

Darko Stefanovic

Associate Professor
Department of Computer Science
University of New Mexico
Farris Engineering Center 345C
MSC01 1130
1 University of New Mexico
Albuquerque, NM 87131

(505) 277-6561
darko@cs.unm.edu
<http://www.cs.unm.edu/~darko>

April 2008

EDUCATION

Ph.D., Computer Science, University of Massachusetts Amherst, 1999. Thesis: *Properties of Age-Based Automatic Memory Reclamation Algorithms*.

M.S., Computer Science, University of Massachusetts Amherst, 1994. Thesis: *Generational Copying Garbage Collection for Standard ML: a quantitative study*.

Dipl. Ing., Electrical Engineering, University of Belgrade, 1989. Thesis: *Implementation of a language processor generator*.

EMPLOYMENT

2006 – present. Department of Computer Science, University of New Mexico. Associate Professor.

2000 – 2006. Department of Computer Science, University of New Mexico. Assistant Professor.

1998 – 2000. Department of Electrical Engineering, Princeton University. Post-doctoral Research Associate.

1993 – 1998. Department of Computer Science, University of Massachusetts Amherst. Research Assistant.

1992 – 1993. School of Computer Science, Carnegie Mellon University. Visiting Scholar.

1991 – 1992. Department of Computer Science, University of Massachusetts Amherst. Research Assistant.

1990 – 1991. Department of Computer and Information Science, University of Massachusetts Amherst. Teaching Assistant.

1985. Burroughs Corporation, Milano, Italy. *Sistemista*.

RESEARCH INTERESTS

Experimental computer science in the field of programming language implementation (Java virtual machines, garbage collection, security)

Practical molecular computation (biochemical modes of computation, microfluidics, molecular cybernetics)

TEACHING EXPERIENCE

Programming Languages, Operating Systems, Compilers

REFEREED JOURNAL PUBLICATIONS

- “A Rational Approach to Minimal High-Resolution Cross-Reactive Arrays”, by E. Green, M. J. Olah, T. Abramova, L. R. Williams, D. Stefanovic, and M. N. Stojanovic, *Journal of the American Chemical Society*, 128(47), 15278–15282 (2006).
- “Medium Scale Integration of Molecular Logic Gates in an Automaton”, by J. Macdonald, Y. Li, M. Sutovic, H. Lederman, K. Pendri, W. Lu, B. L. Andrews, D. Stefanovic, and M. N. Stojanovic, *Nano Letters*, 6(11), 2598–2603 (2006).
- “Behavior of Polycatalytic Assemblies in a Substrate-Displaying Matrix”, by R. Pei, S. K. Taylor, D. Stefanovic, S. Rudchenko, T. E. Mitchell, and M. N. Stojanovic, *Journal of the American Chemical Society*, 128(39), 12693–12699 (2006).
- “On the Prediction of Java Object Lifetimes”, by H. Inoue, D. Stefanovic, and S. Forrest, *IEEE Transactions on Computers*, 55(7), 880–892 (2006).
- “Generating Object Lifetime Traces with Merlin”, by M. Hertz, S. M. Blackburn, J. E. B. Moss, K. S. McKinley, and D. Stefanovic, *ACM Transactions on Programming Languages and Systems*, 28(3), 476–516 (2006).
- “Characterization of Transverse Channel Concentration Profiles Obtainable With a Class of Microfluidic Networks”, by J. Sager, M. Young, and D. Stefanovic, *Langmuir*, 22(9), 4452–4455 (2006).
- “Deoxyribozyme-Based Three-Input Logic Gates and Construction of a Molecular Full Adder”, by H. Lederman, J. Macdonald, D. Stefanovic, and M. N. Stojanovic, *Biochemistry*, 45(4), 1194–1199 (2006).
- “Randomized Instruction Set Emulation”, by E. G. Barrantes, D. H. Ackley, S. Forrest, and D. Stefanovic, *ACM Transactions on Information and System Security*, 8(1), 3–40 (2005).
- “Deoxyribozyme-Based Ligase Logic Gates and Their Initial Circuits”, by M. N. Stojanovic, S. Semova, D. Kolpashchikov, J. Macdonald, C. Morgan, and D. Stefanovic, *Journal of the American Chemical Society*, 127(19), 6914–6915 (2005).
- “A Deoxyribozyme-Based Molecular Automaton”, by M. N. Stojanovic and D. Stefanovic, *Nature Biotechnology*, 21, 1069–1074 (2003).
- “Deoxyribozyme-based Half-Adder”, by M. N. Stojanovic and D. Stefanovic, *Journal of the American Chemical Society*, 125(22), 6673–6676 (2003).
- “Implicit-OR tiling of Deoxyribozymes: Construction of Molecular Scale OR, NAND, and Four-Input Logic Gates”, by M. N. Stojanovic, D. B. Nikic, and D. Stefanovic, *Journal of the Serbian Chemical Society*, 68(4–5), 321–326 (2003).
- “Deoxyribozyme-Based Logic Gates”, by M. N. Stojanovic, T. E. Mitchell, and D. Stefanovic, *Journal of the American Chemical Society*, 124(14), 3555–3561 (2002).

