

Erasure Coding for Distributed Storage Wiki

Papers

This page contains a list of the papers in the area of Distributed Storage, organized in sections by subject. Within each section, papers are listed in reverse chronological order.

Storage System Implementations

Opening the Chrysalis: On the Real Repair Performance of MSR Codes

L. Pamies-Juarez, F. Blagojevic, R. Mateescu, C. Gyuot, E. En Gad, and Z. Bandic, To appear in USENIX FAST 2016. Paper [http://web.archive.org/web/20161220120259/https://www.usenix.org/sites/default/files/fast16_full_proceedings_interior.pdf#page=89]

Coded Caching Clusters with Device-to-Device Communications

J. Paakkonen, A. Barreal, C. Hollanti, and O. Tirkkonen, Paper [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1605.09002/>]

Device-to-Device Data Storage with Regenerating Codes

J. Paakkonen, C. Hollanti, and O. Tirkkonen, Proc. 8th International Workshop on Multiple Access Communications (MACOM), September 2015. Paper [<http://web.archive.org/web/20161220120259/https://arxiv.org/abs/1411.1608/>]

A Hitchhiker's Guide to Fast and Efficient Data Reconstruction in Erasure-coded Data Centers

K. V. Rashmi, Nihar B. Shah, Dikang Gu, Hairong Kuang, Dhruva Borthakur, and Kannan Ramchandran ACM SIGCOMM, Aug 2014. Paper [http://web.archive.org/web/20161220120259/http://eecs.berkeley.edu/~rashmikv/papers/Hitchhiker_SIGCOMM14.pdf] Slides [http://web.archive.org/web/20161220120259/http://eecs.berkeley.edu/~rashmikv/papers/Hitchhiker_slides_sigcomm2014.pdf]

Device-to-Device Data Storage for Mobile Cellular Systems

J. Paakkonen, C. Hollanti, and O. Tirkkonen, Proc. IEEE Global Communications Conference (GLOBECOM), December 2013. Paper [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/6825065/>]

NCCloud: A Network-Coding-Based Storage System in a Cloud-of-Clouds

Henry C. H. Chen, Yuchong Hu, Patrick P. C. Lee, and Yang Tang
Accepted for publication in IEEE Transactions on Computers (TC) - Special Issue: Cloud of Clouds. (An earlier version appeared in FAST 2012)
pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/tc13ncloud.pdf>] software [<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/software/nccloud>] IEEE Xplore [<http://web.archive.org/web/20161220120259/http://dx.doi.org/10.1109/TC.2013.167>]

A Solution to the Network Challenges of Data Recovery in Erasure-coded Distributed Storage Systems: A Study on the Facebook Warehouse Cluster

K. V. Rashmi, Nihar B. Shah, Dikang Gu, Hairong Kuang, Dhruva Borthakur, Kannan Ramchandran
USENIX HotStorage 2013
pdf [<http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~rashmikv/papers/HotStorage13.pdf>] slides [http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~rashmikv/papers/HotStorage13_slides.pdf]

XORing Elephants: Novel Erasure Codes for Big Data

Maheswaran Sathiamoorthy, Megasthenis Asteris, Dimitris Papailiopoulos, Alexandros G. Dimakis, Ramkumar Vadali, Scott Chen, Dhruva Borthakur
VLDB 2013

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.3791>] Xorbas Project Webpage
<http://web.archive.org/web/20161220120259/http://smahesh.com/HadoopUSC/>] (source code available for download)

CORE: Augmenting Regenerating-Coding-Based Recovery for Single and Concurrent Failures in Distributed Storage Systems

Runhui Li, Jian Lin, Patrick P. C. Lee

29th IEEE Conference on Massive Data Storage (MSST 2013) (Short paper), Long Beach, CA, May 2013

pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/msst13.pdf>] pptx

[<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/msst13.pptx>] arXiv

[<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1302.3344>] software

[<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/software/core>]

Erasure coding in Windows Azure Storage

Cheng Huang, Huseyin Simitci, Yikang Xu, Aaron Ogus, Brad Calder, Parikshit Gopalan, Jin Li, Sergey Yekhanin

USENIX ATX 2012 [http://web.archive.org/web/20161220120259/http://research.microsoft.com/en-us/um/people/yekhanin/Papers/UsenixATX_2012.pdf]

NCCloud: Applying Network Coding for the Storage Repair in a Cloud-of-Clouds

Y. Hu, H.C.H. Chen, P.P.C. Lee and Y. Tang

FAST 2012.

pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/fast12.pdf>] pptx

[<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/fast12.pptx>] software

[<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/software/nccloud/>]

Queueing Theory and Distributed Storage

When Queueing Meets Coding: Optimal-Latency Data Retrieving Scheme in Storage Clouds

Shengbo Chen, Yin Sun, Ulas C. Kozat, Longbo Huang, Prasun Sinha, Guanfeng Liang, Xin Liu, Ness B. Shroff

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1404.6687>]

The MDS Queue

Nihar B. Shah, Kangwook Lee, Kannan Ramchandran

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1211.5405>]

Toward Sustainable Networking: Storage Area Networks with Network Coding

Ulric J. Ferner, Muriel Medard, Emina Soljanin

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1205.3797>]

Coding for Fast Content Download

Gauri Joshi, Yanpei Liu, Emina Soljanin

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.3012>]

Codes Can Reduce Queueing Delay in Data Centers

Longbo Huang, Sameer Pawar, Hao Zhang, Kannan Ramchandran

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1202.1359>]

Regenerating Codes

Here we list papers that study the problem of minimizing repair communication (aka. Repair Bandwidth).

* General introduction to the [Repair Problem](#).

[Video tutorial on Regenerating Codes \[http://web.archive.org/web/20161220120259/https://www.youtube.com/watch?v=obXTLCTBGuU\]](http://web.archive.org/web/20161220120259/https://www.youtube.com/watch?v=obXTLCTBGuU)

A Connection Between Locally Repairable Codes and Exact Regenerating Codes

T. Ernvall, T. Westerbäck, R. Freij-Hollanti and Camilla Hollanti,

Proceedings of IEEE International Symposium on Information Theory (ISIT), 2016.

