Curriculum Vitae

John Tromp
CWI
P.O. Box 94079
1090 GB Amsterdam
The Netherlands
http://www.cwi.nl/~tromp/
John.Tromp@gmail.com

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1 Research Interests

Algorithms, Data Structures, Complexity Theory, Kolmogorov Complexity, Distributed Algorithms, Wait-Free Shared Memory, Machine Models, Programming Languages, Computational Biology, Board Games.

2 Education

12/93 Ph.D. in Computer Science at the University of Amsterdam, under supervision of Prof. P.M.B. Vitányi.

04/89 Doctoral exam (M.Sc. equivalent; cum laude) in Computer Science at the University of Amsterdam, under supervision of Prof. P.M.B. Vitányi.

3 Positions

01/07 – now Computer Scientist at Renaissance Technologies LLC

04/02 – 08/06 Researcher at the Center for Mathematics and Computer Science (CWI) in Amsterdam.

04/96 – 04/02 Postdoc at CWI in Amsterdam.

02/01 – 02/02 Software developer at Bioinformatics Solutions Inc. in Waterloo, Canada.

08/96 – 09/96 Researcher at DigiCash in Amsterdam.

01/94 – 12/95 NSERC International Fellow, Computer Science Department, University of Waterloo, Canada.

06/89 – 12/93 Ph.D. student at CWI and the University of Amsterdam.

05/92 – 06/92 Scientific visitor, Computer Science Department, Technion, Israel.

09/90 – 10/90 Scientific visitor, Computer Science Department, University of Waterloo, Canada.

10/88 – 05/89 Trainee at the CWI, investigating wait-free variable constructions.

4 Honors and Awards

Contests

- Winner of Waterloo regional ACM Programming contest, Oct. 1994, University of Waterloo, Canada.
- Joint winner of the 1989 International Obfuscated C Code Contest (IOCCC) with a 1467 character Tetris program (making up for my non-winning 1988 maze.c entry).
- Frequent solver of IBM's monthly "Ponder This" challenge.

Grants

- Canada International Fellowship, Jan 1994–Dec 1994, University of Waterloo, Canada.

5 Programming Experience

Languages

Sinclair BASIC, Z80 assembly, Pascal, 68000 assembly, Scheme, C, C++, PostScript, Java, Python, Ruby, Haskell.

Selected Projects

- The Fhourstones integer CPU benchmark, available in C, Java, and Haskell (`http://www.cwi.nl/~tromp/c4/fhour.html`).
- Homology search software PatternHunter (commercial but freely available for academic use; `http://www.bioinformaticssolutions.com/products/ph/`).
- A minimal universal binary language (`http://www.cwi.nl/~tromp/cl/cl.html`).
- A Go position counting program (`http://www.cwi.nl/~tromp/go/legal.html`).

6 Publications

Refereed Journal Publications

[1] John Tromp. On update-last schemes. *Parallel Processing Letters*, 3(1):25–28, 1993.

[2] Avrim Blum, Tao Jiang, Ming Li, John Tromp, and Mihalis Yannakakis. Linear approximation of shortest superstrings. *J. ACM*, 41(4):630–647, 1994.

[3] John Tromp and Jeffrey Shallit. Subword complexity of a generalized thue-morse word. *Information Processing Letters*, 54(06):313–316, 1995.

[4] Siegfried Lehr, Jeffrey Shallit, and John Tromp. On the vector space of the automatic reals. *Theoretical Computer Science*, 163(01):193–210, 1996.

[5] Ming Li, John Tromp, and Paul Vitányi. How to share concurrent wait-free variables. *J. ACM*, 43(4):723–746, 1996.

[6] Thomas Hancock, Tao Jiang, Ming Li, and John Tromp. Lower bounds on learning decision lists and trees. *Information and Computation*, 126(02):114–122, 1996.

[7] Ming Li, John Tromp, and Louxin Zhang. On the nearest neighbour interchange distance between evolutionary trees. *J. Theor. Biol.*, 182:463–467, 1996.

[8] John Tromp, Louxin Zhang, and Y. Zhao. Small weight bases for hamming codes. *Theoretical Computer Science*, 181(2):337–345, 1997.

[9] John Kececioglu, Ming Li, and John Tromp. Inferring a dna sequence from erroneous copies. *Theoretical Computer Science*, 185(1):3–13, 1997.

