Seth L. Gilbert

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Education

Massachusetts Institute of Technology. *Cambridge, Massachusetts*
PhD 2007 in Computer Science
Advisor: Nancy A. Lynch, NEC Professor of Software Science and Engineering
Thesis: *Virtual Infrastructure for Wireless Ad Hoc Networks*

Massachusetts Institute of Technology. *Cambridge, Massachusetts*
MS 2003 in Computer Science
Advisor: Nancy A. Lynch, NEC Professor of Software Science and Engineering
Thesis: RAMBO *II: Rapidly Reconfigurable Atomic Memory for Dynamic Networks*

Yale University. *New Haven, Connecticut*
BS 1999 in Electrical Engineering (with Distinction) and in Mathematics

Employment

National University of Singapore (Dean's Chair Assistant Professor)
April 2013—present, *Singapore*

National University of Singapore (Assistant Professor)
Aug. 2010—April 2013, *Singapore*

Ecole Polytechnique Federale de Lausanne (Postdoctoral Researcher)
Feb. 2007–June 2010, *Lausanne, Switzerland*

Massachusetts Institute of Technology (Research Assistant, Teaching Assistant)
2001-2007, *Cambridge, MA*

Microsoft Corporation (Software Design Engineer)
1999-2001, *Redmond, WA*

Grants

Algorithms for Allocation and Reallocation in an Uncertain World, Primary Investigator
Duration: Jan. 2015–Dec. 2017 (756,094 SGD, AcRF Tier 2 grant)

Contention Resolution for Wireless Ad Hoc Networks of the Future, Primary Investigator
Duration: Jan. 2015–Dec. 2017 (121,000 SGD, FRC Tier 1 grant)

Reliable Information Delivery in Heterogeneous Sensor Networks, Co-Primary Investigator
In collaboration with: PI Chan Mun Choon (NUS) and co-PI Derek Leong (A*Star)
Duration: Aug. 2013–Aug. 2015 (924,136 SGD, A*Star SERC grant)

Fault-tolerant Communication Complexity in Wireless Networks, Co-Primary Investigator
In collaboration with: PI Haifeng Yu (NUS)
Duration: Apr. 2012–Sept. 2015 (577,000 SGD, AcRF Tier 2 grant)

MultiZOOM: Fast Algorithms for Multichannel Wireless Networks, Primary Investigator
Duration: Sept. 2010–August 2013 (150,000 SGD, FRC Tier 1 grant)

Students:

Doctoral students:

Lim Wei Quan, PhD expected: 2020.
Anuja Meetoo, PhD expected: 2018.
Suman Sourav, PhD expected: 2018.
Nimantha Baranasuriya, PhD 2016.
Liu Xiao (joint supervision with Haifeng Yu), PhD 2016.
Chaodong Zheng, PhD 2015, winner of the Deans Graduate Research Excellence award.

Undergraduate students:

Jonathan Irvin Gunawan, BS 2016.
Davin Xianjun Choo, BS 2016.
Poh Puay Kai, BS 2016.
Michael Yong, BS 2015.
Lim Wei Zhong, BS 2015.
Lim Wei Quan, BS 2015.
Chee Seng Hong Joe, BS 2014.
Wang Ruohan, BS 2012.
Xu Xiaojiang (joint supervision with Haifeng Yu), BS 2012.

Teaching

Optimization Algorithms, *Fall 2015*
Advanced undergraduate module on algorithms for optimization. Average student evaluation: 4.96/5.

Combinatorial and Graph Algorithms, *Fall 2013, Fall 2014, NUS*
Graduate module on algorithms for combinatorial optimization. Average student evaluation: 4.70/5.

Randomized Algorithms, *Fall 2012, NUS*
Proposed and developed a new module focusing on probability and randomization in computer science. Average student evaluation: 4.40/5.

Special Topics in Distributed Computing, *Fall 2011, NUS*
Developed a new module covering important topics in distributed computing, focusing on the application of algorithmic ideas to real-world systems. Average student evaluation: 5/5.

