

Sergey Blagodurov

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Professional experience:

2013 – **MTS**

present Advanced Micro Devices (AMD) Research – *Seattle, WA*
I work on [FastForward](#) team with [Gabriel Loh](#). We are re-designing systems for Exascale era. The coverage of the project spans many IT news websites worldwide, such as [DatacenterDynamics](#), [HPCwire](#), [eWeek](#), [Street Insider](#), and [The Verge](#).

2010 – 2013 **Research Associate**

Hewlett-Packard Laboratories – *Calgary, AB, Canada*
Under the careful guidance of [Martin Arlitt](#) and [Daniel Gmach](#), I worked on a few projects:
3. [Net-Zero Energy Data Center](#) which has made headlines at [InfoWorld](#), [ZDNet](#), [Silicon Republic](#), [Information Management](#), [The Register](#), [Tech Week](#), among many others.
2. Designing Smart Meter Data Assurance in HPE's Vertica DB, with Tableau visualization.
1. [Improving the Efficiency of Information Collection and Analysis in Widely Used IT Applications](#), now is [part](#) of [the Bro Network Security Monitor](#).

2008 – 2010 **Research Fellow**

Simon Fraser University – *Vancouver, BC, Canada*
Created [Clavis](#) and [ClavisMO](#), experimental job schedulers for Linux and Hadoop (C/C++).

2006 – 2008 **Software developer**

The Federal Financial Monitoring Service of Russia – *Moscow, Russia*
Developed a system for large-scale text recognition in ABBYY FlexiCapture.

2004 – 2006 **Web developer**

ArtXGroup Company – *Moscow, Russia*
Developed a web-based content management system in C#, PHP, and MySQL.

Education:

2008 – 2013 **PhD in Computer Science**

Advisor: [Alexandra \(Sasha\) Fedorova](#)
Simon Fraser University – *Vancouver, BC, Canada*
Thesis: [Addressing shared resource contention in datacenter servers](#)
Selected for the Dissertation showcase at SuperComputing 2013.
Thesis summary:

Servers are major energy consumers in datacenters. Much of that energy is wasted because programs compete for shared resources and suffer severe performance penalties due to resource contention. My Thesis addresses the contention problem.

GPA: 4.05 (out of 4.33)

2002 – 2008 **MSc with Honors in Computer Engineering**

Moscow Engineering Physics Institute (State University) – *Moscow, Russia*
GPA: 5.00 (out of 5.00)

Peer-reviewed scientific publications:

Google Scholar citation index: [2028](#).

- [P16] Amro Awad, Arkaprava Basu, Sergey Blagodurov, Yan Solihin, Gabriel Loh, [Avoiding TLB Shootdowns through Self-invalidating TLB Entries](#), in *International Conference on Parallel Architectures and Compilation Techniques (PACT)*, 2017. Acceptance rate 23%.
- [P15] Amro Awad, Sergey Blagodurov, Yan Solihin, [Write-Aware Management of NVM-based Memory Extensions](#), in *International Conference on Supercomputing (ICS)*, 2016. Acceptance rate 24%.
- [P14] Sergey Blagodurov, Alexandra Fedorova, Evgeny Vinnik, Tyler Dwyer, and Fabien Hermenier, [Multi-Objective Job Placement in Clusters](#), in *SuperComputing Conference (SC)*, 2015. Acceptance rate 22%.
- [P13] Mitesh Meswani, Sergey Blagodurov, David Roberts, John Slice, Mike Ignatowski, Gabriel Loh, [Heterogeneous Memory Architectures: A HW/SW Approach for Mixing Die-stacked and Off-package Memories](#), in *IEEE International Symposium on High Performance Computer Architecture (HPCA)*, 2015. Acceptance rate 23%. **Selected as a Best Paper Nominee.**
- [P12] Sergey Blagodurov, Daniel Gmach, Martin Arlitt, Yuan Chen, Chris Hyser, Alexandra Fedorova, [Maximizing Server Utilization while Meeting Critical SLAs via Weight-Based Collocation Management](#), in *IFIP/IEEE Integrated Network Management Symposium (IM)*, 2013. Acceptance rate 27%. **This work is part of HP's Net-Zero Energy Data Center architecture, which was named a 2013 Computerworld Honors Laureate.**
- [P11] Martin Arlitt, Cullen Bash, Sergey Blagodurov, Yuan Chen, Tom Christian, Daniel Gmach, Chris Hyser, Niru Kumari, Zhenhua Liu, Manish Marwah, Alan McReynolds, Chandrakant Patel, Amip Shah, Zhikui Wang, Rongliang Zhou, [Towards the Design and Operation of Net-Zero Energy Data Centers](#), in *InterSociety Thermal Conference (ITherm)*, 2012.
- [P10] Tyler Dwyer, Alexandra Fedorova, Sergey Blagodurov, Mark Roth, Fabien Gaud, and Jian Pei, [A Practical Method for Estimating Performance Degradation on Multicore Processors and its Application to HPC Workloads](#), in *SuperComputing Conference (SC)*, 2012. Acceptance rate 21%.
- [P9] Sergey Zhuravlev, Juan Carlos Saez, Sergey Blagodurov, Alexandra Fedorova, and Manuel Prieto, [Survey of Energy-Cognizant Scheduling Techniques](#), in *Transactions on Parallel and Distributed Systems (TPDS)*, 24(7), pp. 1447-1464. July 2013. Impact Factor: 2.8.
- [P8] Sergey Blagodurov, Sergey Zhuravlev, Mohammad Dashti, and Alexandra Fedorova, [A Case for NUMA-aware Contention Management on Multicore Systems](#), in *USENIX Annual Technical Conference (USENIX)*, 2011. Acceptance rate 15%.
- [P7] Sergey Zhuravlev, Juan Carlos Saez, Sergey Blagodurov, Alexandra Fedorova, and Manuel Prieto, [Survey of Scheduling Techniques for Addressing Shared Resources in Multicore Processors](#), in *ACM Computing Surveys (CSUR)*, vol. 45, issue 1 (Article 4), November 2012. Impact Factor: 7.6.
- [P6] Sergey Blagodurov, Sergey Zhuravlev, and Alexandra Fedorova, [Contention Aware Scheduling on Multicore Systems](#), in *ACM Transactions on Computer Systems (ACM TOCS)*, vol. 30, issue 4, December 2010. Impact Factor: 2.3.
- [P5] Sergey Zhuravlev, Sergey Blagodurov, and Alexandra Fedorova, [AKULA: A Toolset for Developing Scheduling Algorithms on Multicore Systems](#), in *International Conference on Parallel Architectures and Compilation Techniques (PACT)*, 2010. Acceptance rate 17%.

