

## Michael Langberg: list of publications

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**Remark:** Each paper appears in a single entry below (journal and conference versions of the same paper appear in the same entry).

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### Journal papers

1. U. Feige and M. Langberg.  
Approximation algorithms for maximization problems arising in graph partitioning.  
*Journal of Algorithms* 41(2), 174-211, 2001.
2. U. Feige, M. Karpinski and M. Langberg.  
A Note on Approximating MAX-BISECTION on Regular Graphs.  
*Information Processing Letters* 79, 181-188, 2001.
3. U. Feige, M. Karpinski and M. Langberg.  
Improved approximation of Max-Cut on graphs of bounded degree.  
*Journal of Algorithm* 43(2), 201-219, 2002.
4. U. Feige, M. Langberg and G. Schechtman.  
Graphs with tiny vector chromatic numbers and huge chromatic numbers.  
*SIAM Journal on Computing* 33(6), 1338-1368, 2004.  
Also appeared in proceedings of the 43rd Annual IEEE Symposium on Foundations of Computer Science (FOCS), 283-292, 2002.
5. U. Feige and M. Langberg.  
The  $RPR^2$  rounding technique for semidefinite programs.  
*Journal of Algorithms* 60(1), 1-23, 2006.  
Also appeared in proceedings of 28th International Colloquium on Automata, Languages and Programming (ICALP), 213-224, 2001.
6. M. Langberg, A. Sprintson and J. Bruck.  
The encoding complexity of network coding.  
*IEEE Transactions on Information Theory* 52(6), 2386-2397, 2006 (a joint special issue with *IEEE/ACM Transactions on Networking on Networking and Information Theory*).  
Also appeared in proceedings of IEEE International Symposium on Information Theory (ISIT) 2005, 1987-1991.
7. A. Avidor and M. Langberg.  
The Multi-Multiway Cut Problem.  
*Theoretical Computer Science* 377(1-3), 35-42, 2007.  
Also appeared in proceedings of 9th Scandinavian Workshop on Algorithm Theory (SWAT), 273-284, 2004.
8. M. Langberg.  
Oblivious channels and their capacity.  
*IEEE Transactions on Information Theory*, 54(1), 424-429, 2008.  
A previous version under the name "Oblivious channels" appeared in IEEE International Symposium on Information Theory (ISIT) 2006, 2739-2743.

9. S. Jaggi, M. Langberg, S. Katti, T. Ho, D. Katabi, M. Médard and M. Effros.  
Error-correction for Byzantine Adversaries in Networks: A Distributed Network Coding Approach.  
*IEEE Transactions on Information Theory (special issue on information-theoretic security)* 54(6), 2008, 2596 - 2603.  
Also appeared in proceedings of 26th Annual IEEE Conference on Computer Communications (INFOCOM), 616-624, 2007; and in 3rd Workshop on Network Coding, Theory, and Applications (NetCod) 2007 (invited talk).
10. M. Langberg, A. Sprintson and J. Bruck.  
Optimal Universal Schedules for Discrete Broadcast.  
*IEEE Transactions on Information Theory* 54(9): 4365-4372, 2008.  
Also in proceedings of IEEE International Symposium on Information Theory (ISIT) 2004, p. 111.
11. J. Gao, M. Langberg and L. Schulman.  
Analysis of Incomplete Data and an Intrinsic-Dimension Helly Theorem.  
*Discrete & Computational Geometry* 40(4): 537-560, 2008.  
Also in proceedings of 17th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 464-473, 2006.
12. M. Langberg, A. Sprintson and J. Bruck.  
Network Coding: A Computational Perspective.  
*IEEE Transactions on Information Theory* 55(1): 147-157, 2009.  
Also in 40th Annual Conference on Information Sciences and Systems (CISS) 2006 (invited paper).
13. M. Langberg and L. Schulman.  
Contraction and expansion of convex sets.  
*Discrete & Computational Geometry* 42(4): 594-614, 2009.  
Also in 19th Canadian Conference on Computational Geometry (CCCG), 25-28, 2007.
14. G. Kortsarz, M. Langberg and Z. Nutov.  
Approximating Maximum Subgraphs Without Short Cycles.  
*SIAM J. on Discrete Math* 24(1), 255-269, 2010.  
Also in proceedings of 11th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2008, 118-131.
15. S. Chechik, M. Langberg, D. Peleg and L. Roditty.  
Fault-Tolerant Spanners for General Graphs.  
*SIAM Journal on Computing (SICOMP)* 39(7), 3403-3423, 2010.  
Also in proceedings of 41st ACM Symposium on Theory of Computing (STOC), 435-444, 2009.
16. J. Gao, M. Langberg and L. Schulman.  
Clustering lines: classification of incomplete data.  
*ACM Transactions on Algorithms*, 7(1): 8, 2010.
17. M. Langberg and A. Sprintson.  
On the Hardness of Approximating the Network Coding Capacity.  
*IEEE Transactions on Information Theory* 57(2): 1008-1014, 2011.  
Also in proceedings of IEEE International Symposium on Information Theory (ISIT) 2008, 315-319.
18. E. En Gad, M. Langberg, M. Schwartz, and J. Bruck.  
Constant-Weight Gray Codes for Local Rank Modulation.  
*IEEE Transactions on Information Theory* 57(11): 7431-7442, 2011.

