Natural Sciences and Engineering Research Council of Canada | Conseil de recherches en sciences naturelles et en génie du Canada

FORM 100
Personal Data Form
PART I

Date: 2013/06/12

Family name	Given name	Initial(s) of all given names	Personal identification no. (PIN)
Fedorova	Alexandra	A	**Valid** 319990

☐ I hold a faculty position at an eligible Canadian college (complete Appendices B1 and C)

☐ I do not or will not hold an academic appointment at a Canadian postsecondary institution

Place of employment other than a Canadian postsecondary Institution (give address in Appendix A)

APPOINTMENT AT A POSTSECONDARY INSTITUTION

Title of position: Associate Professor

Department:

Campus:

Canadian postsecondary institution:

Tenured or tenure-track academic appointment — Yes [X] No [ ]

Part-time appointment [ ] Full-time appointment [X]

- For all non-tenured or non tenure-track academic appointment and Emeritus Professors, complete Appendices B & C
- For life-time Emeritus Professor and part-time positions, complete Appendix C

ACADEMIC BACKGROUND

Degree	Name of discipline	Institution	Country	Date yyyy/mm
Bachelor's	Computer Science and Economics	Smith College	UNITED STATES	1999 / 05
Master's	Computer Science	Harvard University	UNITED STATES	2002 / 06
Doctorate	Computer Science	Harvard University	UNITED STATES	2006 / 11

TRAINING OF HIGHLY QUALIFIED PERSONNEL

Indicate the number of students, fellows and other research personnel that you:

	Currently		Over the past six years (excluding the current year)		
	Supervised	**Co-supervised**	**Supervised**	**Co-supervised**	**Total**
Undergraduate			16		16
Master's	3		9	1	13
Doctoral	3	1		1	5
Postdoctoral	1				1
Others					
Total	7	1	25	2	35

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ACADEMIC, RESEARCH AND INDUSTRIAL EXPERIENCE (use one additional page if necessary)

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Associate Professor	Simon Fraser	Computing Science, School of	2006/12
Teaching Assistant for "Advanced Operating Systems"	Harvard University	Computer Science	2005/09 to 2006/01
Graduate Research Intern	Sun Microsystems Incorporated	Laboratory	2003/07 to 2006/11
Teaching Assistant for "Operating Systems"	Harvard University	Computer Science	2003/01 to 2003/05
Teaching Assistant for "Operating Systems"	Harvard University	Computer Science	2002/01 to 2002/05
Research Assistant	Harvard University	Computer Science	2000/09 to 2006/11
Software Engineer	EMC Corporation		1999/06 to 2000/05
Instructor	Smith College		1999/01 to 1999/01
Research Assistant	Smith College	Computer Science	1998/06 to 1998/09

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RESEARCH SUPPORT

Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
List all sources of support **(including NSERC grants and university start-up funds)** held as an applicant or a co-applicant: a) support held in the past four (4) years but now completed; b) support currently held, and c) support applied for. For group grants, indicate the percentage of the funding directly applicable to your research. Use additional pages as required.			
a) Support held in the past 4 years			
Alexandra Fedorova	N/A Simon Fraser University Start-up Grant 5 hours/month	60,000	2006
Alexandra Fedorova	Use of Operating System Scheduling for Enhanced Performance and Usability of Chip Multiprocessing Systems NSERC Discovery Grant 10 hours/month	19,500 19,500 19,500 19,500 19,500	2007 2008 2009 2010 2011
Alexandra Fedorova	Sun Microsystems Incorporated Research Grant 10 hours/month	8,500 61,530	2007 2008
Alexandra Fedorova	Operating System Scheduling for Heterogeneous Multicore Systems NSERC Strategic Grant Supplemental Competition 40 hours/month	70,875 71,800	2008 2009

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a) Support held in the past 4 years			
Alexandra Fedorova	Virtual machine scheduling on multicore processors in data centers Google Google Research Awards 10 hours/month	40,000(100%)	2009
Alexandra Fedorova	Design, Implementation and Evaluation of the Prototype for Power Management in Data Centers MITACS MITACS Accelerate Internship 7 hours/month	15,000(100%)	2010
Alexandra Fedorova	Cost-effective mapping of video games to a multi-processor system-on-a-chip platform NSERC and STMicroelectronics Engage 10 hours/month	23,147	2011
b) Support currently held			
Alexandra Fedorova	Sun Microsystems Canada Research grant 5 hours/month	36,000 36,000 36,000	2009 2010 2011

