases for Storage-Centric Coordination. Gregory Chockler and Dahlia Malkhi. Technical Report MIT-LCS-TR-934, MIT Laboratory for Computer Science, Cambridge MA 02139, 2004.
- [44] Group Communication Specifications: A Comprehensive Study, by G. Chockler, D. Dolev, I. Keidar, R. Vitenberg. Technical Report MIT-LCS-TR-790, Massachusetts Institute of Technology, Laboratory for Computer Science, Technical Report CS99-31, Institute of Computer Science, The Hebrew University of Jerusalem and Technical Report CS0964, Computer Science Department, the Technion, Haifa, Israel.
- [45] The Design and Performance of Xpand: A Group Communication System for Wide Area Networks, Tal Anker, Gregory V. Chockler, Ilya Shnaiderman, Danny Dolev, Technical Report CS2001-56, Institute of Computer Science, The Hebrew University of Jerusalem.



- [46] The Design of Xpand: A Group Communication System for Wide Area Networks, Tal Anker, Gregory V. Chockler, Ilya Shnaiderman, Danny Dolev, Technical Report CS2000-31, Institute of Computer Science, The Hebrew University of Jerusalem.
- [47] Supporting Multiple Quality of Service Options with High Performance Groupware, by G. Chockler, N. Huleihel, I. Keidar, and D. Dolev. Technical Report CS96-3, Institute of Computer Science, The Hebrew University of Jerusalem, March 1996.

## Patents

- [48] *Constructing Scalable Overlays for Pub-Sub with Many Topics: The Greedy Join-Leave Algorithm*, by Gregory Chockler, Roie Melamed, and Yoav Tock, US patent application, under filing.
- [49] *Multicasting in a Communication Network*, by Gregory Chockler, Roie Melamed, Yoav Tock, and Roman Vitenberg, US patent application, filed October 2007.
- [50] *Backoff protocols and methods for distributed mutual exclusion and ordering*, by Gregory Chockler, Dahlia Malkhi, and Michael Reiter, US patent 7155524, issued December 2006.