19. S. Chechik, M. Langberg, D. Peleg and L. Roditty.  
*f*-Sensitivity Distance Oracles and Routing Schemes.  
*Algorithmica* 63(4): 861-882, 2012 (special issue on ESA 2010).  
 Also in proceedings of 18th Annual European Symposium on Algorithms (ESA) 2010, 84-96.
20. B. K. Dey, S. Jaggi and M. Langberg.  
 Codes against online adversaries, Part I: Large alphabets.  
 To appear in *IEEE Transactions on Information Theory*, 2012.  
 Also in proceedings of the Forty-Seventh Annual Allerton Conference on Communication, Control, and Computing, 2009, 1169-1176.
21. B. K. Dey, S. Jaggi, M. Langberg, and A. Sarwate.  
 Upper Bounds on the Capacity of Binary Channels with Causal Adversaries.  
 To appear in *IEEE Transactions on Information Theory*, 2012.  
 This journal paper merges two conference papers:
  - M. Langberg, S. Jaggi and B. K. Dey.  
 Binary Causal-Adversary Channels.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2009, 2723 - 2727.*
  - B. K. Dey, S. Jaggi, M. Langberg, and A. Sarwate.  
 Improved Upper Bounds on the Capacity of Binary Channels with Causal Adversaries.  
*To appear in IEEE International Symposium on Information Theory (ISIT) 2012.*
22. A. Jiang, M. Langberg, M. Schwartz and J. Bruck.  
 Trajectory Codes for Flash Memory.  
 To appear in *IEEE Transactions on Information Theory*, 2012.  
 Also in proceedings of *IEEE International Symposium on Information Theory (ISIT) 2009, 1219 - 1223.*
23. A. Ramamoorthy and M. Langberg.  
 Communicating the sum of sources over a network.  
 To appear in *IEEE Journal on Selected Areas of Communications: Special Issue on In-Network Computation: Exploring the Fundamental Limits*, 2012.  
 This journal submission merges two conference papers:
  - M. Langberg and A. Ramamoorthy.  
 Communicating the sum of sources in a 3-sources/3-terminals network.  
*In proc. of IEEE International Symposium on Information Theory (ISIT) 2009, 2121-2125.*
  - A. Ramamoorthy and M. Langberg.  
 Communicating the sum of sources in a 3-sources/3-terminals network; revisited.  
*In proc. of IEEE International Symposium on Information Theory (ISIT) 2010, 1853-1857.*

#### Submitted for journal publication

24. H. Yao, D. Silva, S. Jaggi and M. Langberg.  
 Network Codes Resilient to Jamming and Eavesdropping.  
*Submitted for journal publication.*  
 This journal submission merges two conference papers, the first has a flaw fixed in the second:
  - S. Jaggi and M. Langberg.  
 Resilient network codes in the presence of eavesdropping Byzantine adversaries.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2007, 541-545.*
  - H. Yao, D. Silva, S. Jaggi, M. Langberg.  
 Network Codes Resilient to Jamming and Eavesdropping.  
*In proceedings of IEEE International Symposium on Network Coding (NetCod) 2010.*

25. E. En Gad, M. Langberg, M. Schwartz, and J. Bruck.  
Generalized Gray Codes for Local Rank Modulation.  
*Submitted for journal publication.*  
*In proceedings of IEEE International Symposium on Information Theory (ISIT), 2011, 839-843.*
26. M. Langberg and D. Vilenchik.  
Edge distribution in generalized graph products.  
*Submitted for journal publication.*