IEEEExplore [\[http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7541379/\]](http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7541379/) arXiv

[\[http://web.archive.org/web/20161220120259/https://arxiv.org/abs/1603.05846\]](http://web.archive.org/web/20161220120259/https://arxiv.org/abs/1603.05846)

The storage-repair-bandwidth trade-off of exact repair linear regenerating codes for the case $d = k = n - 1$.

Prakash, N., and M. Nikhil Krishnan. Information Theory (ISIT), 2015 IEEE International Symposium on. IEEE, 2015. arXiv

[\[http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1501.03983\]](http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1501.03983)

Exact repair for distributed storage systems: Partial characterization via new bounds

Mohajer, Soheil, and Ravi Tandon. Information Theory and Applications Workshop (ITA), 2015. IEEE, 2015.

http://ita.ucsd.edu/workshop/15/files/paper/paper_1908.pdf

[\[http://web.archive.org/web/20161220120259/http://ita.ucsd.edu/workshop/15/files/paper/paper_1908.pdf\]](http://web.archive.org/web/20161220120259/http://ita.ucsd.edu/workshop/15/files/paper/paper_1908.pdf)

Characterizing the Rate Region of the (4,3,3) Exact-Repair Regenerating Codes

Chao Tian

Accepted, IEEE Journal on Selected Areas in Communications: Special Issue on Communication Methodologies for the Next-Generation Storage Systems.

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1312.0914\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1312.0914)

Capacity and security of heterogeneous distributed storage systems

Toni Ernvall, Salim El Rouayheb, Camilla Hollanti, and Vincent Poor

IEEE Journal on Selected Areas in Communications: Special Issue on Networking Challenges in Cloud Computing Systems and Applications, Nov. 2013.

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1211.0415\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1211.0415)

Exact-regenerating codes between MBR and MSR points

Toni Ernvall

IEEE Information Theory Workshop, Seville, Spain, Sept. 2013.

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1304.5357\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1304.5357)

A Piggybacking Design Framework for Read-and Download-efficient Distributed Storage Codes

K. V. Rashmi, Nihar B. Shah, Kannan Ramchandran

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.5872.pdf\]](http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.5872.pdf)

On Minimizing Data-read and Download for Storage-Node Recovery

Nihar B. Shah

pdf [\[http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~nihar/publications/mbr_no_rbt.pdf\]](http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~nihar/publications/mbr_no_rbt.pdf)

Repairing Multiple Failures in the Suh-Ramchandran Regenerating Codes

J. Chen, Kenneth W. Shum

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1302.1256\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1302.1256)

Exact-Repair Regenerating Codes Via Layered Erasure Correction and Block Designs

C Tian, V Aggarwal, VA Vaishampayan

arXiv [\[http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.4670.pdf\]](http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.4670.pdf)

On Weak Dress Codes for Cloud Storage

MK Gupta, A Agrawal, D Yadav

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.3681.pdf>]**High-Rate Regenerating Codes Through Layering**

B Sasidharan, PV Kumar

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1301.6157.pdf>]**Repair for Distributed Storage Systems with Erasure Channels**

Majid Gerami, and Ming Xiao

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.7054>]**Decentralized Minimum-Cost Repair for Distributed Storage Systems**

Majid Gerami, Ming Xiao, Carlo Fischione, and Mikael Skoglund

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.7265>]**Update-Efficient Error-Correcting Regenerating Codes**

Yunghsiang S. Han, Hong-Ta Pai, Rong Zheng, and Pramod K. Varshney

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.4620>]**Update-Efficient Regenerating Codes with Minimum Per-Node Storage**

Yunghsiang S. Han, Hong-Ta Pai, Rong Zheng, and Pramod K. Varshney

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.2497>]**Optimal Locally Repairable and Secure Codes for Distributed Storage Systems**

Ankit Singh Rawat, O. Ozan Koyluoglu, Natalia Silberstein, Sriram Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.6954>]**Secure Cooperative Regenerating Codes for Distributed Storage Systems**

O. Ozan Koyluoglu, Ankit Singh Rawat, Sriram Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.3664>]**Analysis and Construction of Functional Regenerating Codes with Uncoded Repair for Distributed Storage Systems**

Yuchong Hu, Patrick P. C. Lee, Kenneth W. Shum

Proceedings of IEEE INFOCOM 2013

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1208.2787>]**Quasi-cyclic Regenerating Codes**

Bernat Gastón, Jaume Pujol, Mercè Villanueva

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1209.3977>]**Exact Cooperative Regenerating Codes with Minimum-Repair-Bandwidth for Distributed Storage**

Anyu Wang, Zhifang Zhang

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1207.0879>]**Regenerating Codes: A System Perspective**

Steve Jiekak, Anne-Marie Kermarrec, Nicolas Le Scouarnec, Gilles Straub, Alexandre Van Kempen

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1204.5028.pdf>]

CROSS-MBCR: Exact Minimum Bandwidth Coordinated Regenerating Codes

Steve Jiekak and Nicolas Le Scouarnec

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1207.0854.pdf>]**Locally Repairable Codes**

D. S. Papailiopoulos and A. G. Dimakis

ISIT 2012.

pdf [http://web.archive.org/web/20161220120259/http://www-bcf.usc.edu/~dimakis/isit12_LRC.pdf]**An Empirical Study of the Repair Performance of Novel Coding Schemes for Networked Distributed Storage Systems**

Lluis Pamies-Juarez, Frédérique Oggier, Anwitaman Datta

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1206.2187.pdf>]**Redundantly Grouped Cross-object Coding for Repairable Storage**

Anwitaman Datta, Frederique Oggier

ACM SIGOPS Asia-Pacific Workshop on Systems (APSys 2012)

Regenerating codes: what matters in practice?

