

Salim El Rouayheb

CONTACT INFORMATION 94 Brett Rd Phone: +1 (848) 445-9154
CoRE 717 Email:
Piscataway, Township, NJ 08854 salim.elrouayheb@rutgers.edu
USA <http://eceweb1.rutgers.edu/csi>

WORK & EXPERIENCE **Rutgers University** September 2017 - Present
Assistant Professor
Illinois Institute of Technology
Assistant Professor August 2013 - August 2017
Princeton University
Associate Research Scholar January 2012 - July 2013
University of California, Berkeley
Postdoctoral Fellow September 2009 - December 2011

EDUCATION **Texas A&M University**, College Station
Ph.D., Electrical and Computer Engineering, August 2009
American University of Beirut
M.S., Electrical and Computer Engineering, August 2004
Lebanese University
Diploma, Electrical Engineering, August 2002

PUBLICATIONS **Journal Papers**

Published

1. R. Bitar and **S. El Rouayheb**, “Staircase Codes for Secret Sharing with Optimal Communication and Read Overheads”, *IEEE Transactions on Information Theory*, early access, July 2017.
2. N. Milosavljevic, S. Pawar, **S. El Rouayheb**, M. Gastpar and K. Ramchandran, “Efficient Algorithms for the Data Exchange Problem”, *IEEE Transactions on Information Theory*, Vol. 62, No. 4, February 2016.
3. **S. El Rouayheb**, S. Goparaju, H. M. Kiah and O. Milenkovic, “Synchronization and Deduplication in Coded Distributed Storage Networks”, *IEEE/ACM Transactions on Networking*, No. 99, December 2015.
4. M. Effros, **S. El Rouayheb** and M. Langberg, “An Equivalence between Network Coding and Index Coding”, *IEEE Transactions on Information Theory*, Vol. 61, No. 5, May 2015.
5. T. Ernvall, **S. El Rouayheb**, C. Hollanti and H.V. Poor, “Capacity and Security of Heterogeneous Distributed Storage Systems”, *IEEE journal on Selected Areas in Communications*, Vol. 31, No.12, December 2013.
6. **S. El Rouayheb**, E. Soljanin and A. Sprintson, “Secure Network Coding for Wiretap Networks of Type II”, *IEEE Transactions on Information Theory*, Vol. 56, No. 9, March 2012.
7. S. Pawar, **S. El Rouayheb** and K. Ramchandran, “Securing Dynamic Distributed Storage Systems against Eavesdropping and Adversarial Attacks”, *Transactions on Information Theory*, Vol. 57, No. 9, September 2011.

8. **S. El Rouayheb**, A. Sprintson and C. N. Georghiades, “Robust Network Codes for Unicast Connections: A Case Study”, *IEEE/ACM Transactions on Networking*, Vol. 19, No. 3, June 2011.
9. **S. El Rouayheb**, A. Sprintson and C. N. Georghiades, “On the Index Coding Problem and its Relation to Network Coding and Matroid Theory”, *IEEE Transactions on Information Theory*, Vol. 56, No. 7, July 2010.

Book Chapters

10. **S. El Rouayheb**, S. Goparaju and K. Ramchandran, “Security in Distributed Storage Systems”, book chapter in *Information Theoretic Security and Privacy*, Cambridge University Press, 2017.
11. **S. El Rouayheb**, and C. N. Georghiades, “Graph-Theoretic Methods in Coding Theory”, book chapter in *Classical, Semi-classical and Quantum Noise*, Springer, 1st Edition, October 2012.

Preprints

12. S. Kadhe, B. Garcia, A. Heidarzadeh, **S. El Rouayheb** and A. Sprintson, “Private Information Retrieval with Side Information” , arXiv.1709.00112 [cs.IT].
13. S. Kas Hanna and **S. El Rouayheb**, “Correcting a Constant Number of Deletions Using MDS Codes”.
14. S. Kadhe, **S. El Rouayheb**, I. Duursma and A. Sprintson, “Rank-Metric Codes with Local Recoverability”.
15. R. Tajeddine and **S. El Rouayheb**, “Private Information Retrieval from MDS Coded Data in Distributed Storage Systems”, arXiv.1602.01458 [cs.IT].

Conferences

2017

1. S. Kas Hanna and **S. El Rouayheb**, ”Correcting Bursty and Localized Deletions Using Guess & Check Codes”, *55th Annual Allerton Conference on Communication, Control, and Computing*, October 2017.
2. S. Kadhe, B. Garcia, A. Heidarzadeh, **S. El Rouayheb** and A. Sprintson,”Private Information Retrieval with Side Information: the Single Server Case”, *55th Annual Allerton Conference on Communication, Control, and Computing*, October 2017.
3. S. Kas Hanna and **S. El Rouayheb**, “Guess & Check Codes for Deletions and Synchronization”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.
4. R. Tajeddine, O. Gnilke, D. Karpuk, C. Hollanti and **S. El Rouayheb**, “Private Information Retrieval Schemes for Coded Data with Arbitrary Collusion Patterns”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.
5. R. Tajeddine, and **S. El Rouayheb**, “Robust Private Information Retrieval on Coded Data”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.
6. R. Bitar, P. Parag and **S. El Rouayheb**, “Minimizing Latency for Secure Distributed Computing”, *IEEE International Symposium on Information Theory (ISIT)*, 2017.