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b) Support currently held			
Lesley Shannon, Alexandra Fedorova	A Configurable Profiling Core for Multicore Processors NSERC Strategic Project Grant 15 hours/month	88,163 (36%) 80,400 (40%) 80,400 (40%)	2009 2010 2011
Alexandra Fedorova	Tools and Techniques for Parallelization of Video Game Engines NRAS NRAS Research Team Program 15 hours/month	72,886 (88%) 72,886 (88%) 72,886 (88%) 72,886	2010 2011 2012 2013
Alexandra Fedorova	Sun Microsystems Canada Research grant 5 hours/month	22,500 22,500 22,500 22,500	2010 2011 2012 2013
Alexandra Fedorova	GRAND NCE: Graphics, animation and new media NSERC NCE 20 hours/month	63,000 42,000 35,000	2010 2011 2012

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b) Support currently held			
Alexandra Fedorova	Efficient Scheduling on Mobile Multicore Platforms RIM 40 hours/month	26,000 (65%) 26,000 (65%)	2011 2012
Alexandra Fedorova	Reducing the Cost of Accessing Memory on NUMA Systems Oracle 15 hours/month	68,750 67,500	2011 2012
Alexandra Fedorova	GREEN-SOFT: Adaptive software runtime for energy-efficient multi-core computing. (Pending IP agreement). NSERC and STMicroelectronics CRD 12 hours/month	38,775 (50%) 38,775 (50%) 38,775 (50%)	2012 2013 2014
c) Support applied for			
Alexandra Fedorova	Eliminating energy waste in memory systems by improving the software NSERC Discovery grant 35 hours/month	60,697 60,697 60,697 60,697 60,697	2012 2013 2014 2015 2016

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c) Support applied for			
Arrvindh Shriraman	Amoeba Cluster: Compute Cluster for Computer Architecture and Systems Research at Simon Fraser NSERC RTI 40 hours/month	72,428 (27%)	2012

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Highly Qualified Personnel (HQP)

Provide personal data about the HQP that you currently, or over the past six years, have supervised or co-supervised.

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Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Jessica Jiang	Master's (In Progress)	Supervised 2012 -	Not yet determined	student
Craig Mustard	Master's (In Progress)	Supervised 2011 -	not yet proposed	student
Evgeny Vinnik	Doctoral (In Progress)	Supervised 2011 -	not yet determined	student
Svetozar Miucin	Doctoral (In Progress)	Supervised 2011 -	not yet determined	student
Justin Funston	Doctoral (In Progress)	Supervised 2010 -	not yet proposed	student
Mohammad Dashti	Master's (In Progress)	Supervised 2010 -	not yet determined	student
Micah J Best	Doctoral (In Progress)	Co-supervised 2008 -	Data-informed scheduling	student
Sergey Blagodurov	Doctoral (In Progress)	Supervised 2008 -	not yet proposed	student
Doucette, Daniel	Master's (In Progress)	Supervised 2007 -	not yet proposed	student
Fabien Gaud	Postdoctoral (Completed)	Supervised 2011 - 2012	Memory management on NUMA systems	post-doc
Mark Roth	Master's (Completed)	Supervised 2010 - 2012	Deconstructing parallel performance	software engineer
Tyler Dwyer	Master's (Completed)	Supervised 2010 - 2012	A Practical Method for Estimating Performance Degradation...	research assistant
Carlos Luque	visiting Ph.D. (In Progress)	Supervised 2011 - 2011	Hardware support for scheduling and its application	visiting student at SFU
Elliot Rushton	Undergraduate (Completed)	Supervised 2011 - 2011	Techniques for memory migration on NUMA systems	software engineer at Avigilon
Jessica Jiang	Undergraduate (Completed)	Supervised 2011 - 2011	Data replication for reducing interconnect congestion	student
Parsiad Azimzadeh	Undergraduate (Completed)	Supervised 2011 - 2011	not applicable	student at University of Waterloo
Pascal Schoenhardt	Undergraduate (Completed)	Supervised 2011 - 2011	Techniques for memory migration on NUMA systems	software engineer at Amazon
Sergey Zhuravlev	Master's (Completed)	Supervised 2009 - 2011	Contention-aware scheduling for multicore processors	software engineer at Teradici
Shane Mottishaw	Master's (Completed)	Supervised 2009 - 2011	Synchronization via Scheduling	software engineer at Corensic
Ananth Narayan	Master's (Completed)	Supervised 2008 - 2011	Power management in data centers	software engineer at Intel (India)

