

PUBLICATIONS

JOURNAL PAPERS

Submitted

1. M. Riabiz, T. Ardeshiri, I. Kontoyiannis and S. Godsill. “Nonasymptotic Gaussian approximation for inference with stable noise.” Submitted.
2. R. Cavallari, S. Toumpis, R. Verdone and I. Kontoyiannis. “Packet speed and cost in mobile wireless delay-tolerant networks.” Submitted.
3. A.M. Devraj, I. Kontoyiannis and S.P. Meyn. “Geometric ergodicity in a weighted Sobolev space.” Submitted.

Published or in press

4. M. Madiman and I. Kontoyiannis. “Entropy bounds on abelian groups and the Ruzsa divergence.” *IEEE Transactions on Information Theory*, **64**, no. 1, pp. 77-92, January 2018.
5. I. Kontoyiannis and S.P. Meyn. “Approximating a diffusion by a hidden Markov model.” *Stochastic Processes and their Applications*, **127**, no. 8, pp. 2482-2507, August 2017.
6. I. Kontoyiannis and S.P. Meyn. “On the f -norm ergodicity of Markov processes in continuous time.” *Electronic Communications in Probability*, **21**, paper 77, pp. 1–10, November 2016.
7. I. Kontoyiannis and M. Skoularidou. “Estimating the directed information and testing for causality.” *IEEE Transactions on Information Theory*, **62**, no. 11, pp. 6053–6067, November 2016.
8. I. Kontoyiannis and M. Madiman. “Sumset and inverse sumset inequalities for differential entropy and mutual information.” *IEEE Transactions on Information Theory*, **60**, no. 8, pp. 4503–4514, August 2014.
9. I. Kontoyiannis and S. Verdú. “Optimal lossless data compression: Non-asymptotics and asymptotics.” *IEEE Transactions on Information Theory*, **60**, no. 2, pp. 777–795, February 2014.
10. O. Johnson, I. Kontoyiannis and M. Madiman. “Log-concavity, ultra-log-concavity and a maximum entropy property of discrete compound Poisson measures.” *Discrete Applied Mathematics*, (Special issue, Proceedings of the Jubilee Conference on Discrete Mathematics JCDM 2009, D.J. Kleitman, A. Shastri, V.T. So’s, eds.) **161**, no. 9, pp. 1232-1250, June 2013.
11. C. Gioran and I. Kontoyiannis. “Complexity-compression tradeoffs in lossy compression via efficient random codebooks and databases.” *Problems of Information Transmission*, **48**, Issue 4, pp. 376-394, October 2012.
12. I. Kontoyiannis and S.P. Meyn. “Geometric ergodicity and the spectral gap of non-reversible Markov chains.” *Probability Theory and Related Fields*, **154**, Issue 1-2, pp. 327–339, October 2012.
13. V. Anantharam, G. Caire, M. Costa, I. Kontoyiannis, G. Kramer, R. Yeung, and S. Verdú. “Panel on *New Perspectives on Information Theory*.” (Invited discussion.) *IEEE Information Theory Society Newsletter*, pp. 21–27, March 2012.
14. P. Dellaportas and I. Kontoyiannis. “Control variates for estimation based on reversible Markov chain Monte Carlo samplers.” *Journal of the Royal Statistical Society: Series B*, **74**, Issue 1, pp. 133-161, January 2012.
15. P. Harremoës, O. Johnson and I. Kontoyiannis. “Thinning, entropy and the law of thin numbers.” *IEEE Transactions on Information Theory*, **56**, no. 9, pp. 4228–4244, September 2010.