Steve Jiekak, Anne-Marie Kermarrec, Nicolas Le Scouarnec, Gilles Straub, and Alexandre Van Kempe

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1204.5028>]**On Partial Downloading for Wireless Distributed Storage Networks**

Chen Gong and Xiaodong Wang

IEEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6062413>]**Functional-repair-by-transfer regenerating codes**

Kenneth W. Shum and Yuchong Hu

ISIT 2012.

pdf [<http://web.archive.org/web/20161220120259/http://home.ie.cuhk.edu.hk/~wkshum/papers/FRBT.pdf>]**Regenerating Codes for Errors and Erasures in Distributed Storage**

K. V. Rashmi, Nihar B. Shah, Kannan Ramchandran, and P. Vijay Kumar

ISIT 2012

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1202.1050.pdf>]**Adversarial Error Resilience in Distributed Storage Using MRD Codes and MDS Array Codes**

Natalia Silberstein, Ankit Singh Rawat, and Sriram Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1202.0800.pdf>]**NCCloud: Applying Network Coding for the Storage Repair in a Cloud-of-Clouds**

Y. Hu, H.C.H. Chen, P.P.C. Lee and Y. Tang

FAST 2012.

pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pclee/www/pubs/fast12.pdf>]**Exact Scalar Minimum Storage Coordinated Regenerating Codes**

Nicolas Le Scouarnec

ISIT 2012.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1202.0457.pdf>]

Zigzag Codes: MDS Array Codes with Optimal Rebuilding

Itzhak Tamo, Zhiying Wang, Jehoshua Bruck

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1112.0371>]**Polynomial Length MDS Codes for Optimal Repair in Distributed Storage**

Viveck R. Cadambe, Cheng Huang, Jin Li, Sanjeev Mehrotra

pdf [<http://web.archive.org/web/20161220120259/http://www.mit.edu/~viveck/resources/Research/CompdCodes.pdf>]**Cooperative Regenerating Codes**

Kenneth W. Shum and Yuchong Hu

Submitted to Trans. IT.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1207.6762>]**Quasicyclic MDS Codes for Distributed Storage with Efficient Exact Repair**

A. Thangaraj and C. Sankar

ITW 2011, Brazil

Preprint [<http://web.archive.org/web/20161220120259/http://www.ee.iitm.ac.in/~andrew/papers/CyclicRepairCodes.pdf>]**Study of the Feasibility of a Distributed Storage System based on a Minimum Bandwidth Exact Regenerating Code**

Eric Arnoult

pdf

Hybrid Approaches for Distributed Storage Systems

J. Araujo, F. Giroire and J. Monteiro

Download [<http://web.archive.org/web/20161220120259/http://www.springerlink.com/content/073x51581920135m/>]**Exact Regenerating Codes for Byzantine Fault Tolerance in Distributed Storage**

Y. S. Han, R. Zheng and W. H. Mow

INFOCOM 2012

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1108.3883>] [More](#)**Selective Regenerating Codes**

A. Kiani and S. Akhlaghi

IEEE Communication Letters, vol. 15, issue 8, pp.854 - 856, August 2011

IEEEExplore download [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5934689&tag=1] [More](#)**Minimization of Storage Cost in Distributed Storage Systems with Repair Consideration**

Quan Yu, Kenneth W. Shum, and Chi Wan Sung

IEEE GLOBECOM, Houston 2011.

download [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1107.5645>] [More](#)**Simple Regenerating Codes: Network Coding for Cloud Storage**

D. S. Papailiopoulos, J. Luo, A. G. Dimakis, C. Huang, and J. Li

submitted, arXiv, Aug 2011.

download [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1109.0264>] [More](#)**Repair Optimal Erasure Codes through Hadamard Designs**

D. S. Papailiopoulos, A. G. Dimakis, and V. R. Cadambe

Allerton, 2011.

pdf [http://web.archive.org/web/20161220120259/http://www.scf.usc.edu/~papailio/Hadamard_mds_allerton.pdf] More

NCFS: On the Practicality and Extensibility of a Network-Coding-Based Distributed File System

Y. Hu, C. Yu, Y. Li, P. P. C. Lee, and J. C. S. Lui

NetCod 2011, Beijing, China

pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/netcod11.pdf>] Slides

[<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/netcod11.ppt>] Source Code

[<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/software/ncfs>]

Homomorphic Self-repairing Codes for Agile Maintenance of Distributed Storage Systems

Frederique Oggier and Anwitaman Datta,

arXiv

Note: This is a substantially extended version of an earlier work published in Infocom 2011

Project homepage [<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/>]

Repairing Multiple Failures with Coordinated and Adaptive Regenerating Codes

Anne-Marie Kermarrec, Nicolas Le Scouarnec and Gilles Straub

The 2011 International Symposium on Network Coding (NetCod 2011).

An extended version is available on arXiv:1102.0204 [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1102.0204>] and the conference version is available on the author's page [<http://web.archive.org/web/20161220120259/http://www.thlab.net/~lescouarnec/>]. It supersedes a research report entitled *Beyond Regenerating Codes* and published in September 2010.

More

Distributed Storage Codes through Hadamard Designs

D. S. Papailiopoulos and A. G. Dimakis

ISIT, August 2011.

pdf [http://web.archive.org/web/20161220120259/http://www.scf.usc.edu/~papailio/hadamard_ISIT2010_short_camera_ready.pdf] More

Exact Minimum-Repair-Bandwidth Cooperative Regenerating Codes for Distributed Storage Systems

Kenneth W. Shum and Yuchong Hu

Presented in IEEE Int. Symp. on Inform. Theory (ISIT) 2011.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1102.1609>] More

Self-Repairing Codes for Distributed Storage - A Projective Geometric Construction

Frederique Oggier and Anwitaman Datta,

In IEEE Information Theory Workshop (ITW) 2011.

arXiv More Project homepage [<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/>]

A Network Coding Based Framework for Construction of Systematic Regenerating Codes for Distributed Storage

Swanand Kadhe, M. Girish Chandra, and Balaji Janakiram,

Status: Submitted to ACM Transactions on Storage, Apr 2011.