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Highly Qualified Personnel (HQP)

Provide personal data about the HQP that you currently, or over the past six years, have supervised or co-supervised.

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Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Craig Mustard	Res. Associate (Completed)	Supervised 2008 - 2011	Cascade parallel programming environment	graduate student at SFU
Nasser Ghazali	Master's (Completed)	Supervised 2008 - 2011	A Power Model For Multicore Processor Systems	Software enginner at InfoMine
Juan Carlos Saez	Doctoral (Completed)	Co-supervised 2007 - 2011	Scheduling for performance-asymmetric systems	Assistant Professor at Complutense University, Madrid
Ben Reilly	Undergraduate (Completed)	Supervised 2001 - 2011	ABACUS: A reconfigurable profiler for multicore systems	student at University of Toronto
Ali Kamali	Master's (Completed)	Supervised 2008 - 2010	Sharing-aware scheduling on multicore systems	software engineer at Avigilon
Eric Matthews	Master's (Completed)	Co-supervised 2008 - 2010	ABACUS: A reconfigurable profiler for multicore systems	student
Sergey Zhuravlev	Res. Associate (Completed)	Supervised 2009 - 2009	NSERC USRA: Modelling contention on multicore processors	software engineer at Teradici
Viren Kumar	Master's (Completed)	Supervised 2008 - 2009	VIRENTRACK: A HEURISTIC FOR REDUCING CACHE	Software developer at SAP
Vahid Kazempour	Master's (Completed)	Supervised 2007 - 2009	AASH: ASYMMETRY-AWARE SCHEDULER FOR	software developer at QuIC Financial (Calgary)
Aron Brown	Res. Associate (Completed)	Supervised 2008 - 2008	NSERC USRA: parallelization of video game engines	Software Engineer I, Electronic Arts
Daniel Shelepov	Res. Associate (Completed)	Supervised 2008 - 2008	NSERC USRA. Scheduling on het. multicore systems	Software Engineer, Microsoft
Stacey Jeffery	Res. Associate (Completed)	Supervised 2008 - 2008	CDMP+NSERC USRA program. Scheduling for heterogeneous syst.	student
James Lang	Res. Associate (Completed)	Supervised 2007 - 2008	NSERC USRA	unknown
Shane Mottishaw	Res. Associate (Completed)	Supervised 2007 - 2008	NSERC USRA	student
Daryl Hawkins	Res. Associate (Completed)	Supervised 2007 - 2007	Evaluation of dCache performance on Niagara systems	Software Engineer, Microsoft

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1 Most Significant Contributions to Research

My most significant research contributions are in improving efficiency of multicore processors and memory systems with software methods. When systems run inefficiently they waste energy. Our algorithms ensure that resources are used efficiently and energy waste is minimized. In the past 6 years we published over 30 papers in top systems conferences (such as ASPLOS, PLDI, EuroSys, USENIX ATC) and journals (ACM TOCS, TPDS, CACM). These venues have very low acceptance rates (e.g., 18.6% for ASPLOS 2010) and follow a rigorous blind review process. Over the past 6 years I have trained 40 HQP (graduate and undergraduate). In 2011 I was a recipient of the Anita Borg Early Career award, and in 2012 I was a recipient of the Alfred P. Sloan Fellowship.