16. A.D. Barbour, O. Johnson, I. Kontoyiannis and M. Madiman. “Compound Poisson approximation via information functionals.” *Electronic Journal of Probability*, **15**, paper 42, pp. 1344–1369, August 2010.
17. I. Kontoyiannis. “Book review: “*Information and complexity in statistical modeling*,” by J. Rissanen, Springer, NY, 2007.” *Amer. Math. Monthly*, **115**, no. 10, pp. 956–960, December 2008.
18. I. Kontoyiannis and S.P. Meyn. “Computable exponential bounds for screened estimation and simulation.” *Annals of Applied Probability*, **18**, no. 4, pp. 1491–1518, August 2008.
19. M. Harrison and I. Kontoyiannis. “Estimation of the rate-distortion function.” *IEEE Transactions on Information Theory*, **54**, no. 8, pp. 3757–3763, August 2008.
20. Y. Gao, I. Kontoyiannis and E. Bienenstock. “Estimating the entropy of binary time series: Methodology, some theory and a simulation study.” *Entropy*, **10**, issue 2, pp. 71–99, June 2008.
21. I. Kontoyiannis. “Counting the primes using entropy.” *IEEE Information Theory Newsletter*, **58**, no. 2, pp. 6–9, June 2008.
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24. I. Kontoyiannis and R. Zamir. “Mismatched codebooks and the role of entropy-coding in lossy data compression.” *IEEE Transactions on Information Theory*, **52**, pp. 1922–1938, May 2006.
25. A. Anagnostopoulos, I. Kontoyiannis, and E. Upfal. “Steady state analysis of balanced-allocation routing,” *Random Structures & Algorithms*, **26**, pp. 446–467, July 2005.
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BOOK CHAPTERS

- Ch1. I. Kontoyiannis. “Some information-theoretic computations related to the distribution of prime numbers,” In *Festschrift in Honor of Jorma Rissanen*, (P. Grunwald, P. Myllymaki, I. Tabus, M. Weinberger, B. Yu, eds.), pp. 135–143, Tampere University Press, May 2008.
- Ch2. I. Kontoyiannis and Yu.M. Suhov. “Prefixes and the entropy rate for long-range sources,” Chapter 6 in *Probability Statistics and Optimization: A Tribute to Peter Whittle*, (F.P. Kelly, editor), pp. 89–98, Wiley, Chichester, 1994.

PATENTS

- P1. V. Castelli, I. Kontoyiannis, J. Robinson and J.J. Turek. U.S. Patent No. 6,021,224. “Multiresolution lossless/lossy compression and storage of data for efficient processing thereof.” Oct 2000.
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- U1. A. Anagnostopoulos, C. Dombry, N. Guillotin-Plantard, I. Kontoyiannis and E. Upfal. “Probabilistic analysis of the k -server problem on the circle.” *arXiv online manuscript*, May 2010.
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- U4. I. Kontoyiannis. “The complexity and entropy of literary styles.” *NSF Technical Report no. 97, Department of Statistics, Stanford University*, June 1996.
- U5. I. Kontoyiannis, J. Turek, V. Castelli and J. Robinson. “Multiresolution lossless image compression.” Unpublished manuscript, December 1995.

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- Vol2. *Third Workshop on Information Theoretic Methods in Science and Engineering*. Proceedings. Edited by J. Heikkonen, I. Kontoyiannis, E.P. Liski, P. Myllymaki, J. Rissanen and I. Tabus. Tampere University Press, August 2010. ISBN 978-952-15-2000-6.
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CONFERENCES (papers/talks)

- C1. “Variable-dimension MCMC for model selection of discrete time series.” **Invited talk**, *IEEE Conference on Decision and Control*, Miami Beach, FL, USA, December 2018.
- C2. “Deep tree models for ‘Big’ biological data.” **Invited paper**, *IEEE International Workshop on Signal Processing Advances in Wireless Communications*, Kalamata, Greece, June 2018.
- C3. “Analysis of a one-dimensional continuous DTN model,” with D. Cheliotis, M. Loulakis and S. Toumpis. **Invited paper**, *IEEE International Workshop on Signal Processing Advances in Wireless Communications*, Kalamata, Greece, June 2018.
- C4. “Asymptotics of the packet speed and cost in a mobile wireless network model,” with S. Toumpis, R. Cavallari and R. Verdone. *2018 IEEE International Symposium on Information Theory*, Vail, CO, USA, June 2018.
- C5. “Sharp gaussian approximation bounds for linear systems with α -stable noise,” with M. Riabiz, T. Ardeshiri and S. Godsill. *2018 IEEE International Symposium on Information Theory*, Vail, CO, USA, June 2018.
- C6. “Bayesian suffix trees and context tree weighting.” **Plenary talk**, *International Zurich Seminar on Communications*, Zurich, Switzerland, February 2018.
- C7. “Small Big Data: Temporal structure in discrete time series.” **Invited talk**, *Theoretical & Algorithmic Underpinnings of Big Data Workshop*, Isaac Newton Institute, Cambridge, UK, January 2018.