Preprint.pdf More

Optimal-Cost Repair in Multi-hop Distributed Storage Systems

Majid Gerami, Ming Xiao, Mikael Skoglund

Proceedings of IEEE International Symposium on information Theory (ISIT), 2011

pdf [http://web.archive.org/web/20161220120259/http://www.ee.kth.se/~mingx/ISIT2011_GXS.pdf] More

Quasi-cyclic Minimum Storage Regenerating Codes for Distributed Data Compression

B. Gastón, J. Pujol and M. Villanueva

Proceedings of the Data Compression Conference (DCC), 2011

[IEEE Xplore \[http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5749461\]](http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5749461) [More](#)

Cooperative Regenerating Codes for Distributed Storage Systems

Kenneth W. Shum

Presented in IEEE International Conf. on Comm. (ICC) 2011.

[arXiv \[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1101.5257\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1101.5257) [More](#)

Enabling Node Repair in Any Erasure Code for Distributed Storage

K. V. Rashmi, Nihar B. Shah and P. Vijay Kumar

IEEE International Symposium on Information Theory (ISIT) 2011.

[arXiv \[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1101.0133\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1101.0133) [More](#)

ExR: A Scheme for Exact Regeneration of a Failed Node in a Distributed Storage System

Balaji Janakiram, Swanand Kadhe, and M. Girish Chandra,

Proceedings of Annual International Conference on Advances in Distributed and Parallel Computing (ADPC), Nov 2010.

[pdf](#) [More](#)

Distributed Storage Codes with Repair-by-Transfer and Non-achievability of Interior Points on the Storage-Bandwidth Tradeoff

Nihar B. Shah, K. V. Rashmi, P. Vijay Kumar, and Kannan Ramchandran

Nov, 2010.

[arXiv \[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1011.2361\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1011.2361) [More](#)

Distributed Storage Codes Meet Multiple-Access Wiretap Channels

D. S. Papailiopoulos and A. G. Dimakis

Allerton, September 2010.

[pdf \[http://web.archive.org/web/20161220120259/http://www.scf.usc.edu/~papailio/papers/ALLER10_0322_FI.pdf\]](http://web.archive.org/web/20161220120259/http://www.scf.usc.edu/~papailio/papers/ALLER10_0322_FI.pdf) [More](#)

Fractional Repetition Codes for Repair in Distributed Storage Systems

S. El Rouayheb and K. Ramchandran

Allerton, September 2010.

[pdf \[http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~salim/FractionalRepetition_Allerton10.pdf\]](http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~salim/FractionalRepetition_Allerton10.pdf) [More](#)

Beyond Regenerating Codes

A.-M. Kermarrec, N. Le Scouarnec, and Straub,

INRIA Research Report, September 2010.

[pdf \[http://web.archive.org/web/20161220120259/http://hal.archives-ouvertes.fr/docs/00/51/66/47/PDF/RR-7375.pdf\]](http://web.archive.org/web/20161220120259/http://hal.archives-ouvertes.fr/docs/00/51/66/47/PDF/RR-7375.pdf)

[More](#) Superseded by *Repairing Multiple Failures with Coordinated and Adaptive Regenerating Codes*.

A Flexible Class of Regenerating Codes for Distributed Storage

N. B. Shah, K. V. Rashmi, P. Vijay Kumar, and K. Ramchandran,

in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

[IEEE Xplore \[http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05513353\]](http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05513353) [More](#)

Self-repairing Homomorphic Codes for Distributed Storage Systems

F. Oggier, A. Datta

in Proc. 2011 IEEE International Conference on Computer Communications (INFOCOM)

Arxiv, July 2010.

Note: A substantially extended version of this work is now available

[arXiv \[http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1008.0064\]](http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1008.0064) [More](#)

Explicit and Optimal Exact-Regenerating Codes for the Minimum-Bandwidth Point in Distributed Storage

K. V. Rashmi, N. B. Shah, P. V. Kumar, and K. Ramchandran,
in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05513367>] More

Cooperative Recovery of Distributed Storage Systems from Multiple Losses with Network Coding

Yuchong Hu, Yinlong Xu, Xiaozhao Wang, Cheng Zhan and Pei Li,
IEEE J. on Selected Areas in Comm., vol. 28, no. 2, pp.268–276, Feb, 2010

IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5402494] More

Double Circulant Minimum Storage Regenerating Codes

Bernat Gastón, and Jaume Pujol,

Status: Deprecated. New version called “Quasi-cyclic Minimum Storage Regenerating Codes for Distributed Data Compression”

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1007.2401>] More

Distributed Data Storage with Minimum Storage Regenerating Codes - Exact and Functional Repair are Asymptotically Equally Efficient

V. R. Cadambe, S. A. Jafar, H. Maleki,
in Proc. 2010 Wireless Network Coding (WINC) Workshop, April 10, 2010.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1004.4299>] More

A Fundamental Trade-off Between The Download Cost And Repair Bandwidth In Distributed Storage Systems

S. Akhlaghi, A. Kiani, and M. R. Ghanavati,
in Proc. 2010 IEEE International Symposium on Network Coding (NetCod), Jun. 2010.

[More](#)

A Practical Network Coding Approach for Peer-to-Peer Distributed Storage

M. Martaló, M. Picone, R. Bussandri, and Michele Amoretti,
in Proc. 2010 IEEE International Symposium on Network Coding (NetCod), Jun. 2010.

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5487686>] More

Optimal Exact-Regenerating Codes for Distributed Storage at the MSR and MBR Points via a Product-Matrix Construction

K. V. Rashmi, Nihar B. Shah, and P. Vijay Kumar

Results: Explicit codes for the MBR point for all feasible values of $[n, k, d]$. Explicit codes for the MSR point for all $[n, k, d \geq 2k-2]$.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1005.4178>] Poster, ISIT Recent Results, Austin, Jun. 2010

[http://web.archive.org/web/20161220120259/https://www.ece.iisc.ernet.in/~vijay/storage/papers/ISIT_PM_poster.pdf]

IEEE Transactions on Information Theory, vol. 57, no. 8, August 2011.

[More](#)

Interference Alignment in Regenerating Codes for Distributed Storage: Necessity and Code Constructions

Nihar B. Shah, K. V. Rashmi, P. Vijay Kumar, and Kannan Ramchandran

Journal version of the results which appeared in part in ITW 2010, Cairo and in part in Allerton Conference 2009.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1005.1634>]

IEEE Transactions on Information Theory, April 2012.