### Conferences papers

27. U. Feige, M. Langberg and K. Nissim.  
On the hardness of approximating NP witnesses.  
*In proceedings of 3rd International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 120-131, 2000.*
28. M. Langberg, A. Pnueli and Y. Rodeh.  
The ROBDD size of simple CNF formulas.  
*In proceedings of 12th Advanced Research Working Conference on Correct Hardware Design and Verification Methods (CHARME), 363-377, 2003.*
29. M. Langberg.  
Testing the independence number of hypergraphs.  
*In proceedings of 8th International Workshop on Randomization and Computation (RANDOM), 405-416, 2004.*
30. M. Langberg.  
Private codes or Succinct random codes that are (almost) perfect.  
*In proceedings of 45th Annual IEEE Symposium on Foundations of Computer Science (FOCS), 325-334, 2004.*
31. M. Langberg, A. Sprintson and J. Bruck.  
Staleness vs. Waiting Time in Universal Discrete Broadcast.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2005, 2124-2128.*  
*A previous version under the name "Optimal Schedules for Asynchronous Transmission of Discrete Packets" appeared as ETR062 at <http://www.paradise.caltech.edu/ETR.html>.*
32. S. Jaggi, M. Langberg, T. Ho and M. Effros.  
Correction of Adversarial Errors in Networks.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2005, 1455-1459.*
33. M. Langberg, Y. Rabani and C. Swamy.  
Approximation Algorithms for Graph Homomorphism Problems.  
*In proceedings of 9th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 176-187, 2006.*
34. S. Shengvi, S. Jaggi, B. K. Dey and M. Langberg.  
"Real" Slepian-Wolf coding using Random (1,-1) Matrices.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2008.*
35. L. Nutman and M. Langberg.  
Adversarial Models and Resilient Schemes for Network Coding.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2008, 171-175.*

36. M. Langberg and M. Médard.  
On the Multiple Unicast Network Coding Conjecture.  
*In proceedings of the Forty-Seventh Annual Allerton Conference on Communication, Control, and Computing, 2009, 222 - 227.*
37. A. Jiang, M. Langberg, R. Mateescu and J. Bruck.  
Data Movement in Flash Memories.  
*In proceedings of the Forty-Seventh Annual Allerton Conference on Communication, Control, and Computing, 2009, 1031 - 1038.*
38. M. Langberg and L. Schulmann.  
Universal  $\epsilon$ -approximators for integrals.  
*In proceedings of ACM-SIAM Symposium on Discrete Algorithms (SODA) 2010, 598-607.*
39. R. Bar-Yanai, M. Langberg, D. Peleg and L. Roditty.  
Realtime Classification for Encrypted traffic.  
*In proceedings of 9th International Symposium on Experimental Algorithms (SEA) 2010, 373-385.*
40. A. Jiang, M. Langberg, R. Mateescu and J. Bruck.  
Data movement and aggregation in flash memories.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2010, 1918 - 1922.*
41. B. K. Dey, S. Jaggi, M. Langberg, and A. Sarwate  
Codes against Delayed Adversaries.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2010, 285 - 289.*
42. R. A. Costa, M. Langberg, and J. Barros  
One-Shot Capacity of Discrete Channels.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2010, 211 - 215.*
43. D. Feldman and M. Langberg.  
A Unified Framework for Approximating and Clustering Data.  
*In 43rd ACM Symposium on Theory of Computing (STOC), 2011, 569-578.*
44. I. Haviv and M. Langberg.  
Beating the Gilbert-Varshamov Bound for Online Channels.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT), 2011, 1297-1301.*
45. M. A. R. Chaudhry, Z. Asad, A. Sprintson, and M. Langberg.  
On the Complementary Index Coding Problem.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT), 2011, 306-310.*
46. Y. Berliner and M. Langberg.  
Index coding with outerplanar side information.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT), 2011, 869-873.*
47. M. A. R. Chaudhry, Z. Asad, A. Sprintson, and M. Langberg.  
Finding Sparse Solutions for the Index Coding Problem.  
*In proceedings of IEEE GLOBECOM - Wireless Communications Symposium, 2011, 1-5.*
48. M. Langberg and M. Effros.  
Network Coding: Is zero error always possible?  
*In proceedings of Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing, 2011, 1478-1485.*