Data Structures and Algorithms (Accelerated), *Spring 2011, 2012, 2013, 2014, 2015 NUS*
Average student evaluation 2011–2016: 4.55/5.0, with 88 student “best teaching” nominations. Sample (anonymous) student feedback:

> It is very evident that Professor Seth has spent a lot of effort on every part of his module, which he developed essentially from scratch, the lectures and the tutorials and the discussion group materials and the problem sets, and even the tests and the coding quiz. The problem sets are very nicely set; he has provided a variety of problems that are neither too hard nor too easy and yet both interesting and applicable, and he also included many bonus parts which encourage students to try new things without discouraging those who are unable to do them. He also planned each tutorial well, so that it would be lively and engaging. [...] Besides all these, Professor Seth really enjoys teaching students and having discussion with them outside of class and even through email. He is very patient and it seems as though he is always glad when students learn, even when they are accidentally intruding into his lecture time! Also, he is always checking to see whether students have understood what he teaches,

and he is always keen on getting feedback directly from his students on his teaching, so that he can improve it even more the next time. I think every single student in his class will have really learnt a lot under his guidance and due to his encouragement.

Distributed Algorithms, co-Lecturer (with R. Guerraoui), *Fall 2008, EPFL*

Selected Topics in Distributed Computing, co-Lecturer (with R. Guerraoui), *Fall 2008, EPFL*

Awards

Young Researcher Award: NUS university-wide award for researchers under the age of 40, based on their impact and promise in research, 2014.

Faculty Teaching Excellence Award: For teaching in 2013/14 and 2014/15.

Annual Teaching Excellence Award: For teaching in 2013/14.

Dean's Chair: Appointed Dean's Chair Assistant Professor in April 2013.

QProbe: Locating the Bottleneck in Cellular Communication, Baranasuriya, Navda, Padmanabhan and Gilbert
Best short paper at Conference on emerging Networking EXperiments and Technologies (CoNEXT), 2015.

Smoothed Analysis for Dynamic Networks, Dinitz, Fineman, Gilbert and Newport
Invited to the special issue for the Symp. on Distributed Computing (DISC), 2015.

SybilCast: broadcast on the open airwaves, Gilbert and Zheng
Invited to the special issue for the Symp. on Parallelism in Algorithms and Architectures (SPAA), 2013.

Generating Fast Indulgent Algorithms, Alistarh, Gilbert, Guerraoui, and Travers
Best paper at the Intl. Conf. On Distributed Computing and Networking (ICDCN), 2011.

Of Choices, Failures and Asynchrony, Alistarh, Gilbert, Guerraoui, and Travers
Invited to the special issue for the Intl. Symp. on Algorithms and Computation (ISAAC), 2009.

GeoQuorums: Implementing Atomic Memory in Mobile Ad Hoc Networks, Dolev, Gilbert, Lynch, Shvartsman, and Welch
Invited to the special issue for the Intl. Conf. on Distributed Computing (DISC), 2003.

Publication Statistics

I have 76 refereed publications, including:

- 62 refereed conference publications, and
- 14 journal publications

Statistics about my publications, according to Google scholar:

- I have an h-index of 26.
- My most cited paper on Brewer's Conjecture and the CAP Theorem has over 1200 citations.
- I have 11 papers (and one technical report) with at least 50 citations.
- In total, I have more than 50 co-authors.
- Over the last ten years, I rank number 5 among all PODC authors (with 13 full papers).

Service

SPAA Program Committee Chair, Program committee chair for the 2016 Symposium on Parallelism in Algorithms and Architecture.

Editorial Board, Theory of Computing Systems (Springer), Member of the editorial board (2016—present).

Executive Committee of Sch. of Computing, Member—Asst. professors (Aug. 2011—present).

Security Program Task Force, Member (2015).

Curriculum Committee, Member (July 2014—present).

PhD Programme Revision Committee, Member (2013)

Workshop Chair, Intl. Symposium on Distributed Computing (DISC'13).

Publicity Chair, Intl. Symposium on Principles of Distributed Computing (PODC), 2010-2012.

Special Issue of Theory of Computing Systems, Guest Editor (with Michael Bender) Parallelism in Algorithms and Architectures (papers from SPAA 2009).