[More](#)

Tree-structured Data Regeneration in Distributed Storage Systems with Regenerating Codes

Jun Li, Shuang Yang, Xin Wang, Baochun Li.

IEEE INFOCOM 2010, San Diego, California, March 15-19, 2010.

[More](#)

Exact Regeneration Codes for Distributed Storage Repair Using Interference Alignment

C. Suh and K. Ramchandran

in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1001.0107>]

IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5513263] [More](#)

Explicit Codes Minimizing Repair Bandwidth for Distributed Storage

Nihar B. Shah, K.V. Rashmi, P. Vijay Kumar, Kannan Ramchandran

Explicit codes for the MSR point of the storage-repair bandwidth tradeoff curve. Also contains additional results for the MSR point.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/0908.2984>] [More](#)

Explicit Construction of Optimal Exact Regenerating Codes for Distributed Storage

K. V. Rashmi, Nihar B. Shah, P. Vijay Kumar, Kannan Ramchandran

Status: In Proceedings of Allerton Conference on Communication, Control and Computing, September 2009

Results: Explicit exact regenerating codes for the MBR point for $d=n-1$, and approximately exact regenerating codes for the MSR point for $d=k+1$.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/0906.4913>] [More](#)

Interference Alignment as a Tool in Network Coding as Applied to Distributed Storage

Nihar B. Shah, K. V. Rashmi, P. Vijay Kumar and Kannan Ramchandran

Status: Presented at National Conference on Communications, Chennai, India, January 2010.

pdf [http://web.archive.org/web/20161220120259/http://www.ece.iisc.ernet.in/~nihar/publications/ncc2010_IAinNC.pdf] [More](#)

Explicit Codes Uniformly Reducing Repair Bandwidth in Distributed Storage

K. V. Rashmi, Nihar B. Shah, P. Vijay Kumar and Kannan Ramchandran.

Explicit codes reducing repair bandwidth to approximately 50% of the total file size for all values of system parameters.

Status: Presented at National Conference on Communications, Chennai, India, January 2010.

pdf [http://web.archive.org/web/20161220120259/http://www.ece.iisc.ernet.in/~nihar/publications/ncc2010_unifBW.pdf] [More](#)

A Construction of Systematic MDS Codes with Minimum Repair Bandwidth

Yunnan Wu

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/0910.2486>] [More](#)

A practical study of regenerating codes for peer-to-peer backup systems.

A Duminuco, E Biersack

appeared in the Proceedings of the 2009 ICDCS.

download [<http://web.archive.org/web/20161220120259/http://www.eurecom.fr/util/pubdownload.en.htm?id=2718>]

Reducing repair traffic for erasure coding-based storage via interference alignment

Y Wu, AG Dimakis - IEEE Intl Symp. on Information Theory (ISIT) 2009.

pdf [http://web.archive.org/web/20161220120259/http://www-rcf.usc.edu/~dimakis/isit09_WD.pdf] [More](#)

Existence and construction of capacity-achieving network codes for distributed storage

Y. Wu,

IEEE Int'l Symp. on Information Theory (ISIT), Seoul, Korea, June 2009.

[More](#)

Searching for Minimum Storage Regenerating Codes

Daniel Cullina, Alexandros G. Dimakis, Tracey Ho

IEEE Int'l Symp. on Information Theory (ISIT), Seoul, Korea, June 2009.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/0910.2245>] [More](#)

Network Coding for Distributed Storage Systems

Alexandros G. Dimakis, P. Brighten Godfrey, Y. Wu, Martin J. Wainwright, Kannan Ramchandran

Arxiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/0803.0632>].

IEEE Transactions on Information Theory, vol. 58, no. 9, Sep 2010. Preliminary version appeared in Infocom 2007.

More

An Unified Form of Exact-MSR Codes via Product-Matrix Framework

Sian-Jheng Lin, Wei-Ho Chung

pdf [<http://web.archive.org/web/20161220120259/http://www.citi.sinica.edu.tw/papers/sjlin/3477-F.pdf>].

2013 IEEE 24th Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (IEEE PIMRC'2013), London, UK, 2013.

More

Novel Repair-by-Transfer Codes and Systematic Exact-MBR Codes with Lower Complexities and Smaller Field Sizes

Sian-Jheng Lin, Wei-Ho Chung

Arxiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1309.3752>].

More

Repairing Known Codes

Here we list papers on repairing known families of codes (e.g. Reed-Solomon, Array Codes, EvenOdd etc)

Repairing Reed-Solomon Codes

Venkatesan Guruswami and Mary Wootters. STOC 2016. arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1509.04764>]

Single disk failure recovery for X-Code-based parallel storage systems

Xu, Silei, Runhui Li, Patrick PC Lee, Yunfeng Zhu, Liping Xiang, Yinlong Xu, and John Lui, IEEE Transactions on Computers 63.4 (2014): 995-1007. Paper [<http://web.archive.org/web/20161220120259/http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.643.7992&rep=rep1&type=pdf>]

A Repair Framework for Scalar MDS codes

K Shanmugam, DS Papailiopoulos, AG Dimakis, G Caire Selected Areas in Communications, IEEE Journal (JSAC) 2014. arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1312.2135>]

Rebuilding for array codes in distributed storage

Zhiying Wang, Alexandros G. Dimakis, and Jehoshua Bruck, IEEE Globecom, Miami, Florida, December, 2010. Paper [<http://web.archive.org/web/20161220120259/http://faculty.sites.uci.edu/zhiying/files/2015/09/Rebuilding-for-array-codes-in-distributed-storage.pdf>]

Security in Distributed Storage

Here we include papers on codes for security and privacy in distributed storage systems.