Managing Resource Contention in Multicore Processors

Resource contention in a serious problem preventing efficient use of multicore processors. When threads running simultaneously compete for shared resources, such as last-level caches, memory interconnects, pre-fetching hardware and others, they slow each other down and lose efficiency. My group focuses on managing contention for resources using software methods. Software methods can be used on existing systems and be adapted sooner than solutions requiring changes to the hardware. We developed several scheduling algorithms that dynamically and online identify threads that compete for shared resources and schedule these threads so as to avoid contention. We observed performance improvements of up to 35% relative to the default Linux OS scheduler. We are working with Oracle to implement our algorithm in their operating system Solaris. Related publications are: [7, 8, 9, 14, 16, 10, 21, 29].

Operating System Support for Asymmetric Multicore Systems

Asymmetric single-ISA multicore processors are becoming increasingly common; the first production asymmetric processor was announced by ARM in 2011. To fully tap into their potential, the operating system scheduler needs to be asymmetry-aware, so it can match instruction streams (threads) to cores, such that each thread runs on the core best suited for its needs. My research group was among the first to implement a family of asymmetry-aware algorithms in a real operating system and on real hardware. We observed efficiency improvements of as much as 50%, relative to conventional OS schedulers. Related publications are: [6, 13, 17, 19, 23, 27, 36, 38].

Synchronization via Scheduling

This work features a novel way to increase efficiency of parallel programming and has specific application to games, augmented reality, computer vision and other new media applications. A major cause of errors and programmer frustration is parallel data access conflicts. Ensuring protection to shared data is a tremendous manual effort. We proposed a new technique, Synchronization via Scheduling (SvS), that analyzes the program code to automatically discover the values accessed by each of its tasks. SvS then assigns to run in parallel those tasks that do not access shared data; all other tasks are serialized. SvS significantly reduces execution time of parallel video game programs without requiring the programmer to think about shared state conflicts, thus increasing programmer productivity. Related publications are: [11][25][31][32].

2 Research Contributions and Practical Applications

Journals and Conference Proceedings

[1] **Mark Roth**, **Micah J Best**, **Craig Mustard** and Alexandra Fedorova, Deconstructing the Overhead in Parallel Applications, *IEEE International Symposium on Workload Characterization* (IISWC), 2012. – Funding by GRAND NCE and BCIC Research Team grant.

[2] **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, *Supercomputing Conference (SC),* 2012. – Funding by NSERC Discovery grant, BCIC Research team grant, and Oracle.

[3] **Mohammad Hosseini**, Alexandra Fedorova, Joseph Peters, Shervin Shirmohammadi, Energy-Aware Adaptations in Mobile 3D Graphics, *ACM Multimedia,* 2012.

[4] **Eric Matthews**, Lesley Shannon and Alexandra Fedorova, From One to Many, Bringing MicroBlaze into the Multicore Era with Linux SMP Support, *22nd International Conference on Field Programmable Logic and Applications (FPL),* 2012. – Funding by NSERC Strategic Grant

[5] **Justin Funston**, Kaoutar El Maghraoui, Joefon Jann, Pratap Pattnaik and Alexandra Fedorova, An SMT-Selection Metric to Improve Multithreaded Applications' Performance, *IEEE International Parallel & Distributed Processing Symposium (IPDPS)*, 2012

[6] **J. Saez**, Manuel Prieto, A. Fedorova, D. Koufaty, Leveraging Core Specialization via OS Scheduling To Improve Performance On Asymmetric Multicore Systems, *ACM Transactions on Computer Systems (TOCS)*, vol. 30, issue 2, April 2012

[7] **S. Zhuravlev, J. Saez**, **S. Blagodurov**, A. Fedorova**,** M. Prieto, Survey of Energy-Cognizant Scheduling Techniques, *accepted to Transactions on Parallel and Distributed Systems (TPDS)*.

[8] **S. Zhuravlev, J. Saez**, **S. Blagodurov**, A. Fedorova**,** M. Prieto, Survey of Scheduling Techniques for Addressing Shared Resources in Multicore Processors, *to appear in ACM Computing Surveys (CSUR)*, vol 45, issue 1, March 2013.