- [P4] Juan Carlos Sáez Alcaide, Manuel Prieto Matias, Alexandra Fedorova, Sergey Blagodurov, [A Comprehensive Scheduler for Asymmetric Multicore Systems](#), in *ACM European Conference on Computer Systems (EuroSys)*, 2010. Acceptance rate 19%.
- [P3] Alexandra Fedorova, Sergey Blagodurov, and Sergey Zhuravlev, [Managing Contention for Shared Resources on Multicore Processors](#), Invited to *Communications of the ACM (CACM)*, vol 53, issue 2, February 2010. Impact Factor: 2.3.
- [P2] Sergey Zhuravlev*, Sergey Blagodurov,* and Alexandra Fedorova, [Addressing Shared Resource Contention in Multicore Processors via Scheduling](#), in *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2010. Acceptance rate 17%.
*A coin toss decided the order of the first two authors.
- [P1] Daniel Shelepov, Juan Carlos Saez, Stacey Jeffery, Alexandra Fedorova, Nestor Perez, Zhi Feng Huang, Sergey Blagodurov, Viren Kumar, [HASS: A Scheduler for Heterogeneous Multicore Systems](#), in *ACM Operating Systems Review (SIGOPS)*, vol. 43, issue 2, April 2009. Impact Factor: 2.5.

Peer-reviewed industrial experience publications:

- [I3] Martin Arlitt, Cullen Bash, Sergey Blagodurov, Yuan Chen, Tom Christian, Daniel Gmach, Chris Hyser, Niru Kumari, Zhenhua Liu, Manish Marwah, Alan McReynolds, Chandrakant Patel, Amip Shah, Zhikui Wang, The Net-Zero Energy Data Center, in *HP Annual Technical Conference (HP TECHCON)*, 2012. Acceptance rate < 10%.
- [I2] Sergey Blagodurov and Alexandra Fedorova, [User-level scheduling on NUMA multicore systems under Linux](#), in *Ottawa Linux Symposium (OLS)*, 2011.
- [I1] Sergey Blagodurov and Martin Arlitt, [Improving the efficiency of information collection and analysis in widely-used IT applications](#), in *ACM/SPEC Conference on Performance Engineering (ICPE)*, Industrial Applications and Experience track 2011.

Patents (granted only):

- [A4] S. Blagodurov, A. Kegel, **Scheduling of Data Migration**, granted: [US9594521](#).
- [A3] D. Gmach, S. Blagodurov, M. Arlitt, Y. Chen, C. Hyser, **Weight-Based Collocation Management**, granted: [US9178763](#).
- [A2] S. Blagodurov, M. Arlitt, D. Gmach, C. Hyser, C. Bash, **Maximizing Server Utilization within a Data Center**, granted: [US9104498](#).
- [A1] C. Bash, M. Arlitt, S. Blagodurov, Y. Chen, T. Christian, D. Gmach, C. Hyser, N. Kumari, Z. Liu, M. Marwah, A. McReynolds, A. Shah, Z. Wang, C. Patel, **Managing a Facility**, granted: [CN103959190B](#).

Public software releases:

- [R3] [ClavisMO](#): a multi-objective virtualized scheduling framework for MapReduce and HPC clusters. The source code is available for download from [github repository](#).
- [R2] [Clavis](#): a contention-aware scheduler for multicore processors.
- [R1] A DataSeries logging module of [the Bro Network Security Monitor version 2.1](#).

Professional certification completed:

- [C3] Oracle PL/SQL Developer Certified Associate
- [C2] ABBYY FormReader Enterprise 6.5 Certified Administrator
- [C1] ABBYY FlexiCapture Certified Programmer

Service:

- [S2] Membership chair of the [IEEE Computer Society's STC on Sustainable Computing](#):
- Developed and successfully executed plan to reach 400 unique members by the end of 2012.
 - Created automated membership tracking (the [source](#) is on GitHub), [visualized it with Tableau](#).
- [S1] Expert reviewer for SPEC Distinguished Dissertation Award '17, MASCOTS '17, ACM TAAS '17, ACM TOPC '16, '15, '14, Euro-Par '15, IEEE CompArch Letters '15, IEEE TC '14, ACM TOMPECS '14, IEEE TPDS '13 and '11, Springer Transactions on CS '11, PPOPP '11, PACT '10.

Volunteering:

Mustard Seed, The Center for Wooden Boats

Hobbies:

Competitive dragon boating

References:

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