- C8. “Simulated convergence rates with application to an intractable α -stable inference problem,” with M. Riabiz, T. Ardeshiri and S. Godsill. **Invited paper**, *2017 IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, Curaçao, Dutch Antilles, December 2017.
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- C10. “Exponential ergodicity in a Sobolev space,” with A.M. Devraj and S.P. Meyn. **Invited talk**, *PDE and Probability Methods for Interactions*, Sophia Antipolis, France, March 2017.
- C11. “Context trees and model selection for discrete time series.” **Invited talk**, *2016 IEEE Information Theory Workshop*, Cambridge, UK, September 2016.
- C12. “Model selection algorithms for discrete time series.” **Keynote lecture**, *11th Athens Colloquium on Algorithms & Complexity*, Athens, Greece, August 2016.
- C13. “Testing temporal causality and estimating directed information.” **Invited talk**, *Nexus of Information and Computation Theories*, Institut Henri Poincaré, Paris, France, March 2016.
- C14. “Entropy bounds on abelian groups and the Ruzsa divergence,” with M. Madiman. **Invited talk**, *2016 Information Theory and Applications Workshop*, University of California, San Diego, February 2016.
- C15. “Finding structure in data: Bayesian inference for discrete time series.” **Invited talk**, *Stochastic Methods in Finance and Physics Workshop*, Heraklion, Greece, July 2015.
- C16. “Small trees & long memory: Bayesian inference for discrete time series.” **Plenary talk**, *16th Conference of the ASMDA Intern’al Society*, Piraeus, Greece, July 2015.
- C17. “The Ruzsa divergence on groups,” with M. Madiman. **Invited paper**, *2015 Workshop on Information Theoretic Methods in Science and Engineering*, Copenhagen, Denmark, June 2015.
- C18. “Causality and directed information estimation as a hypothesis test,” with M. Skoulariidou. **Invited paper**, *2015 Workshop on Information Theoretic Methods in Science and Engineering*, Copenhagen, Denmark, June 2015.
- C19. “The entropy of sums and Ruzsa’s divergence on abelian groups,” with M. Madiman. **Invited paper**, *2013 IEEE Information Theory Workshop*, Sevilla, Spain, September 2013.
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- C23. “Bayesian inference for discrete time series via tree weighting,” with M. Skoulariidou and A. Panotopoulou. **Invited paper**, *2012 IEEE Information Theory Workshop*, Lausanne, Switzerland, September 2012.
- C24. “Sunset inequalities for differential entropy and mutual information,” with M. Madiman. *2012 IEEE International Symposium on Information Theory*, M.I.T., Cambridge, MA, July 2012.
- C25. “Lossless data compression rate: Asymptotics and non-asymptotics,” with S. Verdú. **Invited paper**, *46th Annual Conference on Information Sciences and Systems*, Princeton, NJ, March 2012.
- C26. “Sunset differential entropy bounds,” with M. Madiman. **Invited talk**, *International Zurich Seminar on Communications*, Zurich, Switzerland, March 2012.