[9] **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. -- Funding by NSERC Discovery Grant and Sun Microsystems

[10] **Kishore Kumar**, David Vengerov, Alexandra Fedorova and Vana Kalogeraki, FACT: a Framework for Adaptive Contention-Aware Thread Migrations, *ACM International Conference on Computing Frontiers (CF'11)* – Funding by Oracle

[11] **Micah J Best, Shane Mottishaw, Craig Mustard, Mark Roth**, Alexandra Fedorova, Andrew Brownsword, Synchronization via Scheduling: Techniques For Efficiently Managing Shared State in Video Games, *32nd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'11)* – Funding by NSERC NCE and BCIC

[12] **Ananth Narayan S, Somshubra Sharangi**, Alexandra Fedorova, Global Cost-Diversity Aware Dispatch Algorithm for Heterogeneous Data Centers, *2nd ACM/SPEC Conference on Performance Engineering (ICPE'11)*, 2011 – Funding by NSERC MITACS and Google

[13] **Juan Carlos Saez, Daniel Shelepov**, Alexandra Fedorova and Manuel Prieto, Leveraging Workload Diversity through OS Scheduling to Maximize Performance on Single-ISA Heterogeneous Multicore Systems, *Journal of Parallel and Distributed Computing*, vol. 71, issue 1, January 2011 *)* – Funding by NSERC Strategic Project Grant

[14] **Sergey Blagodurov**, **Sergey Zhuravlev** and Alexandra Fedorova, Contention Aware Scheduling on Multicore Systems, in *ACM Transactions on Computer Systems*, vol. 28, issue 4, December 2010 -- Funding by NSERC Discovery Grant and Sun Microsystems

[15] **Eric Matthews**, Lesley Shannon and Alexandra Fedorova, A Configurable Framework for Investigating Workload Execution, in *International Conference on Field-Programmable Technology (FPT)*, 2010 – Funding by NSERC Strategic Project Grant

[16] **Sergey Zhuravlev, Sergey Blagodurov** and Alexandra Fedorova, AKULA: A Toolset for Experimenting and Developing Thread Placement Algorithms on Multicore Systems, *19th Intenrational Conference on Parallel Architectures and Compilation Techniques (PACT) 2010* – Funding by NSERC Discovery Grant and Sun Microsystems

[17] **Juan Carlos Saez**, Alexandra Fedorova, Manuel Prieto and **Hugo Vegas**, Operating System Support for Mitigating Software Scalability Bottlenecks on Asymmetric Multicore Processors.

ACM International Conference on Computing Frontiers (CF'10) – Funding by NSERC Strategic Project Grant

[18] **Vahid Kazempour**, **Ali Kamali** and Alexandra Fedorova, AASH: An Asymmetry-Aware Scheduler for Hypervisors. *ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE '10)* – Funding by NSERC Strategic Project Grant

[19] **Juan Carlos Saez**, Manuel Prieto, Alexandra Fedorova and **Sergey Blagodurov**, A Comprehensive Scheduler for Asymmetric Multicore Processors, *5th ACM European Conference on Computer Systems (EuroSys 2010)* – Funding by NSERC Strategic Project Grant

[20] Alexandra Fedorova, **Sergey Blagodurov** and **Sergey Zhuravlev**, Managing Contention for Shared Resources on Multicore Processors. *Communications of the ACM (CACM)*, *vol 53, no 2, pp. 49-57*. February 2010.

[21] **Sergey Zhuravlev, Sergey Blagodurov,** and Alexandra Fedorova. Addressing Cache Contention in Multicore Processors via Scheduling, *Fifteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2010

[22] **Walter Maldonado, Patrick Marlier,** Pascal Felber, **Adi Suissa**, Danny Hendler, Alexandra Fedorova, Julia Lawall, Gilles Muller, Scheduling Support for Transactional Memory Contention Management. *15th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP),* 2010

[23] Alexandra Fedorova, **Juan Carlos Saez, Daniel Shelepov** and Manuel Prieto, Maximizing Performance per Watt with Asymmetric Multicore Systems. *Communications of the ACM (CACM)* vol. 52, no. 12, pp. 48-57. December 2009 – Funding by NSERC Strategic Project Grant

[24] **James Charles, Preet Jassi, Ananth Narayan S, Abbas Sadat** and Alexandra Fedorova, Evaluation of the Intel Core i7 Turbo Boost Feature. *IEEE International Symposium on Workload Characterization (IISWC)*, October 2009

