

Power saving experiments for large-scale global optimisation



immediate access to the latest key research articles

Authors: David R. Easterling ^a;

Affiliations:^a Department of Computer Science, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA

^b Department of Computer Science and Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA

DOI: 10.1080/17445760903492078

Publication Frequency: 6 issues per year

Published in: International Journal of Parallel, Emergent and Distributed Systems

First Published on: 12 February 2010

Subjects: Algorithms & Complexity; Computer Engineering; Computer Science (General); Distributed Network Systems; Distributed Systems; Internet & Multimedia; Neural Networks; Parallel Algorithms; Parallel Systems; Programming & Programming Languages; Quantum Information; Systems & Computer Architecture;

Formats available: HTML (English) : PDF (English)

Previously published as: Parallel Algorithms and Applications (1063-7192) until 2005

References

1. Allen, N. A. , Chen, K. C. , Tyson, J. J. , Shaffer, C. A. and Watson, L. T. (2006) Computer evaluation of network dynamics models with application to cell cycle control in budding yeast. *IIE Syst. Biol.* **153**:1 , pp. 13-21. [\[your library's links\]](#) [\[crossref\]](#)
2. G.M. Amdahl, Validity of the single processor approach to achieving large scale computing capabilities, in Proceedings of 1967 Spring Joint Computer Conference, April 18-20, ACM, New York, NY, 1967, pp. 483-585
3. Aster, R. , Borchers, B. and Thurber, C. (2004) *Parameter Estimation and Inverse Problems* Elsevier Academic Press , New York, NY [\[your library's links\]](#)
4. Baker, C. A. , Watson, L. T. , Grossman, B. , Haftka, R. T. and Mason, W. H. Paprzycki, M. , Tarricone, L. and Yang, L. T. (eds) (2000) Parallel global aircraft configuration design space exploration. *Practical Parallel Computing* pp. 79-96. Nova Science Publishers Inc. , Commack, NY [\[your library's links\]](#)
5. Bartholomew-Biggs, M. C. , Parkhurst, S. C. and Wilson, S. P. (2003) Global optimization approaches to an aircraft routing problem. *European J. Oper. Res.* **146**:2 , pp. 417-431. [\[your library's links\]](#) [\[crossref\]](#)
6. Cao, Z. , Watson, L. T. , Cameron, K. W. and Ge, R. Wainer, G. , Chinni, M. , Roman, P. , Rajaei, H. , Zeigler, B. and Ribbens, C. (eds) (2009) A power aware study for VTDIRECT95 using DVFS. *Proceedings of 2009 Spring Simulation Multiconference: HPC* pp. 531-536. Society for Modeling and Simulation International , San Diego, CA [\[your library's links\]](#)

7. Carter, R. G. , Gablonsky, J. M. , Patrick, A. , Kelly, C. T. andEslinger, O. J. (2001) Algorithms for noisy problems in gas transmission pipeline optimization. *Optim. Engrg.* **2**:2 , pp. 139-157. [\[your library's links\]](#) [\[crossref\]](#)
8. Cho, S. andMelhem, R. (2008) Corollaries to Amdahl's law for energy. *IEEE Comput. Archit. Lett.* **7**:1 , pp. 25-28. [\[your library's links\]](#) [\[crossref\]](#)
9. D.E. Finkel and C.T. Kelley, Convergence analysis of the DIRECT algorithm, Optimization Online Digest (August 2004). Available at http://www.optimization-online.org/ARCHIVE_DIGESTS/2004-08.html
10. Freeh, V. W. , Pan, F. , Lowenthal, D. K. , Kappiah, N. , Springer, R. , Rountree, B. L. andFemal, M. E. (2007) Analyzing the energy-time tradeoff in high-performance computing applications. *IEEE Trans. Parallel Distrib. Systems* **18**:6 , pp. 835-848. [\[your library's links\]](#) [\[crossref\]](#)
11. Ge, R. , Feng, X. andCameron, K. W. (2005) Performance-constrained distributed DVS scheduling for scientific applications on power-aware clusters. *Proceedings of ACM/IEEE Conference on Supercomputing* p. 34. Computer Society , Washington, DC [\[your library's links\]](#)
12. Ge, R. , Feng, X. , Feng, W. andCameron, W. (2007) CPU MISER: A performance-directed, run-time system for power-aware clusters. *Proceedings of International Conference on Parallel Processing* p. 18. IEEE Computer Society , Washington, DC [\[your library's links\]](#)
13. Gropp, W. , Lusk, E. andThakur, R. (1999) *Using MPI-2: Advanced Features of the Message-Passing Interface* MIT Press , Cambridge, MA [\[your library's links\]](#) [\[crossref\]](#)
14. He, J. , Verstak, A. , Sosonkina, M. andWatson, L. T. (2009) Performance modeling and analysis of a massively parallel DIRECT: Part 2. *Internat. J. High Perform. Comput. Appl.* **23**:1 , pp. 29-41. [\[your library's links\]](#) [\[crossref\]](#)
15. He, J. , Verstak, A. , Watson, L. T. andSosonkina, M. (2009) Performance modeling and analysis of a massively parallel DIRECT: Part 1. *Internat. J. High Perform. Comput. Appl.* **23**:1 , pp. 14-28. [\[your library's links\]](#) [\[crossref\]](#)
16. He, J. , Verstak, A. , Watson, L. T. , Stinson, C. A. , Ramakrishnan, N. , Shaffer, C. A. , Rappaport, T. S. , Anderson, C. R. , Bae, K. , Jiang, J. andTranter, W. H. (2004) Globally optimal transmitter placement for indoor wireless communication systems. *IEEE Trans. Wireless Commun.* **3**:6 , pp. 1906-1911. [\[your library's links\]](#) [\[crossref\]](#)
17. He, J. , Watson, L. T. , Ramakrishnan, N. , Shaffer, C. A. , Verstak, A. , Jiang, J. , Bae, K. andTranter, W. H. (2002) Dynamic data structures for a direct search algorithm. *Comput. Optim. Appl.* **23**:1 , pp. 5-25. [\[your library's links\]](#) [\[crossref\]](#)
18. He, J. , Watson, L. T. andSosonkina, M. (2009) Algorithm 897: VTDIRECT95: Serial and parallel codes for the global optimization algorithm DIRECT. *ACM Trans. Math. Software* **36**:3 , pp. 1-24. — Art. 17 [\[your library's links\]](#) [\[crossref\]](#)
19. Hsu, C. andFeng, W. (2005) A power-aware run-time system for high-performance computing. *Proceedings of ACM/IEEE Conference on Supercomputing* p. 1. IEEE Computer Society , Washington, DC [\[your library's links\]](#)
20. Hsu, C. andKremer, U. (2003) The design, implementation, and evaluation of a compiler