Workshop on Security and Reliability in Wireless Networks, Organizer (2009).

Program Committees

SPAA 2016	28th Symposium on Parallelism in Algorithms and Architectures (PC Chair)
PODC 2015	34th Symposium on Principles of Distributed Computing
MobiHoc 2015	Intl. Symposium on Mobile Ad Hoc Networking and Computing
PODC 2014	33rd Symposium on Principles of Distributed Computing
ICDCS 2014	35th Intl. Conference on Distributed Computing Systems
DISC 2014	27th Intl. Symposium on Distributed Computing
PODC 2013	32nd Symposium on Principles of Distributed Computing
DCOSS 2013	Intl. Conf. on Distributed Computing in Sensor Systems
DISC 2012	25th Intl. Symposium on Distributed Computing
ICDCS 2012	33rd Intl. Conference on Distributed Computing Systems
SSS 2012	14th Intl. Symp. on Stabilization, Safety, and Security of Distributed Systems
ICDCN 2012	13th Intl. Conf. on Distributed Computing and Networking
ICDCS 2011	32st Intl. Conference on Distributed Computing Systems
ICDCN 2011	12th Intl. Conf. on Distributed Computing and Networking
OPODIS 2011	15th Intl. Conference On Principles Of Distributed Systems
ICDCN 2010	12th Intl. Conf. on Distributed Computing and Networking
DIALM-POMC '10	6th Intl. Workshop on Foundations of Mobile Computing
SSS 2010	12th Intl. Symp. on Stabilization, Safety, and Security of Distributed Systems
LADIS 2010	4th Intl. Workshop on Large Scale Distributed Systems and Middleware
WASA 2010	Intl. Conference on Wireless Algorithms, Systems, and Applications
PODC 2010	Twenty-Ninth Symposium on Principles of Distributed Computing
ICDCS 2010	30th Intl. Conference on Distributed Computing Systems
SPAA 2009	21st Symposium on Parallelism in Algorithms and Architecture
DISC 2009	23rd Intl. Symposium on Distributed Computing
SRWN 2009	Workshop on Security and Reliability in Wireless Networks (Organizer)
ICDCS 2009	29th Intl. Conference on Distributed Computing Systems
SSS 2009	11th Intl. Symp. on Stabilization, Safety, and Security of Distributed Systems
AlgoSensors 2009	5th Intl. Workshop on Algorithmic Aspects of Wireless Sensor Networks

SIROCCO 2009	16th Intl. Colloq. on Structural Information and Communication
DISC 2008	22nd Intl. Symposium on Distributed Computing
SCW 2008	Spatial Computing Workshop at SASO
RDDS 2008	3rd Workshop on Reliability in Decentralized Distributed Systems
IPDPS 2008	22nd Intl. Parallel and Distributed Processing Symposium
PODC 2007	26th Symp. on Principles of Distributed Computing (Jr. Member)
HIPC 2005	12th Intl. Conference on High Performance Computing

Selected Invited Talks

Invited Talk, *July 2015*, 4th Workshop on Advances in Distributed Graph Algorithms
Bob the Builder vs. Fix-it-Felix: maintaining overlays in dynamic graphs

Invited Lecture, *July 2014*, Workshop on Randomized Algorithms for Distrib. Comp. and Networks
TBD: Three Backoff Dilemmas

Invited Lecture, *July 2013*, Workshop on Realistic Models for Algorithms in Wireless Networks
More is Better: Parallelism and Robustness in Multichannel Wireless Networks

Invited Lecture, *July 2012*, Network Science Workshop
Collecting Data in a Changing World: Hybrid Aggregation in Mobile Sensor Networks

Keynote Speaker, *June 2011*, 7th Intl. Workshop on Foundations of Mobile Computing
Faster and Better: the Promise of Dynamic Spectrum Access

Invited Lecture, *February 2009*, Winter School on Hot Topics in Distributed Computing
The Nine Circles of Torment: Algorithms for Robust Wireless Networks

Invited Talk (Lynch Symposium), *August 2008*, PODC, Canada
On Fault Tolerance in Wireless Networks

Distinguished Junior Lecturer Series, *April 2008*, Ben-Gurion University, Israel
Overcoming Disruption in Wireless Radio Networks

Invited Lecture, *February 2007*, Minema Winter School, Switzerland
Malicious Motes and Suspicious Sensors: Byzantine Interference in Wireless Networks

Selected Publications

- **How to Scale Exponential Backoff: Constant Throughput, Polylog Access Attempts, and Robustness** Michael Bender, Jeremy Fineman, Seth Gilbert and Maxwell Young. *In the Proceedings of the Symposium on Discrete Algorithms (SODA)*, 2016.