[10] Ming Li, John Tromp, and Paul Vitányi. Reversible simulation of irreversible computation. *Physica D*, 120:168–176, 1998.

[11] Harry Buhrman, Ming Li, John Tromp, and Paul Vitányi. Kolmogorov random graphs and the incompressibility method. *SIAM Journal on Computing*, 29(2):550–599, 1999.

[12] Harry Buhrman, Matt Franklin, Juan Garay, Jaap-Henk Hoepman, John Tromp, and Paul Vitányi. Mutual search. *Journal of the ACM*, 46(4):517–536, July 1999.

[13] Bhaskar DasGupta, Xin He, Tao Jiang, Ming Li, and John Tromp. On the linear-cost subtree-transfer distance between phylogenetic trees. *Algorithmica*, 25(2-3):176–195, 1999.

[14] Frederic Gruau and John Tromp. Cellular gravity. *Parallel Processing Letters*, 10(4):383–393, 2000.

[15] Harry Buhrman, John Tromp, and Paul M. B. Vitányi. Time and space bounds for reversible simulation. *Journal of Physics A*, 34(35):6821–6830, 2001.

[16] Péter Gács, John Tromp, and Paul M. B. Vitányi. Algorithmic statistics. *IEEE Transactions on Information Theory*, 47(6):2443–2463, 2001.

[17] Ming Li, Bin Ma, and John Tromp. Patternhunter: Faster and more sensitive homology search. *Bioinformatics*, 18(3):440–445, 2002.

[18] Xin Chen, Ming Li, and John Tromp. Dnacompress: fast and effective dna sequence compression. *Bioinformatics*, 18(12):1696–1698, 2002.

[19] John Tromp and Paul Vitányi. Randomized two-process wait-free test-and-set. *Distributed Computing*, 15(3):127–135, 2002.

[20] Péter Gács, John Tromp, and Paul M. B. Vitányi. Correction to "algorithmic statistics". *IEEE Transactions on Information Theory*, 48(8):2427, 2002.

[21] Ming Li, John Tromp, and Paul Vitányi. Sharpening occam's razor. *Information Processing Letters*, 85(5):267–274, March 2003.

[22] Ming Li, Bin Ma, Derek Kisman, and John Tromp. Patternhunter ii: Highly sensitive and fast homology search. *Genome Informatics*, 14:164–175, 2003. early version of LMKT04.

[23] Ming Li, Bin Ma, Derek Kisman, and John Tromp. Patternhunter ii: Highly sensitive and fast homology search. *Journal of Bioinformatics and Computational Biology*, 2(3):417–439, 2004.

[24] Uri Keich, Ming Li, Bin Ma, and John Tromp. On spaced seeds for similarity search. *Discrete Applied Mathematics*, 138(3):253–263, June 2004.

[25] Rudi Cilibrasi, Leo van Iersel, Steven Kelk, and John Tromp. The complexity of the single individual snp haplotyping problem. *Algorithmica*, 49(1):13–36, 2007.

Refereed Conference Publications

[1] John Tromp. How to construct an atomic variable. In *LNCS 392, Proc. 3rd International Workshop On Distributed Algorithms*, pages 292–302. Springer, 1989.

[2] Avrim Blum, Tao Jiang, Ming Li, John Tromp, and Mihalis Yannakakis. Linear approximation of shortest superstrings. In *Proceedings of the 23rd Annual ACM Symposium on Theory of Computing, STOC'91 (New Orleans, Louisiana, May 6-8, 1991)*, pages 328–336, New York, 1991. ACM SIGACT, ACM Press.

[3] Yehuda Afek, Eli Gafni, John Tromp, and Paul Vitányi. Wait-free test-and-set. In *WDAG*, volume 647 of *Lecture Notes in Computer Science*, pages 85–94. Springer, 1992.

[4] Jaap-Henk Hoepman and John Tromp. Binary snapshots. In *LNCS 725, Proc. 7th International Workshop On Distributed Algorithms*, pages 18–25. Springer, 1993.

[5] John Tromp and Peter van Emde-Boas. Associative storage modification machines. In Klaus Ambos-Spies, Steven Homer, and Uwe Schöning, editors, *Complexity Theory*, pages 291–313. Cambridge University Press, 1993.

