

Ekaterina A. Holdener (née Smorodkina)

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Research Interests

Development of novel parameterless Evolutionary Algorithms. Application of Evolutionary Algorithms to Natural Language Processing and to generating heuristics for NP-hard problems.

Education

Ph.D. in Computer Science
Missouri University of Science and Technology, Rolla, MO, May 2008
Dissertation advisor: Dr. Daniel Tauritz
Dissertation title: The Art of Parameterless Evolutionary Algorithms
4.0/4.0 GPA

M.S. in Computer Science
University of Missouri-Rolla, Rolla, MO, December 2005
Thesis title: Numerical and parametrical analysis of higher order material models
4.0/4.0 GPA

B.S. in Computer Science & B.A. in Mathematics
Truman State University, Kirksville, MO, August 2003
3.83/4.0 GPA

Teaching Experience

Graduate Teaching Assistant
Computer Science Department January 2004 - May 2005
Missouri University of Science and Technology August 2007 - May 2008
Job responsibilities included teaching "Introduction to Programming C++" lecture course, designing and grading tests and assignments, holding office hours.

Research Experience

Dissertation Research August 2005 - May 2008
Advisor: Dr. Daniel Tauritz Missouri University of Science and Technology
Developed methods and algorithms for automating and optimizing parameter configuration of Evolutionary Algorithms (EAs). Among the developed methods are: 1) Greedy Population Sizing - a method for determining and appropriate population size for an EA, 2) Learning Offspring Optimizing Mate Selection and its variant Estimated Learning Offspring Optimizing mate selection - for automating the mate selection process of an EA, 3) Self-Adaptive Semi-Autonomous Parent Selection - for automating the parent selection stage of an EA, and 4) hybridization of these methods.

Graduate Research Assistantship 2005–2007
Computer Science Department
University of Missouri-Rolla
Researched fortification of the power grid with Flexible AC Transmission Systems (FACTS) devices as a member of the "Power Group" research laboratory. Implemented an efficient method for calculating the power flow through the grid to be used by the group. Developed a new technique for making the recalculation of the power flow through the grid more efficient. Analyzed the shape of the function suggested for controlling FACTS devices.

Masters Thesis Research

Advisor: Dr. Michael Hilgers

Applied Finite Element Method to cloth modeling in computer graphics.

2003–2005

University of Missouri - Rolla

Industry Experience

Hardware Verification Engineer

June 2008 - Present

Exegy, Inc

St. Louis, MO USA

My current responsibilities include leading verification process of all hardware devices, maintenance and development of verification tools, assisting software and hardware integration planning and implementation, facilitation of a smooth transition of the hardware to the Quality Assurance team.

Software Programmer Intern

May 2001 - August 2001

May 2002 - August 2002

May 2003 - August 2003

Enterprise Rent-A-Car

St. Louis, MO USA

Participated in the development, implementation, and testing of a new web-based reservation and tracking system for internal company use. Worked in a team-based environment.

Honors and Awards

04/2008: Missouri University of Science and Technology Department of Computer Science Outstanding Graduate Teaching Assistant Award

09/2007: Grace Hopper Conference attendance full scholarship recipient

04/2007: Computer Science Leadership Award, University of Missouri - Rolla

04/2004, 04/2005, 04/2006, 04/2007, 04/2008: University of Missouri - Rolla Department of Computer Science Academic Achievement Award

01/2006: Google Workshop for Women Engineers participant

10/2005: University of Missouri Rolla campus nominee for Midwestern Association of Graduate Schools (MAGS) Distinguished Master's Thesis Award

04/2003: Truman State University Computer Science Department Honors

04/2003 - Present: Phi Beta Kappa academic honor society member

Refereed Conference Papers

1. **E. Holdener** and Daniel R. Tauritz. Learning Offspring Optimizing Mate Selection. In *Proceedings of GECCO 2008 - the Genetic and Evolutionary Computation Conference*, pages 1109–1110, Atlanta, Georgia, U.S.A. , July 12-16, 2008 (two-page poster abstract).
2. **E. Smorodkina** and D. Tauritz. Toward automating EA configuration: the parent selection stage. In *Proceedings of CEC 2007: IEEE Congress on Evolutionary Computation*, pages 63-70. Singapore, September 25-28, 2007.
3. **E. Smorodkina** and D. Tauritz. Greedy population sizing for evolutionary algorithms. In *Proceedings of CEC 2007: IEEE Congress on Evolutionary Computation*, pages 2181-2187. Singapore, September 25-28, 2007.
4. **E. Smorodkina**, M. Thakur, and D. Tauritz. Algorithms for the balanced edge partitioning problem. In *Proceedings of WEA 2007 - the 6th Workshop on Experimental Algorithms*, pages 311-323, Rome, Italy, June 6-9, 2007.
5. **E. Smorodkina** and D. Tauritz. Power grid protection through rapid response control of FACTS devices. In *Proceedings of the International Workshop on Complex Network and Infrastructure Protection - CNIP 2006*, pages 441-450, Rome, Italy, March 28-29, 2006.