  Abstract: Randomized exponential backoff is a widely deployed technique for coordinating access to a shared resource. A good backoff protocol should, arguably, satisfy three natural properties: (i) it should provide constant throughput, wasting as little time as possible; (ii) it should require few failed access attempts, minimizing the amount of wasted effort; and (iii) it should be robust, continuing to work efficiently even if some of the access attempts fail for spurious reasons. Unfortunately, exponential backoff has some well-known limitations in two of these areas: it provides poor (sub-constant) throughput (in the worst case), and is not robust (to resource acquisition failures). The goal of this paper is to "fix" exponential backoff by making it scalable, particularly focusing on the case where processes arrive in an on-line, worst-case fashion. We present a relatively simple backoff protocol that has, at its heart, a version of exponential backoff. It guarantees expected constant throughput with dynamic process arrivals and requires only an expected polylogarithmic number of access attempts per process. Moreover, it is robust to periods where the shared resource is unavailable for a period of time.

Note: This recent paper was the culmination of a long attempt to understand the performance of backoff protocols, in particular to answer the question of why exponential backoff does not scale well (despite common misperceptions to the contrary) and to develop backoff protocols with good scalability properties.

- **Tight Bounds for Asynchronous Renaming** Dan Alistarh, James Aspnes, Keren Censor-Hillel, Seth Gilbert and Rachid Guerraoui. *Journal of the ACM*, 61(3):18, May 2014.

  Abstract: This article presents the first tight bounds on the time complexity of shared-memory renaming, a fundamental problem in distributed computing in which a set of processes need to pick distinct identifiers from a small namespace. We prove new lower bounds on both local step complexity and total work, yielding new lower bounds for many common concurrent data structures: deterministic fetch-and-increment counters, queues, and stacks, as well as for randomized approximate counter implementations. On the algorithmic side, we give a protocol that transforms any sorting network into a randomized strong adaptive renaming algorithm, which gives a tight adaptive renaming algorithm. This algorithm is the first to achieve sublinear time.

  Note: An early version of this paper appeared in the Symposium on Foundations of Computer Science (FOCS) 2011. The results in this paper answer several long-standing questions in the theory of parallel computing.

- **Cost-oblivious storage reallocation** Michael A. Bender, Martin Farach-Colton, Sándor P. Fekete, Jeremy T. Fineman, and Seth Gilbert. In the *Proceedings of the Symposium on Principles of Database Systems (PODS)*, 2014.

  Abstract: In this paper, we define the *storage reallocation problem*, where previously allocated blocks can be moved, or reallocated, but at some cost. The algorithms presented are *cost oblivious*, in that they work for a broad and reasonable class of cost functions, even when the algorithms do not know the cost function. The objective is to minimize the storage needed, while simultaneously minimizing the reallocation costs. This paper gives new asymptotically optimal algorithms for storage reallocation, in which the storage footprint is at most $(1+\epsilon)$ times optimal, and the reallocation cost is at most $(1/\epsilon)$ times the original allocation cost, which is also optimal. The algorithms are cost oblivious as long as the allocation/reallocation cost function is subadditive. We also explore some of the issues that arise when implementing this algorithm in a database context. We focus on two questions: how to integrate the allocator with an incremental checkpoint mechanism (which is critical for durability) and how to partially deamortize the algorithm, to limit the worst-case cost of any one operation.

  Note: This paper was motivated by disk allocation problems at a start-up database company, and focuses on developing interesting algorithmic solutions that may have practical applications in databases. It is also part of our larger project to understand the power of reallocation, i.e., to dynamically respond to changes while maintaining a (near) optimal solution.