One Extra Bit of Download Ensures Perfectly Private Information Retrieval

Nihar B. Shah, K. V. Rashmi and Kannan Ramchandran IEEE International Symposium on Information Theory (ISIT), 2014. Paper [http://web.archive.org/web/20161220120259/http://eecs.berkeley.edu/~rashmikv/papers/PIR_in_erasure_codes_ISIT2014.pdf]

On Block Security of Regenerating Codes at the MBR Point for Distributed Storage Systems

Son Hoang Dau, Wentu Song, and Chau Yuen

Accepted for publication in IEEE International Symposium on Information Theory (ISIT'14).

full version on arxiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1309.2712v3.pdf>]

Towards Optimal Secure Distributed Storage Systems with Exact Repair

Ravi Tandon, S. Amuru, T. Charles Clancy and R. M. Buehrer

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1310.0054>]**Enabling Data Integrity Protection in Regenerating-Coding-Based Cloud Storage: Theory and Implementation**

Henry C. H. Chen and Patrick P. C. Lee

Accepted for publication in IEEE Transactions on Parallel and Distributed Systems (TPDS) - Special Issue: Trust, Security, and Privacy. (An earlier version appeared in SRDS 2012)

main pdf [http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/tpds13fmsrdip_main.pdf] supp pdf[http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/tpds13fmsrdip_supp.pdf] software[<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/software/fmsrdip>] IEEE Xplore[<http://web.archive.org/web/20161220120259/http://dx.doi.org/10.1109/TPDS.2013.164>]**Secure Regenerating Codes Based on Rashmi-Shah-Kumar MBR Codes**

M Kurihara, H Kuwakado

online [http://web.archive.org/web/20161220120259/http://search.ieice.org/bin/summary.php?id=e96-a_2_635]**Update-Efficient Error-Correcting Regenerating Codes**

Yunghsiang S. Han, Hong-Ta Pai, Rong Zheng, and Pramod K. Varshney

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.4620>]**Update-Efficient Regenerating Codes with Minimum Per-Node Storage**

Yunghsiang S. Han, Hong-Ta Pai, Rong Zheng, and Pramod K. Varshney

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1301.2497>]**Optimal Locally Repairable and Secure Codes for Distributed Storage Systems**

Ankit Singh Rawat, O. Ozan Koyluoglu, Natalia Silberstein, Sriram Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.6954>]**Secure Cooperative Regenerating Codes for Distributed Storage Systems**

O. Ozan Koyluoglu, Ankit Singh Rawat, Sriram Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.3664>]**Enabling Data Integrity Protection in Regenerating-Coding-Based Cloud Storage**

Henry C. H. Chen and Patrick P. C. Lee

Proceedings of the 31st IEEE International Symposium on Reliable Distributed Systems (SRDS 2012), October 2012.

pdf [<http://web.archive.org/web/20161220120259/http://www.cse.cuhk.edu.hk/~pcee/www/pubs/srds12.pdf>] software[<http://web.archive.org/web/20161220120259/http://ansrlab.cse.cuhk.edu.hk/~pcee/software/fmsrdip>]**Exact Regenerating Codes for Byzantine Fault Tolerance in Distributed Storage**

Y. S. Han, R. Zheng and W. H. Mow

INFOCOM 2012

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1108.3883>] More**Progressive Data Retrieval for Distributed Networked Storage**

Y. S. Han, S. Omiwade, and R. Zheng

to appear in IEEE Trans. on Parallel and Distributed Systems, 2012.

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&number=6152094&contentType=Early+Access+Articles&queryText=%3DProgressive+Data+Retrieval+for+Distributed+Networked+Storage>]

tp=&number=6152094&contentType=Early+Access+Articles&queryText=%3DProgressive+Data+Retrieval+for+Distributed+Networked+Storage]

Secret Share Dissemination across a Network

Nihar B. Shah, K. V. Rashmi and Kannan Ramchandran

pdf [http://web.archive.org/web/20161220120259/http://www.eecs.berkeley.edu/~nihar/publications/secret_share_dissemination.pdf] More**On the Confidentiality of Information Dispersal Algorithms and Their Erasure Codes**

Mingqiang Li

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1206.4123>] More**Regenerating Codes for Errors and Erasures in Distributed Storage**

K. V. Rashmi, Nihar B. Shah, Kannan Ramchandran and P. Vijay Kumar

IEEE International Symposium on Information Theory (ISIT), 2012

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1202.1050.pdf>] More**Information-theoretically Secure Regenerating Codes for Distributed Storage**

Nihar B. Shah, K. V. Rashmi and P. Vijay Kumar

Globecom 2011

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1107.5279>] More**Byzantine Fault Tolerance of Regenerating Codes**

Frédérique Oggier and Anwitaman Datta

in Proc. of P2P 2011, 11th IEEE International Conference on Peer-to-Peer Computing

On arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1106.2275>]**Secure Distributive Storage of Decentralized Source Data: Can Interaction Help?**

S. E. Rouayheb, V. Prabhakaran, and K. Ramchandran

in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5513357>] More**Security in Distributed Storage Systems by Communicating a Logarithmic Number of Bits**

T. K. Dikaliotis, A. G. Dimakis, and T. Ho

in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05513354>] More**On Secure Distributed Data Storage Under Repair Dynamics**

S. Pawar, S. E. Rouayheb, and K. Ramchandran

in Proc. 2010 IEEE Int. Symp. Info. Theory (ISIT), June 2010.

arXiv [http://web.archive.org/web/20161220120259/http://arxiv.org/PS_cache/arxiv/pdf/1003/1003.0488v2.pdf] More

Distributed Storage Allocation

General Description of [Distributed Storage Allocation Problems](#)**Distributed Storage Allocation Problems**

Derek Leong, Alexandros G. Dimakis, and Tracey Ho

*Proceedings of the Workshop on Network Coding, Theory, and Applications (NetCod) 2009*IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5191399] Preprint More**Heterogeneity-Aware Erasure Codes for Peer-to-Peer Storage Systems**

Lluís Pamies-Juarez, Pedro García-López, and Marc Sánchez-Artigas

Proceedings of the 38th IEEE International Conference on Parallel Processing (ICPP 2009).