2016

7. S. Kadhe, **S. El Rouayheb**, I. Duursma and A. Sprintson, “Rank-Metric Codes with Local Recoverability”, *54th Annual Allerton Conference on Communication, Control, and Computing*, September, 2016.

8. R. Tajeddine and **S. El Rouayheb**, “Private Information Retrieval from MDS Coded Data”, *IEEE International Symposium on Information Theory (ISIT)*, Barcelona, July 2016.
9. R. Bitar and **S. El Rouayheb**, “Staircase Codes for Secret Sharing”, *IEEE International Symposium on Information Theory (ISIT)*, Barcelona, July 2016.

2015

10. S. Goparaju, **S. El Rouayheb** and R. Calderbank, “Can linear minimum storage regenerating codes be universally secure?”, *49th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, California, November 2015.
11. X. Huang and **S. El Rouayheb**, “Index Coding and Network Coding via Rank Minimization”, *IEEE Information Theory Workshop (ITW)*, Korea, October 2015.
12. **S. El Rouayheb**, S. Goparaju, H. M. Kiah and O. Milenkovic, “Synchronizing Edits in Distributed Storage Networks”, *IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, June 2015.
13. R. Bitar and **S. El Rouayheb**, “Securing data against Limited-Knowledge Adversaries in Distributed Storage Systems”, *IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, June 2015.

2014

14. S. Goparaju, **S. El Rouayheb** and R. Calderbank, “New Codes and Inner Bounds for Exact Repair in Distributed Storage Systems”, *IEEE International Symposium on Information Theory (ISIT)*, Honolulu, Hawaii, July 2014.

2013

15. S. Goparaju, **S. El Rouayheb**, R. Calderbank and H. Vincent Poor, “Data Secrecy in Distributed Storage Systems under Exact Repair”, *IEEE International Symposium on Network Coding (Netcod)*, Calgary, Canada, July 2013.
16. M. Effros, **S. El Rouayheb**, M. Langberg, “An Equivalence between Network Coding and Index Coding”, *IEEE International Symposium on Information Theory (ISIT)*, Istanbul, Turkey, July 2013.
17. T. Ernvall, **S. El Rouayheb**, C. Hollanti and H. Vincent Poor, “Capacity and Security of Heterogeneous Distributed Storage Systems”, *IEEE International Symposium on Information Theory (ISIT)*, Istanbul, Turkey, July 2013.

2012

18. N. Milosavljevic, S. Pawar, **S. El Rouayheb**, M. Gastpar and K. Ramchandran, “Data Exchange Problem with Helpers”, *IEEE International Symposium on Information Theory (ISIT)*, Boston, Massachusetts, July 2012.

2011

19. S. Pawar, **S. El Rouayheb**, H. Zhang, K. Lee and K. Ramchandran, “Codes for a Distributed Caching Based Video-On-Demand System”, *Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, November 2011.
20. S. Pawar, N. Noorshams, **S. El Rouayheb** and K. Ramchandran, “DRESS Codes for the Storage Cloud: Simple Randomized Constructions”, *IEEE International Symposium on Information Theory (ISIT)*, St Petersburg, Russia, August 2011.
21. S. Pawar, **S. El Rouayheb** and K. Ramchandran, “Securing Dynamic Distributed Storage Systems from Malicious Nodes”, *IEEE International Symposium on Information Theory (ISIT)*, St Petersburg, Russia, August 2011.

22. N. Milosavljevic, S. Pawar, **S. El Rouayheb**, M. Gastpar and K. Ramchandran, “An Optimal Divide-and-Conquer Solution to the Linear Data Exchange Problem”, *IEEE International Symposium on Information Theory (ISIT)*, St Petersburg, Russia, August 2011.

2010

23. **S. El Rouayheb** and K. Ramchandran, “Fractional Repetition Codes for Repair in Distributed Storage Systems”, *48th Annual Allerton Conference on Communication, Control and Computation*, Monticello, September 2010.
24. S. Pawar, **S. El Rouayheb** and K. Ramchandran, “On Secure Distributed Data Storage Under Repair Dynamics”, *IEEE International Symposium on Information Theory (ISIT)*, Austin, Texas, July 2010.
25. **S. El Rouayheb**, V. Prabhakaran and K. Ramchandran, “Secure Distributed Storage of Decentralized Source Data, Can Interaction Help?”, *IEEE International Symposium on Information Theory (ISIT)*, Austin, Texas, July 2010.
26. **S. El Rouayheb**, P. Sadeghi and A. Sprintson, “A Randomized Algorithm and Performance Bounds for Coded Cooperative Data Exchange”, *IEEE International Symposium on Information Theory (ISIT)*, Austin, Texas, July 2010.
27. **S. El Rouayheb**, A. Sprintson and P. Sadeghi, “On Coding for Cooperative Data Exchange”, *IEEE Information Theory Workshop (ITW)*, Cairo, Egypt, January 2010.