- **Maximal independent sets in multichannel radio networks** Sebastian Daum, Mohsen Ghaffari, Seth Gilbert, Fabian Kuhn, Calvin C. Newport. In the *Proceedings of the 32nd Annual Symposium on Principles of Distributed Computing (PODC)*, 2013.

  Abstract: In this paper, we address the question of to what extent wireless protocols can benefit from dynamic spectrum access, i.e., whether multiple communication channels can improve performance. We study a multichannel generalization of the standard graph-based wireless model without collision detection, and assume the network topology satisfies polynomially bounded independence. Our core technical result is an algorithm that constructs a maximal independent set (MIS) in $O(\frac{\log^2 n}{F})+\tilde{O}(\log N)$ rounds in networks of size n with F channels, where the $\tilde{O}$-notation hides polynomial factors in $\log\log n$. Moreover, we use this MIS algorithm as a subroutine to build a constant-degree connected dominating set in the same asymptotic time. Leveraging this structure, we are able to solve global broadcast, leader election, and k-message multi-message broadcast with similar performance improvements. These results are all (nearly) tight, and hence resolve the question of how much improvement we can expect from dynamic spectrum access.

Note: This paper is the culmination of a longer project aiming to understand the benefits of dynamic spectrum access. While nominally focused on the problem of finding an MIS, in fact it answers the question of "how much performance can we gain via dynamic spectrum access" for a wide class of problems.

- **How to Allocate Tasks Asynchronously** Dan Alistarh, Michael A. Bender, Seth Gilbert and Rachid Guerraoui. In the *Proceedings of the Symposium on Foundations of Computer Science (FOCS)*, 2012.

  Abstract: Asynchronous task allocation is a fundamental problem in distributed computing in which p asynchronous processes must execute a set of m tasks. Also known as *write-all* or *do-all*, this problem been studied extensively, both independently and as a key building block for various distributed algorithms. In this paper, we break new ground on this classic problem: we introduce the *To-Do Tree* concurrent data structure, which improves on the best known randomized and deterministic upper bounds. In the presence of an adaptive adversary, the randomized To-Do Tree algorithm has $O(m + p \log p \log^2 m)$ work complexity. We then show that there exists a deterministic variant of the To-Do Tree algorithm with work complexity $O(m + p \log^5 m \log^2(\max(m, p)))$. For all values of m and p, our algorithms are within log factors of the $\Omega(m + p \log p)$ lower bound for this problem. The key technical ingredient in our results is a new approach for analyzing concurrent executions against a strong adaptive scheduler. This technique allows us to handle the complex dependencies between the processes' coin flips and their scheduling, and to tightly bound the work needed to perform subsets of the tasks.

  Note: This paper focuses on a very fundamental problem in parallel computing, one that has been studied extensively for several decades. We showed here that a relatively simple algorithmic approach leads to real improvements on this long-standing problem.

- **Making Evildoers Pay: Resource-Competitive Broadcast in Sensor Networks.** Seth Gilbert and Maxwell Young. In the *Proceedings of the 31st Annual Symposium on Principles of Distributed Computing (PODC)*, 2012.

  Abstract: Consider a wireless sensor network consisting of n correct devices and and $f \cdot n$ Byzantine devices where $f \geq 0$ is any constant. A trusted sender Alice wishes to deliver a message m to the correct devices. There is also an evil user Carol who controls the Byzantine devices and uses them to disrupt the communication channel. For a constant $k \geq 2$, the correct and Byzantine devices each possess a limited energy budget of $O(n^{1/k})$, Alice and Carol each possess a limited budget of $\tilde{O}(n^{1/k})$, and sending or listening in a slot incurs unit cost. This setup captures the inherent challenges of guaranteeing communication despite scarce resources and attacks on the network. Given this Alice versus Carol scenario, we ask: Is communication of m feasible and, if so, at what cost? We develop a protocol which, for an arbitrarily small constant $\epsilon > 0$, ensures that at least $(1 - \epsilon)n$ correct devices receive m with high probability. Furthermore, if Carol's devices expend T energy jamming the channel, then Alice and the correct devices each spend only $\tilde{O}(T^{1/(k+1)})$. In other words, delaying the transmission of m forces a jamming adversary to rapidly deplete its energy supply and, consequently, cease attacks on the network.