BOOK CHAPTERS

- “Nanocomputing” by J. Sager, J. Farfel, and D. Stefanovic, Chapter 10 in “NanoBioTechnology: BioInspired Devices and Materials of the Future”, O. Shoseyov and I. Levy (eds.), Humana Press, 2007.
- “Computing with Nucleic Acids”, by M. N. Stojanovic, D. Stefanovic, Th. LaBean, and H. Yan, Chapter 14 in “Bioelectronics: From Theory to Applications”, I. Willner and E. Katz (eds.), Wiley-VCH, 2005.

“Solution-Phase Molecular-Scale Computation With Deoxyribozyme-Based Logic Gates and Fluorescent Readouts” by J. Macdonald, D. Stefanovic, and M. N. Stojanovic, Chapter 22 in “Fluorescent Energy Transfer Nucleic Acid Probes”, V. V. Didenko (ed.), Methods in Molecular Biology Series, Humana Press, 2006.

ENCYCLOPAEDIC ENTRIES

“Nucleic Acids from A to Z”, S. Müller (ed.), Wiley-VCH, 2008 (in press).

REFEREED CONFERENCE PUBLICATIONS

“Efficient Context-Sensitive Shape Analysis with Graph Based Heap Models”, by M. Marron, M. Hermenegildo, D. Stefanovic and D. Kapur, in *Compiler Construction*, Budapest, Hungary, April 2008.

“Heap Analysis in the Presence of Collection Libraries”, by M. Marron, D. Stefanovic, M. Hermenegildo, and D. Kapur, in *PASTE2007, 7th ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering*, San Diego, California, June 2007.

“Static Heap Analysis for Automatic Parallelization”, by M. Marron, D. Kapur, D. Stefanovic and M. Hermenegildo, in *LCPC 2006, The 19th International Workshop on Languages and Compilers for Parallel Computing*, New Orleans, Louisiana, November 2006, (Springer LNCS to appear).

“The DaCapo Benchmarks: Java Benchmarking Development and Analysis”, by S. M. Blackburn, R. Garner, C. Hoffman, A. Khan, K. S. McKinley, R. Bentzur, A. Diwan, D. Feinberg, S. Z. Guyer, A. Hosking, M. Jump, J. E. B. Moss, D. Stefanovic, T. VanDrunen, D. von Dincklage, and B. Wiedermann. in *Object-Oriented Programming Systems, Languages, and Applications*, Portland, Oregon, November 2006.

“Designing Nucleotide Sequences for Computation: A Survey of Constraints”, by J. Sager and D. Stefanovic, in *11th International Meeting on DNA Computing*, London, Ontario, Canada, June 2005. (Springer LNCS Vol. 3892)

“Towards practical biomolecular computers using microfluidic deoxyribozyme logic gate networks”, by J. Farfel and D. Stefanovic, in *11th International Meeting on DNA Computing*, London, Ontario, Canada, June 2005. (Springer LNCS Vol. 3892)

“Building the components for a biomolecular computer” by C. Morgan, D. Stefanovic, C. Moore, and M. N. Stojanovic, in *10th International Meeting on DNA Computing*, Milano, Italy, June 2004. (Springer LNCS Vol. 3384, 247–257)

“Design and Implementation of a 64 Bit PowerPC Port of Jikes RVM 2.0.3” by S. Kyrilkov, D. Stefanovic, and E. Moss, in *2nd Workshop on Managed Run-time Environments*, Palo Alto, CA, March 2004.

