Massachusetts Institute of Technology — Handout 3
6.852: Distributed Algorithms
Prof. Nancy Lynch — September 8, 2005

Supplementary Reading List

1 Other general distributed algorithms textbooks

[1] Hagit Attiya and Jennifer Welch. *Distributed Computing: Fundamentals, Simulations, and Advanced Topics*. John Wiley and Sons, Inc., 2004. Second Edition.

2 The number of rounds required for consensus

[1] Marcos Kawazoe Aguilera and Sam Toueg. A simple bivalency proof that t-resilient consensus requires $t + 1$ rounds. *Information Processing Letters*, 71(3-4):155-158, August 1999.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/IPL-AguileraToueg.pdf.`

[2] Idit Keidar and Sergio Rajsbaum. On the cost of fault-tolerant consensus when there are no faults -a tutorial. Technical Report MIT-LCS-TR-821, May 2001. Preliminary version in *SIGACT News*, 32(2):45-63, Distributed Computing column, June 2001 (published in May 15th).
`http://theory.lcs.mit.edu/classes/6.852/05/papers/TR821.ps.`

3 Minimum spanning tree protocol

[1] R. G. Gallager, P. A. Humblet, and P. M. Spira. A distributed algorithm for minimum-weight spanning trees. *ACM Trans. Programming Language Syst.*, vol. 5, pp. 66–77, 1983.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p66-gallager.pdf.`

4 Vector timestamps

[1] Friedemann Mattern. Virtual time and global states of distributed systems. In Michel Cosnard et al., editors, *Parallel and Distributed Algorithms: Proceedings of the International Workshop on Parallel and Distributed Algorithms* (Chateau de Bonas, Gers, France, October, 1988), pages 215–226. North Holland, 1989. (Reprinted in: Z. Yang, T.A. Marsland (Eds.), "Global States and Time in Distributed Systems", IEEE, 1994, pp. 123-133.)
`http://theory.lcs.mit.edu/classes/6.852/05/papers/VirtTimeGlobStatesFull.pdf.`

[2] Colin Fidge. Logical time in distributed computing systems. *IEEE Computer*, 24(8):28–33, August 1991.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/ieeecomputer.pdf.`

5 Impossibility of consensus

[1] Michael J. Fischer, Nancy A. Lynch, and Michael S. Paterson. Impossibility of Distributed Consensus with One Faulty Process. *Journal of the ACM*, 32(2):374-382, April 1985.
`http://theory.lcs.mit.edu/tds/papers/Lynch/jacm85.pdf.`

[2] Soma Chaudhuri. More *Choices* Allow More *Faults*: Set Consensus Problems in Totally Asynchronous Systems. *Information and Computation* 105 (1), pp. 132-158, July 1993.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/Chaudhuri.pdf`.

6 Wait-free computability and the wait-free consensus hierarchy

[1] Maurice Herlihy. Wait-free synchronization. *ACM Transactions on Programming Languages and Systems*, 13(1):124–149, January 1991.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p124-herlihy.pdf`.

[2] Prasad Jayanti. Robust wait-free hierarchies. *Journal of the ACM*, 44(4): 592-614, 1997.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p592-jayanti.pdf`.

[3] Prasad Jayanti. Wait-free computing. In Jean-Michel Hélary, Michel Raynal (Eds.): *Distributed Algorithms, 9th International Workshop, WDAG '95, Le Mont-Saint-Michel, France, September 13-15, 1995, (Proceedings)*, volume 972 of *Lecture Notes in Computer Science*, Springer 1995.
Online version not available.

[4] Wai-Kau Lo and Vassos Hadzilacos. All of us are smarter than any of us: nondeterministic wait-free hierarchies are not robust. *SIAM Journal on Computing*, 30(3):689–728, 2001.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p689-lo.ps`.

7 Wait-free vs. f-fault-tolerant data objects

[1] T.D. Chandra, V. Hadzilacos, P. Jayanti and S. Toueg. Wait-freedom vs. t-resiliency and the robustness of the h_m^r hierarchy. *Proceedings of the 13th ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing*, pages 334-343, Los Angeles, CA, August 1994.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p334-chandra.pdf`.

[2] T.D. Chandra, V. Hadzilacos, P. Jayanti and S. Toueg. Generalized irreducibility of consensus and the equivalence of t-resilient and wait-free implementations of consensus. To appear in *SIAM Journal on Computing*.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/CHJT.ps`.

[3] Elizabeth Borowsky, Eli Gafni, Nancy Lynch, and Sergio Rajsbaum. The BG distributed simulation algorithm. *Distributed Computing*, 14:127-146, 2001.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/bg-dist-sim.pdf`.

[4] W.K. Lo and V. Hadzilacos. On the power of shared object types to implement one-resilient consensus. *Distributed Computing*, 13(4):219–238, 2000.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p219-lo.pdf`.

[5] Paul Attie, Rachid Guerraoui, Petr Kouznetsov, Nancy Lynch, and Sergio Rajsbaum. Impossibility of boosting distributed service resilience. Technical Report MIT-LCS-TR-982, MIT CSAIL, Cambridge, MA, February 2005.
`http://theory.lcs.mit.edu/tds/papers/Attie/boosting-tr.ps`.