  Note: This paper was one of our first papers to leverage resource-competitive analysis. By contrasting the cost to attack a system with the cost to defend it, we get a better sense for when an algorithm is really robust.

- **Mutual Exclusion with $O(\log^2 \log n)$ Amortized Work.** Michael A. Bender and Seth Gilbert. In the *Proceedings of the Symposium on Foundations of Computer Science (FOCS)*, 2011.

  Abstract: This paper presents a new algorithm for mutual exclusion, a classical and long studied problem in distributed computing. Our new algorithm is exponentially faster than previously known algorithms, with an amortized cost of $O(\log^2 \log n)$ RMRs (with high probability) for each passage through the critical section. The algorithm operates in a standard asynchronous, local spinning, shared-memory model with an oblivious adversary. It guarantees that every process enters the critical section with high probability. The algorithm achieves its efficient performance by exploiting a connection between mutual exclusion and approximate counting.

Note: Mutual exclusion is one of the oldest problems in parallel computing, and for a long time, everyone had assumed that it was impossible to do much better than $\Theta(\log n)$ cost for each access to the critical section. And mutual exclusion was one of many such coordination problems where this was assumed to be the best you could do. This paper was the first to show that you can get significantly sub-logarithmic cost for mutual exclusion, and was followed over the next several years by several papers breaking the logarithmic bound for other coordination problems as well. Recent work (by other research groups) has improved on this result, reducing the cost to $O(1)$.

- **Brewer's conjecture and the feasibility of consistent, available, partition-tolerant web services** Seth Gilbert and Nancy A. Lynch *SIGACT News*, 33(2):51–59, 2002.

  Abstract: In a keynote address in 2000, Eric Brewer introduced the idea that there is a fundamental trade-off between consistency, availability, and partition tolerance. This trade-off, which has become known as the CAP Theorem, has been widely discussed ever since. In this paper, we develop a formal framework within which to analyze the CAP Theorem, and discuss some of its implications.

  Note: This paper has been widely cited, along with Brewer's original talk, as the foundational work on CAP. The CAP Theorem has both guided the development of distributed systems, while at the same time inspiring a revolt against its limitations in the form of the noSQL movement. We were recently invited to revisit the topic (*Perspectives on the CAP Theorem*, Seth Gilbert and Nancy A. Lynch *Computer*, to appear in the special issue on "CAP@Age 10"), situating the CAP Theorem within the broader context of distributed computing theory.

Full List of Publications

Journal Articles

[1] Seth Gilbert, Calvin Newport, and Chaodong Zheng. Who are you? secure identities in single hop ad hoc networks. *Distributed Computing*, 30(2):103–125, 2017.

[2] Michael A. Bender, Jeremy T. Fineman, Seth Gilbert, and Robert E. Tarjan. A new approach to incremental cycle detection and related problems. *ACM Trans. Algorithms*, 12(2), 2016.

[3] Seth Gilbert and Chaodong Zheng. Sybilcast: Broadcast on the open airwaves. *TOPC*, 2(3):16, 2015.

[4] Michael A. Bender, Jeremy T. Fineman, Mahnush Movahedi, Jared Saia, Varsha Dani, Seth Gilbert, Seth Pettie, and Maxwell Young. Resource-competitive algorithms. *SIGACT News*, 46(3):57–71, 2015.

[5] Michael A. Bender, Martin Farach-Colton, Sándor P. Fekete, Jeremy T. Fineman, and Seth Gilbert. Reallocation problems in scheduling. *Algorithmica*, 73(2):389–409, 2015.

[6] Keren Censor-Hillel, Seth Gilbert, Fabian Kuhn, Nancy A. Lynch, and Calvin C. Newport. Structuring unreliable radio networks. *Distributed Computing*, 27(1):1–19, 2014.

[7] Dan Alistarh, James Aspnes, Keren Censor-Hillel, Seth Gilbert, and Rachid Guerraoui. Tight bounds for asynchronous renaming. *J. ACM*, 61(3):18:1–18:51, 2014.