DOI 10.1109/ICPP.2009.15 [<http://web.archive.org/web/20161220120259/http://dx.doi.org/10.1109/ICPP.2009.15>] Preprint

[<http://web.archive.org/web/20161220120259/http://deim.urv.cat/~lluis.pamies/uploads/Main/icpp09-paper.pdf>] [More](#)

Distributed Storage Allocation for High Reliability

Derek Leong, Alexandros G. Dimakis, and Tracey Ho

Proceedings of the IEEE International Conference on Communications (ICC) 2010

IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5502492] Preprint

[More](#)

Memory Allocation in Distributed Storage Networks

Mohsen Sardari, Ricardo Restrepo, Faramarz Fekri, and Emina Soljanin

Proceedings of the IEEE International Symposium on Information Theory (ISIT) 2010

IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5513356] [arXiv](#)

[<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1001.3159>] [More](#)

Symmetric Allocations for Distributed Storage

Derek Leong, Alexandros G. Dimakis, and Tracey Ho

Proceedings of the IEEE Global Telecommunications Conference (GLOBECOM) 2010

IEEE Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5683962] [arXiv](#)

[<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1007.5044>] [Preprint](#) [More](#)

Distributed Storage Allocations

Derek Leong, Alexandros G. Dimakis, and Tracey Ho

IEEE Transactions on Information Theory, vol. 58, no. 7, July 2012

IEEE Xplore [<http://web.archive.org/web/20161220120259/http://dx.doi.org/10.1109/TIT.2012.2191135>] [arXiv](#)

[<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1011.5287>] [Preprint](#) [More](#)

Locality in Distributed Storage

Here we collect papers on codes that optimize for locality (LRCs) as opposed to repair bandwidth.

[Video on Locally repairable codes](http://web.archive.org/web/20161220120259/https://www.youtube.com/watch?v=9Y3uWlgKPkU) [<http://web.archive.org/web/20161220120259/https://www.youtube.com/watch?v=9Y3uWlgKPkU>]

On the Combinatorics of Locally Repairable Codes via Matroid Theory

T. Westerbäck, R. Freij-Hollanti, T. Ernvall and C. Hollanti. (To appear in IEEE Transaction on Information Theory, 2016.)

[arXiv](#) [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1501.00153>]

Constructions and Properties of Linear Locally Repairable Codes

T. Ernvall, T. Westerbäck, C. Hollanti, R. Freij-Hollanti

IEEE Transactions on Information Theory, vol. 62, no. 3, March 2016.

IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7366742/?reload=true&arnumber=7366742>] [arXiv](#)

[<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1410.6339>]

A Connection Between Locally Repairable Codes and Exact Regenerating Codes

T. Ernvall, T. Westerbäck, R. Freij-Hollanti and Camilla Hollanti,

Proceedings of IEEE International Symposium on information Theory (ISIT), 2016.

IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7541379/>] [arXiv](#)

[<http://web.archive.org/web/20161220120259/https://arxiv.org/abs/1603.05846>]

Bounds on the Maximal Minimum Distance of Linear Locally Repairable Codes

A. Pöllänen, T. Westerbäck, R. Freij-Hollanti and Camilla Hollanti,
 Proceedings of IEEE International Symposium on Information Theory (ISIT), 2016.
 IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7541566/>] arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1602.04482>]

Locally Repairable Codes with Availability and Hierarchy: Matroid Theory via Examples

R. Freij-Hollanti, T. Westerbäck and Camilla Hollanti,
 International Zurich Seminar on Communications, March 2016.
 pdf [<http://web.archive.org/web/20161220120259/http://e-collection.library.ethz.ch/eserv/eth:49021/eth-49021-01.pdf>]

Applications of Polymatroid Theory to Distributed Storage

T. Westerbäck, R. Freij-Hollanti and Camilla Hollanti,
 IEEE 53rd Allerton conference on communication, control and computing, September-October 2015.
 IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/7447009/>] arXiv [<http://web.archive.org/web/20161220120259/http://export.arxiv.org/abs/1510.02499>]

Almost Affine Locally Repairable Codes and Matroid Theory

T. Westerbäck, T. Ernvall and Camilla Hollanti,
 Information Theory Workshop (ITW), 2014 IEEE, October 2014.
 IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/6970906/>]

Constructions of Optimal and Almost Optimal Locally Repairable Codes

T. Ernvall, T. Westerbäck and Camilla Hollanti,
 Proceedings of Global Wireless Summit, Aalborg, May 2014.
 IEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/document/6934442/>] arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1406.4277>]

A Family of Optimal Locally Recoverable Codes

I. Tamo and A. Barg, IEEE Transaction on Information Theory, 2015. (Information Theory society Best paper award, 2015) arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1311.3284>] Simons talk Video [<http://web.archive.org/web/20161220120259/https://www.youtube.com/watch?v=B9pm1Mk0g2w>]

Locally Recoverable Codes on Algebraic Curves

A. Barg, I. Tamo, and S. Vladut, Proceedings of the 2015 IEEE ISIT, Hong Kong, June 2015. Xplore [http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=7384487&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D7384487]

Cooperative Local Repair in Distributed Storage

Ankit Singh Rawat, Arya Mazumdar, Sriram Vishwanath
 EURASIP Journal on Advances in Signal Processing, 2015:107, Dec 2015
 download [<http://web.archive.org/web/20161220120259/http://link.springer.com/article/10.1186/s13634-015-0292-0>]

Optimal Locally Repairable Linear Codes

W. Song, S. H. Dau, C. Yuen, T. J. Li
 arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1307.1961>]

Explicit MBR All-Symbol Locality Codes

GM Kamath, N Prakash, V Lalitha, PV Kumar, N Silberstein, AS Rawat, OO Koyluoglu, S Vishwanath
 pdf [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1302.0744.pdf>]

Optimal Locally Repairable Codes via Rank-Metric Codes

N Silberstein, AS Rawat, OO Koyluoglu, S Vishwanath

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1301.6331.pdf>]

Storage codes--coding rate and repair locality

HDL Hollmann

pdf [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1301.4300.pdf>]

Repairable Fountain Codes

Megasthenis Asteris, Alexandros G. Dimakis

pdf [<http://web.archive.org/web/20161220120259/https://web.space.utexas.edu/ma32547/repository/ISIT2012-RepairableFountainCodes.pdf>] [slides.pdf](#) [<http://web.archive.org/web/20161220120259/https://web.space.utexas.edu/ma32547/repository/ISIT2012-RepairableFountainCodes-Presentation.pdf>] [More](#) [<http://web.archive.org/web/20161220120259/https://web.space.utexas.edu/ma32547/repairable-fountain-isit2012.html>]

Bounds on the Size of Locally Recoverable Codes

Viveck Cadambe, Arya Mazumdar

IEEE Transactions on Information Theory, vol. 61, no. 11, Nov 2015.

IEEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7247728>]

An Upper Bound On the Size of Locally Recoverable Codes

Viveck Cadambe, Arya Mazumdar

IEEE Int. Symp. Network Coding, Jun. 7-9, 2013.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1308.3200>]

On the Locality of Codeword Symbols

P. Gopalan, C. Huang, H. Simitci, and S. Yekhanin

IEEE Trans. Inf. Theory, vol. 58, no. 11, pp. 6925–6934, Nov. 2012.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1106.3625>]

Codes with Local Regeneration

G. M. Kamath, N. Prakash, V. Lalitha, P. V. Kumar

arXiv, Nov. 2012.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1211.1932>]

Update-Efficiency and Local Repairability Limits for Capacity Approaching Codes

Arya Mazumdar, Venkat Chandar, Gregory Wornell

IEEE Journal on Selected Areas of Communications, vol. 32, no. 5, May 2014.

download [<http://web.archive.org/web/20161220120259/https://people.cs.umass.edu/~arya/papers/JSAC-final.pdf>]

Storage Capacity of Repairable Networks

Arya Mazumdar

IEEE Transactions on Information Theory, vol. 61, no. 11, Nov 2015.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1408.4862>]

Optimal locally repairable and secure codes for distributed storage systems

A. S. Rawat, O. O. Koyluoglu, N. Silberstein, S. Vishwanath

arXiv, Oct. 2012.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1210.6954>]

Error Resilience in Distributed Storage via Rank-Metric Codes

N. Silberstein, A. S. Rawat, S. Vishwanath
Proc. Fiftieth Annual Allerton Conference on Communication, Control, and Computing, Oct. 2012.
arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1202.0800>]

Locally repairable codes

D. S. Papailiopoulos, A. G. Dimakis
Proc. IEEE Int. Symp. Inf. Theory (ISIT), Cambridge, MA, Jul. 2012.
arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1206.3804>]

Erasure coding in windows azure storage

C. Huang, H. Simitci, Y. Xu, A. Ogus, B. Calder, P. Gopalan, J. Li, S. Yekhanin
Proc. 2012 USENIX Annual Technical Conference, Boston, MA, Jun. 2012.
pdf [http://web.archive.org/web/20161220120259/https://www.usenix.org/system/files/conference/atc12/atc12-final181_0.pdf]

Homomorphic Self-repairing Codes for Agile Maintenance of Distributed Storage Systems

Frederique Oggier and Anwitaman Datta,
On arXiv: July 2011. Preprint
Note: This is a substantially extended version of an earlier work published in Infocom 2011
Project homepage [<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/>]

Self-Repairing Codes for Distributed Storage - A Projective Geometric Construction

Frederique Oggier and Anwitaman Datta,
In IEEE Information Theory Workshop (ITW) 2011.
[arXiv](#)
More Project Homepage [<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/>]

Self-repairing Homomorphic Codes for Distributed Storage Systems

F. Oggier, A. Datta
in Proc. 2011 IEEE International Conference on Computer Communications (INFOCOM)
Arxiv, July 2010.
Note: A substantially extended version of this work is now available
arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1008.0064>] [More](#)

Redundancy Generation in Distributed Storage

[General Description of Redundancy Generation Problem in Distributed Storage](#)

Decentralized Erasure Coding for Efficient Data Archival in Distributed Storage Systems

Lluis Parnies-Juarez, Frédérique Oggier, Anwitaman Datta
Proceedings of the 14th International Conference on Distributed Computing and Networking (ICDCN) 2013

RapidRAID: Pipelined Erasure Codes for Fast Data Archival in Distributed Storage Systems

Lluis Parnies-Juarez, Anwitaman Datta, Frédérique Oggier
arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1207.6744>] [More](#)

In-Network Redundancy Generation for Opportunistic Speedup of Backup

Lluis Parnies-Juarez, Anwitaman Datta, Frédérique Oggier
arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1111.4533>] [More](#)

Non-homogeneous Distributed Storage Systems

Non-homogeneous Two-rack Model for Distributed Storage Systems

J. Pernas, B. Gaston, C. Yuen, J. Pujol
ISIT 2013.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1307.8201>]

Non-homogeneous Distributed Storage Systems

V. T. Van, C. Yuen, J. Li
Allerton 2012.

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/pdf/1208.2078>]

Surveys

Data Insertion & Archiving in Erasure-coding Based Large-scale Storage Systems

Lluís Pamies-Juarez, Frédérique Oggier, Anwitaman Datta

Paper accompanying invited talk at International Conference on Distributed Computing and Internet Technologies (ICDCIT 2013)

pdf [<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/pdf/icdcit13.pdf>]

Coding Techniques for Repairability in Networked Distributed Storage Systems

Frederique Oggier, Anwitaman Datta

NOW Monograph [<http://web.archive.org/web/20161220120259/http://dx.doi.org/10.1561/0100000068>] preprint

[<http://web.archive.org/web/20161220120259/http://sands.sce.ntu.edu.sg/CodingForNetworkedStorage/pdf/longsurvey.pdf>]

An Overview of Codes Tailor-made for Networked Distributed Data Storage

Anwitaman Datta, Frederique Oggier

arXiv [<http://web.archive.org/web/20161220120259/http://arxiv.org/abs/1109.2317>]

A Survey on Network Codes for Distributed Storage

A. G. Dimakis, K. Ramchandran, Y. Wu, C. Suh,
Proceedings of the IEEE, March 2011, Vol 99, No 3.

IEEEExplore [<http://web.archive.org/web/20161220120259/http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5709963>]