- C27. “Differential entropy sumset bounds.” **Invited talk**, *Fourth EPFL-UMLV International Workshop on Random Matrices, Information Theory and Applications*, Paris, France, December 2010.
- C28. “Markov chains and the spectra of nonlinear operators,” with S.P. Meyn. **Invited talk**, *Young Researchers in Analysis Workshop*, Athens, November 2010.
- C29. “Geometric ergodicity and the spectral gap of non-reversible Markov chains,” with Sean P. Meyn. **Invited talk**, *Fifth International Workshop on Applied Probability*, Madrid, Spain, July 2010.
- C30. “Stochastic analysis of the k -server problem on the circle,” with A. Anagnostopoulos, C. Dombry, N. Guillin-Plantard and E. Upfal. *21st International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA 2010)*, June-July 2010.
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- C33. “Superposition codes for Gaussian vector quantization,” with K. Rahnama Rad and S. Gitzenis. **Invited paper**, *2010 IEEE Information Theory Workshop*, Cairo, Egypt, January 2010.
- C34. “Which spectrum?” with S.P. Meyn. **Invited talk**, *Athens Workshop on MCMC Convergence and Estimation*, Athens, Greece, September 2009.
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- C37. “Control variates for MCMC.” *Greek Stochastics α'* , with P. Dellaportas and Z. Tsourti. Lefkada, Greece, August 2009.
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- C39. “Efficient random codebooks and databases for lossy data compression,” with C. Gioran. **Invited paper**, *2009 IEEE Information Theory Workshop*, Volos, Greece, June 2009.
- C40. “Information-theoretic ideas in Poisson approximation and estimation.” **Invited talk**, *Interface between Information Theory and Estimation Theory Workshop*, Princeton University, April 2009.
- C41. “Control variates as screening functions,” with S. Kyriazopoulou-Panagiotopoulou and S.P. Meyn. *Third International Conference on Performance Evaluation Methodologies and Tools*, Athens, Greece, October 2008.
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- C51. “Exponential bounds and stopping rules for MCMC and general Markov chains,” with L.A. Lastras-Montaña and S.P. Meyn. **Invited paper**, *First International Conference on Performance Evaluation Methodologies and Tools*, Pisa, Italy, October 2006.
- C52. “Information-theoretic ideas in Poisson approximation and concentration.” **Invited series of talks**, *LMS/EPSRC Meeting on Stochastic Stability, Large Deviations and Coupling Methods*, Edinburgh, UK, September 2006.
- C53. “On estimating the rate-distortion function,” with M. Harrison. *2006 IEEE International Symposium on Information Theory*, Seattle, WA, July 2006.
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- C60. “Relative entropy and exponential deviation bounds for general Markov chains,” with L. Lastras-Montaña and S.P. Meyn. *2005 IEEE International Symposium on Information Theory*, Adelaide, Australia, September 2005.
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- C63. “Entropy, compound Poisson approximation, log-Sobolev inequalities and measure concentration,” with M. Madiman. *2004 IEEE Information Theory Workshop*, San Antonio, TX, October 2004.

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- C75. “MDL ideas in lossy data compression.” **Invited talk**, *MSRI Information Theory Workshop*, Berkeley, CA, March 2002.
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- C83. “On rate-distortion theory as a convex selection problem.” **Invited paper**, *38th Annual Allerton Conference on Communication, Control & Computing*, October 2000.
- C84. “Probabilistic phenomena in data compression.” **Invited talk** at the *Sixth International Seminar on the Analysis of Algorithms*, Krynica Morska, Poland, July 2000.
- C85. “Model selection via rate-distortion theory.” **Invited paper**, *34th Annual Conference on Information Sciences and Systems*, Princeton, NJ, March 2000.
- C86. “Probabilistic results for sphere packing in high dimensions.” *1999 Joint Statistical Meetings of IMS-ASA-ENAR/WNAR*, Baltimore, MD, August 1999.
- C87. “How well does the Shannon codebook compress?” *1999 Canadian Information Theory Workshop*, Kingston, Ontario, June 1999.
- C88. “Asymptotically optimal lossy Lempel-Ziv coding.” *1998 IEEE International Symposium on Information Theory*, MIT, Cambridge, MA, August 1998.
- C89. “Generalized waiting times and efficient lossy coding for memoryless sources.” *1998 IEEE Information Theory Workshop*, San Diego, CA, February 1998.
- C90. “Second-order analysis of lossless and lossy versions of Lempel-Ziv codes.” **Invited paper**, *31st Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 1997.
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