8 Reliable broadcast

[1] Vassos Hadzilacos and Sam Toueg. Fault-tolerant broadcasts and related problems. In Sape Mullender, editor, *Distributed Systems*, chapter 5, pages 97–145. ACM Press and Addison-Wesley, 1993. Second Edition.

[2] V. Hadzilacos and S. Toueg. A modular approach to the specification and implementation of fault-tolerant broadcasts. Technical Report TR94-1425, Department of Computer Science, Cornell University, Ithaca NY, May 1994.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/TR94-1425.ps.`

9 Failure detectors and consensus

[1] Tushar Deepak Chandra and Sam Toueg. Unreliable failure detectors for reliable distributed systems. *Journal of the ACM*, 43(2):225–267, March 1996.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/CT96-JACM.ps.`

[2] Tushar Deepak Chandra, Vassos Hadzilacos, and Sam Toueg. The weakest failure detector for solving consensus. *Journal of the ACM*, 43(4):685–722, July 1996.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/jacm96.pdf.`

[3] Eli Gafni. A Round-by-Round Failure Detector - Unifying Synchrony and Asynchrony. *Proceedings of the 17th Annual ACM Symposium on Principles of Distributed Computing*, Puerto Vallarta, Mexico, pages 143-152, June 1998.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p143-gafni.pdf.`

[4] L. Lamport. The part-time parliament. *ACM Transactions on Computer Systems*, 16(2):133–169, May 1998. Also Research Report 49, Digital Equipment Corporation Systems Research Center, Palo Alto, CA, September 1989.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/lamport-paxos.ps.`

10 Self-stabilization

[1] Edsger W. Dijkstra. Self-stabilizing systems in spite of distributed control. *Communications of the ACM*, 17(11):643–644, November 1974.
`http://theory.lcs.mit.edu/classes/6.852/05/papers/p643-Dijkstra.pdf.`

[2] Shlomi Dolev. *Self-Stabilization*. MIT Press, 2000.

11 Clock synchronization

[1] Hagit Attiya and Jennifer Welch. *Distributed Computing: Fundamentals, Simulations, and Advanced Topics*. John Wiley and Sons, Inc., 2004. Second Edition.

[2] Rui Fan and Nancy Lynch. Gradient Clock Synchronization. *Proceedings of the Twenty-third Annual ACM PODC*. St. Johns, Newfoundland, Canada, July 2004.
`http://theory.lcs.mit.edu/tds/papers/Fan/podc04.ps.`

12 Dynamic distributed algorithms

[1] Nancy Lynch and Alex Shvartsman. RAMBO: A reconfigurable atomic memory service for dynamic networks. Technical Report MIT-LCS-TR-856, MIT Laboratory for Computer Science, Cambridge, MA, 2002.
`http://theory.lcs.mit.edu/tds/papers/Lynch/rambo-tr.ps.`

[2] Seth Gilbert, Nancy Lynch, and Alex Shvartsman. RAMBO II: Rapidly reconfigurable atomic memory for dynamic networks. *Proceedings of the International Conference on Dependable Systems and*

Networks (DSN), San Francisco, CA, pages 259-268, June 22nd - 25th, 2003. Also, Technical Report MIT-LCS-TR-890, MIT CSAIL, Cambridge, MA, 2004.
http://theory.lcs.mit.edu/tds/papers/Gilbert/TR-890.ps.

[3] Shlomi Dolev, Seth Gilbert, Nancy Lynch, Alex Shvartsman, and Jennifer Welch. GeoQuorums: Implementing atomic memory in ad hoc networks. Technical Report MIT-LCS-TR-900a, MIT CSAIL, Cambridge, MA, 2004.
http://theory.lcs.mit.edu/tds/papers/Gilbert/TR-900a.ps.

[4] Shlomi Dolev, Seth Gilbert, Nancy A. Lynch, Elad Schiller, Alex A. Shvartsman, and Jennifer L. Welch. Virtual Mobile Nodes for Mobile Ad hoc Networks. *Proceedings of the 18th International Conference on Distributed Computing (DISC)*, October, 2004.
http://theory.lcs.mit.edu/tds/papers/Gilbert/disc04.ps.

[5] Shlomi Dolev, Seth Gilbert, Limor Lahiani, Nancy Lynch, and Tina Nolte. Timed Virtual Stationary Automata for Mobile Networks. Technical Report MIT-LCS-TR-979a, MIT CSAIL, Cambridge, MA, August 2005.
http://theory.lcs.mit.edu/tds/papers/Nolte/TR979a.ps.

[6] James Aspnes, Dana Angluin, Zoë Diamadi, Michael J. Fischer, and René Peralta. Computation in networks of passively mobile finite-state sensors. *Proceedings of the Twenty-Third ACM Symposium on Principles of Distributed Computing*, July 2004, pp. 290-299. Accepted to *Distributed Computing (PODC 2004 special issue)*, September 2004. Last revised May 2005.
http://www.cs.yale.edu/homes/aspnes/podc04passive-dc-submission.pdf.