2009

28. **S. El Rouayheb**, A. Sprintson and C. Georghiades, “A New Construction Method for Networks from Matroids”, *IEEE International Symposium on Information Theory (ISIT)*, Seoul, Korea, July 2009.
29. **S. El Rouayheb**, A. Sprintson and C. Georghiades, “Efficient Network Coding Algorithm for Dynamic Networks”, *IEEE International Workshop on Wireless Network Coding*, Rome, Italy, June 2009.

2008

30. **S. El Rouayheb**, A. Sprintson and C. Georghiades, “On the Relation Between the Index Coding and the Network Coding Problems”, *IEEE International Symposium on Information Theory (ISIT)*, Toronto, Canada, July 2008.

2007

31. **S. El Rouayheb**, M. A. R. Chaudhry and A. Sprintson, “On the Minimum Number of Transmissions in Single-Hop Wireless Coding Networks”, *IEEE Information Theory Workshop*, Lake Tahoe, California, September 2007.
32. **S. El Rouayheb**, C. N. Georghiades, E. Soljanin and A. Sprintson, “Bounds on Codes Based on Graph Theory”, *IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 2007.
33. **S. El Rouayheb** and E. Soljanin, “On Wiretap Networks II”, *IEEE International Symposium on Information Theory (ISIT)*, Nice, France, June 2007.
34. A. Sprintson, **S. El Rouayheb** and C. Georghiades, “Robust Network Coding for Bidirected Networks”, *USCD Workshop on Information Theory and its Applications*, San Diego, California, February 2007 (Invited paper)

2006

35. **S. El Rouayheb**, C. N. Georghiades and A. Sprintson, “Network Coding in Minimal Multicast Networks”, *IEEE Information Theory Workshop (ITW)*, Punta del Este, Uruguay, March 2006.

36. **S. El Rouayheb**, A. Sprintson and C. Georghiades, “Simple Network Codes for Instantaneous Recovery from Edge Failures in Unicast Connections”, *USCD Workshop on Information Theory and its Applications*, San Diego, California, February 2006 (Invited paper).

RESEARCH
GROUP

Postdoctoral Scholars

- Dr. Ramezan Paravi joint with Prof. Olgica Milenkovic, started Fall 2016.

PhD Students

- Rawad Bitar, started Fall 2014.
- Razan Tajeddine, started Fall 2014.
- Serge Kas Hanna, started Fall 2015.

Master’s Student

- Peiwen Tian, started Fall 2015.

Alumni

- Xiao Huang, Master Thesis, 2014.
Current Position: PhD student at Texas A&M University.

Visitors

- Dr. Parimal Parag, Indian Institute of Science, Fall 2016.
- Dr. Ragnar Freij-Hollanti, Aalto university, Fall 2015.
- Prof. Camilla Hollanti, Aalto University, Fall 2015.
- Prof. Marcelo Firer, Unicamp, Spring 2014.
- Dr. Sreechakra Goparaju, University of California, San Diego, Fall 2013.

INVITED TALKS

- ◇ “Private Information Retrieval from Coded Data”, *54th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, September 2016.
- ◇ “Private Information Retrieval from MDS Coded Data”, *Private Information Retrieval, Distributed Storage, Network Coding Workshop*, London, July 2016.
- ◇ “Secret Sharing in Distributed Storage Systems”, *Nexus of Information and Computation Theories*, Paris, February 2016.
- ◇ “Index Coding Algorithms for Constructing Network Codes”, *DIMACS Workshop on Network Coding: The Next 15 Years*, New Jersey, December 2015.
- ◇ “How to Store a Secret”, *DIMACS Workshop on Coding Theoretic Methods for Network Security*, New Jersey, April 2015.
- ◇ “Index Coding via Convex Optimization”, *Banff Workshop on Information Theory and Combinatorics*, Banff, March 2015.
- ◇ “Synchronization and Deduplication of Coded Data in Distributed Storage Systems”, *Information Theory and Applications Workshop*, San Diego, February 2015.
- ◇ “Index Coding, Network Coding and Related Combinatorial Problems”, *UIUC Comm Seminar*, Urbana-Champaign, March 2015.

Organized Sessions

- “Index Coding, Caching and Distributed Storage” session at [IEEE Communication Theory Workshop \(CTW 2015\)](#), May 2015.
- “Bounds and Duality in Network Coding” session at [52nd Annual Allerton Conference on Communication, Control, and Computing](#), October 2014.

Reviewer

IEEE Transactions on Information Theory, IEEE Journal On Selected Areas In Communications, Journal of Communications and Networks, IEEE Communications Letters, IEEE Globecom, International Symposium on Information Theory (ISIT), IEEE Network Coding Workshop (NetCod), IEEE Information Theory Workshop (ITW).

Information Theory Student Committee Co-Chair

January 2010 - 2011

MEMBERSHIPS [IEEE](#), [Information Theory Society](#)