[8] Chryssis Georgiou, Seth Gilbert, Rachid Guerraoui, and Dariusz R. Kowalski. Asynchronous gossip. *Journal of the ACM*, 60(2), April 2013.

[9] Dan Alistarh, Seth Gilbert, Rachid Guerraoui, and Corentin Travers. Of choices, failures and asynchrony: The many faces of set agreement. *Algorithmica*, 62(1-2):595–629, February 2012.

[10] Seth Gilbert and Nancy A. Lynch. Perspectives on the cap theorem. *IEEE Computer*, 45(2):30–36, 2012.

[11] Chryssis Georgiou, Seth Gilbert, and Dariusz R. Kowalski. Meeting the deadline: On the complexity of fault-tolerant continuous gossip. *Distributed Computing*, 24(5):223–244, December 2011.

[12] Seth Gilbert, Nancy A. Lynch, and Alex A. Shvartsman. RAMBO: Rapidly reconfigurable atomic memory for dynamic networks. *Distributed Computing*, 23(4):225–272, December 2010.

[13] Gregory Chockler, Seth Gilbert, Vincent C. Gramoli, Peter M. Musial, and Alex A. Shvartsman. Reconfigurable distributed storage for dynamic networks. *Journal of Parallel and Distributed Computing*, 69(1):100–116, January 2009.

[14] Seth Gilbert, Rachid Guerraoui, and Calvin Newport. Of malicious motes and suspicious sensors: On the efficiency of malicious interference in wireless networks. *Theoretical Computer Science*, 410(6–7):546–569, February 2009.

[15] Seth Gilbert, Nancy Lynch, Sayan Mitra, and Tina Nolte. Self-stabilizing robot formations over unreliable networks. *Transactions on Autonomous and Adaptive Systems (TAAS), Special Issue on Self-Adaptive and Self-Organising Wireless Networking Systems*, 4(3), 2009.

[16] Gregory Chockler, Murat Demirbas, Seth Gilbert, Nancy A. Lynch, Calvin Newport, and Tina Nolte. Consensus and collision detectors in radio networks. *Distributed Computing*, 21(1):55–84, June 2008.

[17] Shlomi Dolev, Seth Gilbert, Nancy A. Lynch, Alex A. Shvartsman, and Jennifer Welch. GeoQuorums: Implementing atomic memory in mobile ad hoc networks. *Distributed Computing*, 18(2):125–155, November 2005.

[18] Seth Gilbert and Nancy A. Lynch. Brewer's conjecture and the feasibility of consistent, available, partition-tolerant web services. *SigAct News*, June 2002.

Conference Publications

[1] Michael A. Bender, Jeremy T. Fineman, Seth Gilbert, Tsvi Kopelowitz, and Pablo Montes. File maintenance: When in doubt, change the layout! In *Proceedings of the Symposium on Discrete Algorithms, (SODA)*, 2017.

[2] Michael A. Bender, Jeremy T. Fineman, Seth Gilbert, and Maxwell Young. How to scale exponential backoff: Constant throughput, polylog access attempts, and robustness. In *Proceedings of the Symposium on Discrete Algorithms (SODA)*, pages 636–654, January 2016.

[3] Xiangfa Guo, Mobashir Mohammad, Sudipta Saha, Mun Choon Chan, Seth Gilbert, and Derek Leong. Psync: Visible light-based time synchronization for internet of things. In *Proceedings of INFOCOM*, April 2016.

[4] Jeremy T. Fineman, Seth Gilbert, Fabian Kuhn, and Calvin Newport. Contention resolution on a fading channel. In *Proceeding of the Symposium on Principles of Distributed Computing (PODC)*, July 2016.

[5] Loi Luu, Viswesh Narayanan, Chaodong Zheng, Kunal Baweja, Seth Gilbert, and Prateek Saxena. A secure sharding protocol for open blockchains. In *Proceedings of the Conference on Computer and Communications Security (CCS)*, October 2016.

[6] Michael Dinitz, Jeremy T. Fineman, Seth Gilbert, and Calvin C. Newport. Smoothed analysis of dynamic networks. In *Proceedings of the Symposium on Distributed Computing (DISC)*, pages 513–527, October 2015.