Journal Papers under Revision

1. **E. Holdener** and D. Tauritz. Greedy population sizing evolutionary algorithm. Under revision for the *MIT Press' Evolutionary Computation*.
2. **E. Holdener**, M. Thakur, and D. Tauritz. Algorithms for the balanced edge partitioning problem. Under revision for the *ACM Journal of Experimental Algorithmics*.

Journal Papers in Review

1. **E. Smorodkina**, M. Hilgers, and D. Tauritz. Stable finite element method for cloth modeling. In review by *Springer's Engineering with Computers*.

Research Presentations

12/11/2007 "Parameterless Evolutionary Algorithms", invited talk at the Department of Computer and Information Sciences of Southwest Baptist University, Bolivar, Missouri, USA.

10/17/2007 "Toward Parameterless Evolutionary Algorithms" poster presentation. Grace Hopper Conference 2007, Orlando, Florida, USA.

06/08/2007 "Algorithms for the Balanced Edge Partitioning Problem", University of Rome "La Sapienza", Rome, Italy. (Presented paper [3] from Refereed Conference Papers section at the Workshop on Experimental Algorithms 2007.)

02/08/2007 "Self-Adaptive Semi-Autonomous Parent Selection", Computer Science Department colloquium at the University of Missouri-Rolla, Rolla, Missouri, USA.

Academic Activities

Undergraduate Research Supervision: supervised and mentored undergraduate students conducting research. The students, and their project details are listed in Table 1.

Name	Support	Project Description	Academic Year
Ashley Lang	MRO-W	Indoor Air Quality Simulator	2007-2008
Janet Guntly	MRO-W	Indoor Air Quality Simulator	2007-2008
Joshua Eads	OURE Fellow	Deriving Gas-Phase Exposure History through Computationally Evolved Inverse Diffusion Analysis	2007-2008
Joshua Eads	OURE	Multi-Agent Modeling of Cooperative Distributed Flow-Control Devices for Transport Network Applications	2006-2007

Table 1: Undergraduate research supervision

Service

- 04/2008: Served on the Technical Program Committee for the 2008 IEEE World Congress on Computational Intelligence
- 04/2007: Served on the International Program Committee for the 2007 IEEE Congress on Evolutionary Computation

Leadership

- 11/3/2007: ACM International Collegiate Programming Contest Mid-Central region site judge, University of Missouri-Rolla, Rolla, Missouri, USA
- 10/2007 - 11/2007: Assistant coach for the UMR ACM-W programming team, in preparation for the ACM International Collegiate Programming Contest, University of Missouri-Rolla, Rolla, Missouri, USA

- 08/2007 - 05/2008: President of the Missouri S & T chapter of ACM-W (ACM’s Committee on Women in Computing), Missouri University of Science and Technology, Rolla, Missouri, USA
- 08/2006 - 08/2007: Vice President of the UMR chapter of ACM-W (ACM’s Committee on Women in Computing), University of Missouri-Rolla, Rolla, Missouri, USA
- 08/2001 - 05/2003: One of the founders and a member of Truman Women in Computer Science (TWICS) at Truman State University, Kirksville, Missouri, USA

Professional Development

- 10/2007 Attended *Clear Writing. Successful Proposals* workshop, sponsored by the office of graduate studies at the University of Missouri-Rolla, Rolla, Missouri, USA
- 01/2004 Attended Graduate Teaching Assistant (GTA) workshop at the University of Missouri-Rolla, Rolla, Missouri, USA

Contributions to Grant Writing

- “Gas-Phase Exposure History Derived From Material-Phase Concentration Profiles”, \$591,041, 8/1/2006-7/31/2009, submitted to NSF
- “Deriving gas-phase exposure histories from material-phase concentration profile”, \$614,669, 5/1/2007-4/30/2010, submitted to NSF

Professional Affiliations

Association for Computing Machinery: <http://www.acm.org/>

ACM’s Committee on Women in Computing at University of Missouri-Rolla:
<http://web.mst.edu/~acmw/>

References

Dr. Daniel Tauritz	Associate Professor
Dissertation advisor	Department of Computer Science
Email: dtauritz AT acm DOT org	Missouri University of Science and Technology
Phone: (573) 341-7218	Rolla, Missouri, USA

Clayton Price	Instructor
Introduction to Programming C++ course coordinator	Department of Computer Science
Email: price AT mst DOT edu	Missouri University of Science and Technology
Phone: (573) 341-4620	Rolla, Missouri, USA

Dr. Mayur Thakur	Software Engineer
Co-author	Google, Inc
Email: mayurthakur AT google DOT com	Mountain View, California, USA
Phone: (650) 214-5163	