algorithm for CPU energy reduction. *Proceedings of ACM SIGPLAN 2003 Conference on Programming Languages* pp. 38-48. ACM , New York, NY [your library's links]

21. Jones, D. R. , Pertunen, C. D. andStuckman, B. E. (1993) Lipschitzian optimization without the Lipschitz constant. *J. Optim. Theory Appl.* **79**:1 , pp. 57-181. [your library's links] [crossref]
22. Kim, W. , Gupta, M. S. , Wei, G. andBrooks, D. (2008) System level analysis of fast, per-core DVFS using on-chip switching regulators. *Proceedings of 14th International Symposium on High-Performance Computer Architecture* pp. 123-134. IEE , Piscataway, NJ [your library's links]
23. Lim, M. Y. , Freeh, V. W. andLowenthal, K. (2006) Adaptive, transparent frequency and voltage scaling of communication phases in MPI programs. *Proceedings of ACM/IEEE Conference on Supercomputing* p. 107. ACM , New York, NY [your library's links] [crossref]
24. Ljungberg, K. , Holmgren, S. andCarlborg, Ö. (2004) Simultaneous search for multiple QTL using the global optimization algorithm DIRECT. *Bioinformatics* **20**:12 , pp. 1887-1895. [your library's links] [pubmed] [crossref]
25. Panda, D. K. (2009) *MVAPICH2 1.2 User's Guide* Department of Computer Science and Engineering, Ohio State University , Columbus, OH — <http://mvapich.cse.ohio-state.edu> [your library's links]
26. Panning, T. D. , Watson, L. T. , Allen, N. A. , Chen, K. C. , Shaffer, C. A. andTyson, J. J. (2008) Deterministic parallel global parameter estimation for a model of the budding yeast cell cycle. *J. Global Optim.* **40**:4 , pp. 719-738. [your library's links] [crossref]
27. H. Pohleim, GEATbx: Genetic and evolutionary algorithm toolbox for use with Matlab documentation, Ph.D. thesis, Technical University Ilmenau, Germany, 1996
28. K. Radhakrishnan and A.C. Hindmarsh, Description and use of LSODE, the Livermore solver for ordinary differential equations, LLNL report UCRL-ID-113855, December 1993
29. Zhu, H. andBogy, D. B. (2002) DIRECT algorithm and its application to slider air-bearing surface optimization. *IEEE Trans. Magnetics* **38**:5 , pp. 2168-2170. [your library's links] [crossref]
30. Zwolak, J. W. , Tyson, J. J. andWatson, L. T. (2005) Globally optimized parameters for a model of mitotic control in frog egg extracts. *IEE Syst. Biol.* **152**:2 , pp. 81-92. [your library's links] [crossref]