[7] Seth Gilbert and Calvin C. Newport. The computational power of beeps. In *Proceedings of the Symposium on Distributed Computing (DISC)*, pages 31–46, October 2015.

[8] Michael A. Bender, Martin Farach-Colton, Sándor P. Fekete, Jeremy T. Fineman, and Seth Gilbert. Cost-oblivious reallocation for scheduling and planning. In *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pages 143–154, June 2015.

[9] Seth Gilbert, Fabian Kuhn, Calvin Newport, and Chaodong Zheng. Efficient communication in cognitive radio networks. In *Proceedings of the Symposium on Principles of Distributed Computing (PODC)*, pages 119–128, July 2015.

[10] Nimantha Baranasuriya, Vishnu Navda, Venkat Padmanabhan, and Seth Gilbert. Qprobe: Locating the bottleneck in cellular communication. In *Proceedings of the Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, December 2015.

[11] Seth Gilbert, Xiao Liu, and Haifeng Yu. On differentially private online collaborative recommendation systems. In *Proceedings of the International Conference on Information Security and Cryptology (ICISC)*, pages 210–226, November 2015.

[12] Dan Alistarh, James Aspnes, Michael Bender, Rati Gelashvili, and Seth Gilbert. Dynamic task allocation in asynchronous shared memory. In *Proceedings of the Symposium on Discrete Algorithms (SODA)*, January 2014.

[13] Seth Gilbert, Calvin Newport, and Chaodong Zheng. Who are you? secure identities in ad hoc networks. In *Proceeding of the International Symposium on Distributed Computing (DISC)*, October 2014.

[14] Michael A. Bender, Martin Farach-Colton, Sandor P. Fekete, Jeremy T. Fineman, and Seth Gilbert. Cost-oblivious storage reallocation. In *Proceeding of the Symposium on Principles of Database Systems (PODS)*, June 2014.

[15] Nimantha Thushan Baranasuriya, Seth Lewis Gilbert, Calvin C. Newport, and Jayanthi Rao. Aggregation in smartphone sensor networks. In *Proceedings of the Conference on Distributed Computing in Sensor Systems (DCOSS)*, pages 101–110, May 2014.

[16] Seth Gilbert and Wojciech M. Golab. Making sense of relativistic distributed systems. In *Proceedings of the Symposium on Distributed Computing (DISC)*, pages 361–375, October 2014.

[17] Seth Gilbert, Valerie King, Seth Pettie, Ely Porat, Jared Saia, and Maxwell Young. (near) optimal resource-competitive broadcast with jamming. In *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)*, pages 257–266, June 2014.

[18] Sebastian Daum, Mohsen Ghaffari, Seth Gilbert, Fabian Kuhn, and Calvin C. Newport. Maximal independent set in multichannel radio networks. In *Proceedings of the Symposium on Principles of Distributed Computing (PODC)*, July 2013.

[19] Sebastian Daum, Seth Gilbert, Fabian Kuhn, and Calvin C. Newport. Broadcast in the ad hoc SINR model. In *Proceeding of the International Conference on Distributed Computing (DISC)*, October 2013.

[20] Michael A. Bender, Martin Farach-Colton, Sandor P. Fekete, Jeremy T. Fineman, and Seth Gilbert. Reallocation problems in scheduling. In *Proceeding of the Symposium on Parallelism in Algorithms and Architectures (SPAA)*, July 2013.

[21] Seth Gilbert and Chaodong Zheng. Sybilcast: broadcast on the open airwaves. In *Proceeding of the Symposium on Parallelism in Algorithms and Architectures (SPAA)*, July 2013.

[22] Seth Gilbert and Maxwell Young. Making evildoers pay: resource-competitive broadcast in sensor networks. In *Proceedings of the Symposium on Principles of Distributed Computing (PODC)*, July 2012.

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[24] Sebastian Daum, Seth Gilbert, Fabian Kuhn, and Calvin C. Newport. Leader election in shared spectrum radio networks. In *Proceedings of the Symposium on Principles of Distributed Computing (PODC)*, July 2012.

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