“Randomized instruction set emulation to disrupt binary code injection attacks”, by E. G. Barrantes, D. H. Ackley, S. Forrest, T. S. Palmer, D. Stefanovic, and D. Dai Zovi, in *10th ACM Conference on Computer and Communications Security*, Washington, DC, October, 2003.

“Model Checking Reconfigurable Processor Configurations for Safety Properties”, by J. Cochran, D. Kapur, and D. Stefanovic, in *FPL, 13th International Conference on Field Programmable Logic and Applications*, Lisbon, Portugal, September, 2003. (Springer LNCS Vol. 2778)

“Older-first Garbage Collection in Practice: Evaluation in a Java Virtual Machine”, by D. Stefanovic, M. Hertz, S. M. Blackburn, K. S. McKinley and J. E. B. Moss, in *ACM SIGPLAN Workshop on Memory System Performance*, Berlin, Germany, June 2002.

“Error-Free Garbage Collection Traces: How to Cheat and Not Get Caught”, by M. Hertz, S. Blackburn, J. E. B. Moss, K. S. McKinley, and D. Stefanovic, in *ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Systems*, Marina del Rey, California, June 2002.

“On Models for Object Lifetime Distributions”, by D. Stefanovic, K. S. McKinley, and J. E. B. Moss, in *ACM International Symposium on Memory Management*, Minneapolis, Minnesota, October 2000.

“Limits and Graph Structure of Available Instruction-Level Parallelism”, by D. Stefanovic and M. Martonosi, in *Euro-Par 2000, European Conference on Parallel Computing*, Munich, Germany, September 2000. (Springer LNCS Vol. 1900)

“On Availability of Bit-narrow Operations in General-purpose Applications”, by D. Stefanovic and M. Martonosi, in *FPL, 10th International Conference on Field Programmable Logic and Applications*, Villach, Austria, August 2000. (Springer LNCS Vol. 1896)

“Age-Based Garbage Collection”, by D. Stefanovic, K. S. McKinley, and J. E. B. Moss, in *Object-Oriented Programming Systems, Languages, and Applications*, Denver, Colorado, November 1999.

“Learning to Schedule Straight-Line Code”, by J. E. B. Moss, P. Utgoff, J. Cavazos, D. Precup, D. Stefanovic, C. Brodley, and D. Scheeff, in *Neural Information Processing Systems – Natural and Synthetic*, Denver, Colorado, December 1997.

“Characterisation of object behaviour in Standard ML of New Jersey”, by D. Stefanovic and J. E. B. Moss, in *Proceedings of the 1994 ACM Conference on Lisp and Functional Programming*, Orlando, Florida, June 1994.

“The Garbage Collection Toolkit as an Experimentation Tool”, in *Object-Oriented Programming Systems, Languages, and Applications Workshop on Memory Management and Garbage Collection*, Washington, DC, September 1993.

“A Comparative Performance Evaluation of Write Barrier Implementations”, by A. Hosking, J. E. B. Moss, and D. Stefanovic, in *Object-Oriented Programming Systems, Languages, and Applications*, Vancouver, British Columbia, October 1992.

CONFERENCE PRESENTATIONS

“A Study of Garbage Collection With a Large Address Space for Server Applications”, by S. Kyrylkov and D. Stefanovic, in *Programming Languages and Compilers*, Las Vegas, NV, June 2005.

“Randomized instruction set emulation to disrupt binary code injection attacks”, by E. G. Barrantes, D. H. Ackley, S. Forrest, and D. Stefanovic, in *Adaptive and Resilient Computer Security Workshop*, Santa Fe, NM, November 2004.