[6] John Tromp, Louxin Zhang, and Y. Zhao. Small weight bases for hamming codes. In *Proc. COCOON'95*, volume 959 of *Lecture Notes in Computer Science*, pages 235–243, 1995.

[7] Thomas Hancock, Tao Jiang, Ming Li, and John Tromp. Lower bounds on learning decision lists and trees (extended abstract). In *Proc. STACS'95*, volume 900 of *Lecture Notes in Computer Science*, pages 527–538, 1995.

[8] John Kececioglu, Ming Li, and John Tromp. Inferring a dna sequence from erroneous copies (abstract). In *ALT*, volume 997 of *Lecture Notes in Computer Science*, pages 151–152. Springer, 1995.

[9] Bhaskar DasGupta, Xin He, Tao Jiang, Ming Li, John Tromp, and Louxin Zhang. On distances between phylogenetic trees. In *Proc. 8th Annual ACM-SIAM Symposium on Discrete Algorithms*, pages 427–436, January 1997.

[10] Harry Buhrman, Matt Franklin, Juan Garay, Jaap-Henk Hoepman, John Tromp, and Paul Vitányi. Mutual search. In *Proc. 9th Annual ACM-SIAM Symposium On Discrete Algorithms*, pages 481–489. ACM, 1998.

[11] Marcel Crâşmaru and John Tromp. Ladders are pspace-complete. In *Proc. 2nd International Conference on Computers and Games*, pages 241–249. Springer, 2000.

[12] Péeter Gács, John Tromp, and Paul M. B. Vitányi. Towards an algorithmic statistics. In *ALT*, volume 1968 of *Lecture Notes in Computer Science*, pages 41–55. Springer, 2000.

[13] Kazuyuki Amano, John Tromp, Paul M. B. Vitányi, and Osamu Watanabe. On a generalized ruin problem. In *RANDOM-APPROX*, volume 2129 of *Lecture Notes in Computer Science*, pages 181–191. Springer, 2001.

[14] Harry Buhrman, John Tromp, and Paul Vitányi. Time and space bounds for reversible simulation. In *ICALP*, volume 2076 of *Lecture Notes in Computer Science*, pages 1017–1027. Springer, 2001.

[15] Ming Li, John Tromp, and Paul Vitányi. Sharpening occam's razor. In *COCOON*, volume 2387 of *Lecture Notes in Computer Science*, pages 411–419. Springer, 2002.

[16] John Tromp and Paul Vitányi. A protocol for randomized anonymous two-process wait-free test-and-set with finite-state verification. In *SIROCCO*, volume 13 of *Proceedings in Informatics*, pages 275–291. Carleton Scientific, 2002.

[17] Alex Lopez-Ortiz, Claude-Guy Quimper, John Tromp, and Peter van Beek. A fast and simple algorithm for bounds consistency of the alldifferent constraint. In *Proc. IJCAI-2003*, pages 245–250, August 2003.

[18] Rudi Cilibrasi, Leo van Iersel, Steven Kelk, and John Tromp. On the complexity of several haplotyping problems. In *WABI*, volume 3692 of *Lecture Notes in Computer Science*, pages 128–139. Springer, 2005.

[19] John Tromp and Gunnar Farnebäck. Combinatorics of go. In *Proc. 5th International Conference on Computers and Games*, pages 241–249. Springer, 2006.

Thesis

[1] John Tromp. *Aspects of Algorithms and Complexity.* PhD thesis, University of Amsterdam, 1993. `http://www.cwi.nl/~tromp/thesis.html`.

Other Publications

[1] John Tromp. More computations on gauss' lattice point problem. Technical Report CS-R9017, CWI, May 1990.

[2] Gloria Kissin and John Tromp. The energy complexity of threshold and other functions. Technical Report CS-R9101, CWI, January 1991.

[3] John Tromp and Paul Vitányi. Randomized wait-free test-and-set. Technical Report CS-R9113, CWI, June 1991.

[4] John Tromp (Ed.). A dynamic and quick intellect, November 1996. Liber Amicorum for Paul Vitányi, 25 years at CWI.

[5] John Tromp. Kolmogorov complexity in combinatory logic. Manuscript, CWI, Amsterdam, 1996.

[6] John Tromp and Rudi Cilibrasi. Limits of rush hour logic complexity. Manuscript, CWI, Amsterdam, 2004.