49. Y. Liron and M. Langberg.  
A characterization of the number of subsequences obtained via the deletion channel.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2012, 508-512.*
50. M. Gonen and M. Langberg.  
The coded cooperative data exchange problem for general topologies.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2012, 2616-2620.*
51. I. Haviv and M. Langberg.  
On Linear Index Coding for Random Graphs.  
*In proceedings of IEEE International Symposium on Information Theory (ISIT) 2012, 2241-2245.*
52. M. Langberg and M. Effros.  
Source coding for dependent sources.  
*In proceedings of IEEE Information Theory Workshop (ITW), 2012.*
53. I. Haviv and M. Langberg.  
 $H$ -wise independent distributions.  
*To appear in proceedings of Innovations in Theoretical Computer Science (ITCS), 2013.*
54. P. H. Che, M. Chen, T. Ho, S. Jaggi, and M. Langberg.  
Routing for Security in Networks with Adversarial Nodes.  
*To appear in proceedings of IEEE International Symposium on Network Coding (NetCod), 2013.*
55. W. Huang, T. Ho, M. Langberg, and J. Kliewer.  
On secure network coding with uniform wiretap sets.  
*To appear in proceedings of IEEE International Symposium on Network Coding (NetCod), 2013.*
56. M. F. Wong, M. Langberg, and M. Effros.  
On a Capacity Equivalence between Network and Index Coding and the Edge Removal Problem.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*
57. E. Yaakobi, M. Schwartz, M. Langberg, and J. Bruck.  
Sequence Reconstruction for Grassmann Graphs and Permutations.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*
58. M. Effros, S. El Rouayheb, and M. Langberg.  
An Equivalence between Network Coding and Index Coding.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*
59. K. Shanmugam, A. G. Dimakis, and M. Langberg.  
Local Graph Coloring and Index Coding.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*
60. E. Yaakobi, M. Langberg, and J. Bruck.  
Information-Theoretic Study of Voting Systems.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*
61. A. Jiang, Y. Li, E. En Gad, M. Langberg, J. Bruck.  
Joint Rewriting and Error Correction in Write-Once Memories.  
*To appear in proceedings of IEEE International Symposium on Information Theory (ISIT), 2013.*

### Short papers and posters

1. J. Bruck, M. Langberg and M. Schwartz.  
Broadcast and Label Assignment in Directed Anonymous Networks.  
*In proceedings of 26th Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (PODC), 382-383, 2007 as a brief 2 page announcement.*
  2. M. A. R. Chaudhry, Z.Asad, A. Sprintson and M. Langberg.  
An Efcient Algorithm for Complimentary Index Coding Problem (poster).  
*Poster at IEEE International Symposium on Information Theory (ISIT) 2010.*
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### Book Chapters and Tutorials

1. M. Langberg.  
Graph Coloring, (1994, 1998; Karger, Motwani, Sudan).  
*Chapter in Encyclopedia of Algorithms, Springer publications (2008).*
  2. S. Jaggi and M. Langberg.  
Reliable and Secure Communication using Network Coding.  
*Chapter to appear in: Network Coding: Fundamentals and Applications, M. Medard (Editor), A. Sprintson (Editor), Academic Press (2011).*
  3. M. Langberg and A. Sprintson.  
Recent Results on the Algorithmic Complexity of Network Coding.  
*Tutorial appearing in proceedings of 2009 Workshop on Network Coding, Theory, and Applications (NetCod 2009).*
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### Patents

1. J. Bruck, M. Langberg and A. Sprintson.  
Data Transmission System and Method.  
*U.S. Patent Number: US 7,680,147 B2. Filing date: August 31 2005. Issued: March 16 2010.*
  2. A. Jiang, J. Bruck, E. En Gad, Michael Langberg, Y. Li.  
Joint Rewriting and Error Correction in Write-Once Memories.  
*Under review, 2013.*
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### Theses

1. M. Langberg.  
Approximation Algorithms for Maximization Problems arising in Graph Partitioning.  
M.Sc. thesis, Department of Computer Science and Applied Mathematics.  
Weizmann Institute of Science, Rehovot, Israel. December 1998.
2. M. Langberg.  
Coping with NP-hardness: Approximation algorithms based on semidefinite programming.  
Ph.D. thesis, Department of Computer Science and Applied Mathematics.  
Weizmann Institute of Science, Rehovot, Israel. April 2003.

## Manuscripts

1. C. Dwork, M. Langberg, M. Naor, K. Nissim and O. Reingold.  
Succinct proofs for NP and Spooky Interactions.  
*Manuscript.*
2. D. Goldstein and M. Langberg.  
The Dense- $k$ -Subgraph problem.  
*Manuscript.*