REFEREED CONFERENCE ABSTRACTS

“Reaction Simulations: A Rapid Development Framework”, by M. Calhoun-Lopez and D. Stefanovic, poster, *13th International Meeting on DNA Computing*, Memphis, Tennessee, June 2007

“Oligonucleotide-detecting automata for games and genome analysis”, by J. Macdonald, Y. Li, M. Sutovic, D. Stefanovic, and M. Stojanovic, poster, Consortium for Post Genome Science Conference 2006, Manchester, March 2006.

COURSES TAUGHT

Core undergraduate courses:

- CS 481 “Operating Systems Principles” (F2000)
- CS 451 “Programming Paradigms” (S2001, S2002, S2003, S2004, S2005, S2006, S2007, S2008)
- CS 351 “Design of Large Programs” (F2003, F2004)

Core graduate courses:

- CS 454/554 “Compiler Construction” (F2001)
- CS 555 “Advanced Topics in Compiler Construction” (F2002, F2007)

Graduate seminars:

- CS 491/591 “Java: The Language and its Efficient Implementation” (S2001)
- CS 491/591 “Memory Management” (F2001)
- CS 491/591 “Object-Oriented Language Implementation” (S2002)
- CS 491/591 “Code Generation and Optimization” (S2003)
- CS 491/591 “Advanced Object-Oriented Programming” (F2004)
- CS 491/591 “New Paradigms in Computing” (F2005)

DEPARTMENTAL SERVICE

- Graduate Admissions Committee, Chair, 2001–2006.
- Undergraduate Honors Committee, 2002–present.
- PhD Comprehensive Examination, Programming Languages Section examiner, 2000–present; coordinator 2002–present.
- MS examination examiner 2000–present; coordinator 2004–2006.
- Technical Reports series coordinator, 2005–2006.

UNIVERSITY SERVICE

- Faculty Senate Committee on Intellectual Property, 2001–2004.

PROFESSIONAL SERVICE

- Host, DaCapo PI meetings, January 2003 and January 2006.
- Host, Next Generation Virtual Machine meeting, January 2006.
- Member and director for cyberinfrastructure, Center for Molecular Cybernetics, an NSF Chemical Bonding Center.
- Panelist for National Science Foundation, CISE directorate.
- Occasional reviewer for Addison-Wesley, Morgan Kaufmann, John Wiley, etc.
- Participant (together with CS351 students) in class-testing the 2nd edition of Michael Scott’s *Programming Language Pragmatics*.

- Reviewer for journals: ACM Transactions on Computer Systems; ACM Transactions on Architecture and Compiler Optimizations; IEEE Transactions on Parallel and Distributed Systems; IEEE Transactions on Computers; Journal of the American Chemical Society; Nucleic Acids Research; BioSystems; Nano Letters; Science; Theoretical Computer Science.
- Reviewer for conferences: Architectural Support for Programming Languages and Operating Systems (ASPLoS); Object-Oriented Programming Systems, Languages, and Applications (OOPSLA); Programming Language Design and Implementation (PLDI); Parallel Architectures and Compilation Techniques (PACT); International Conference on Supercomputing (ICS); European Compiler Construction Conference; High Performance Computer Architectures (HPCA); International Symposium on Computer Architecture (ISCA); International Symposium on Performance Analysis of Systems and Software; International Symposium on Microarchitecture (MICRO); Workshop on Hot Topics in Operating Systems (HotOS).
- Conference program committees: BIC-TA 2007, 2nd annual conference on Bio-Inspired Computing: Theories and Applications, Zheng Zhou, China, Sep. 14-17 2007; BIC-TA 2008, Australia.

COMMUNITY SERVICE

- Albuquerque Public Schools' Career Enrichment Center.
- Maxwell Museum of Anthropology, Clark Field Library: book repair volunteer effort, since 2003.
- Magnifico Art Forward, Steering Committee, 2004.
- Intel International Science Fair, judge, 2007.

HONORS

- NSF CAREER Award, 2003.
- Junior Faculty Research Excellence Award, UNM School of Engineering, May 2004.
- Regents' Lecturer, UNM, November 2004.
- Bronze Medal, 14th International Physics Olympiad, 1983.