[7] John Tromp. Solving connect-4 on medium board sizes. *ICGA Journal*, 31(2):110–112, 2008.

[8] John Tromp. Binary lambda calculus and combinatory logic. In Cristian S. Calude, editor, *Randomness And Complexity, from Leibniz To Chaitin.* World Scientific Publishing Company, October 2008.

Book Contributions

Section 3.2 and various material to Ming Li, Paul Vitányi, "An Introduction to Kolmogorov Complexity and its Applications", Second Edition, Springer, 1997.

7 Lectures

Invited Talks

- October 8, 1990, University of Rochester, NY, USA, "Linear Approximation of Shortest Superstrings".
- October 16, 1990, University of Waterloo, Ontario, Canada, "Wait-Free Variables".
- May 7, 1991, New York University, NY, USA, "Linear Approximation of Shortest Superstrings".
- May 8, 1991, Princeton, NJ, USA, "Linear Approximation of Shortest Superstrings".

- May 18, 1992, Technion, Haifa, Israel, "Linear Approximation of Shortest Superstrings".
- May 26, 1992, Technion, Haifa, Israel, "On Labyrinth Problems and Flood-Filling".
- June 2, 1992, Technion, Haifa, Israel, "The energy complexity of threshold and other functions".
- June 8, 1992, Weizmann, Tel-Aviv, Israel, "Linear Approximation of Shortest Superstrings".
- September 26, 1994, University of Waterloo, Ontario, Canada, "DNA Sequencing and Multiple Alignments".
- December 22, 1997 NEC Research Institute, NJ, USA, "Mutual Search".
- January 17, 1998 University of Waterloo, Ontario, Canada, "Mutual Search".
- November 9, 2005, University of Waterloo, Canada, "Combinatorics of Go".
- March 23, 2006, University of Manitoba, Winnipeg, Canada, "Combinatorics of Go".
- April 5, 2006, Googleplex, Mountain View, CA, USA, "Combinatorics of Go".

Conference Talks

- 3rd International Workshop On Distributed Algorithms, September 1989, La Colle sur Loup, France, "How to Construct an Atomic Variable".
- 23rd annual ACM Symposiom on Theory of Computing (STOC91), May 1991, New Orleans, USA, "Linear Approximation of Shortest Superstrings".
- 12th annual Symposium on Theoretical Aspects of Computer Science (STACS95), March 1995, Münich, Gernmay, "Lower Bounds on Learning Decision Lists and Trees".
- 1st annual International Computing and Combinatorics Conference (COCOON95), August 1995, Xi'an, China, "Sharpening Occam's Razor".
- Ninth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA98), January 25-27, 1998, San Francisco, California, "Mutual Search".
- Third Workshop on Algorithmic Information Theory (TAI'99), May 20-21, 1999, LORIA Nancy, France, "Kolmogorov Complexity made Concrete".
- Fourth Workshop on Algorithmic Information Theory (TAI2000), June 8-9, 2000, Université de Lille, France, "Algorithmic Statistics".
- 2nd International Conference on Computers and Games, October 26-28, 2000, Hamamatsu, Japan. "Ladders are PSPACE-complete".
- Centennial Seminar on Kolmogorov Complexity and Applications, April 27-May 2, 2003, Dagstühl, Germany, "Algorithmic Probability and Plain Complexity".
- Kolmogorov Complexity and Applications January 29-February 3, 2006, Dagstühl, Germany, "Binary Lambda Calculus and Combinatory Logic".
- Gathering for Gardner 7, March 16-19, 2006, Atlanta, GA, USA, "Combinatorics of Go".
- 5th International Conference on Computers and Games, May 29-31, 2006, Turin, Italy, "Combinatorics of Go".

8 Professional Activities

Conference Organization

- EUROCRYPT 2005, installing and running web submission and review software.

Seminars

- Co-organizer of the bi-weekly CAG (Complexity, Algorithms, and Geometry) Seminar, at the CWI, during 1992–1993.

9 Students Supervised

- Łukasz Lew, M.Sc. Free University, Amsterdam, "Experiments in Monte-Carlo Go", September 2005 (co-supervised with Wojtek Kowalczyk).

10 Other Activities

Playing the game of Go, recumbent biking and rowbiking, kayaking, inline skating and hiking.