[25] **M. J Best**, A. Fedorova, **R. Dickie, A. Tagliasacchi, A. Couture-Beil, C. Mustard, S. Mottishaw, As Brown, Z. F. Huang, X. Xu, N. Ghazali** and A. Brownsword, Searching for Concurrent Design Patterns in Video Games: Practical lessons in achieving parallelism in a video game engine. *Euro-Par Conference 2009* – Funding by NSERC Discovery Grant

[26] **V. Kumar** and A. Fedorova, Towards Better Performance Per Watt in Virtual Environments on Asymmetric Single-ISA Multi-core Systems. In *Operating Systems Review, vol. 43, issue 3*, July 2009 – Funding by NSERC Strategic Project Grant

[27] **D. Shelepov, J. C. Saez, S. Jeffery**, A. Fedorova, **N. Perez, Z. F. Huang, S. Blagodurov, V. Kumar**, HASS: A Scheduler for Heterogeneous Multicore Systems. In *ACM Operating Systems Review 43(2)*, *pp. 66-75,* April 2009 – Funding by NSERC Strategic Project Grant

[28] **V. Kazempour**, A. Fedorova, and **P. Alagheband**, Performance Implications of Cache Affinity on Multicore Processors. *Euro-Par Conference 2008* – Funding by NSERC Strategic Project Grant

[29] A. Fedorova, M. Seltzer and M. Smith, Improving Performance Isolation on Chip Multiprocessors via an Operating System Scheduler. *16th Conference on Parallel Architectures and Compilation Techniques (PACT)*, 2007

[30] P. Damron, A. Fedorova, Y. Lev, V. Luchangco, M. Moir and D. Nussbaum. Hybid Transactional Memory. In *11th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2006

Refereed workshop proceedings

[31] **Micah J Best, Shane Mottishaw, Craig Mustard, Mark Roth, Parsiad Azimzadeh**, Alexandra Fedorova, Andrew Brownsword, Schedule Data Not Code, *Third USENIX Workshop on Hot Topics on Parallelism (HotPar 11)* – Funding by NSERC NCE and BCIC

[32] **Micah J Best, Shane Mottishaw, Craig Mustard, Mark Roth**, Alexandra Fedorova and Andrew Brownsword, Synchronization via Scheduling: Managing Shared State in Video Games,

in *Second USENIX Workshop on Hot Topics on Parallelism (HotPar 10)* – Funding by NSERC NCE

[33] **Jon Hourd, Chaofei Fan, Jiasi Zeng, Qiang (Scott) Zhang, Micah J Best**, Alexandra Fedorova and **Craig Mustard**, Exploring Practical Benefits of Asymmetric Multicore Processors, *2009 Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures* – Funding by NSERC Strategic Project Grant

[34] **Kishore Kumar Pusukuri**, David Vengerov, and Alexandra Fedorova, A Methodology for Developing Simple and Robust Power Models Using Performance Monitoring Events, in *Workshop on the Interaction between Operating Systems and Computer Architecture,* 2009

[35] **B. Chen, W. P. T. Ma, Y. Tan,** A. Fedorova and G. Mori, GreenRT: A Framework for the Design of Power-Aware Soft Real-Time Applications. *Workshop on the Interaction between Operating Systems and Computer Architecture*, 2008 – Funding by NSERC Strategic Project Grant

[36] **D. Shelepov** and A. Fedorova, Scheduling on Heterogeneous Multicore Processors Using Architectural Signatures. *Workshop on the Interaction between Operating Systems and Computer Architecture*, 2008 – Funding by NSERC Strategic Project Grant

[37] **A. Tagliasacchi, R. Dickie, A. Couture-Beil, M. J Best**, A. Fedorova, and A. Brownsword, Cascade: A Parallel Programming Framework for Video Game Engines. *Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures (PESPMA)*, 2008 – Funding by NSERC Strategic Grant and Sun Microsystems

[38] A. Fedorova, **V. Kumar, V. Kazempour, S. Ray, and P. Alagheband**, Cypress: A Scheduling Infrastructure for a Many-Core Hypervisor. *Workshop on Managed Multi-Core Systems (MMCS), 2008* – Funding by NSERC Strategic Grant and Sun Microsystems

[39] A. Fedorova, D. Vengerov and **D. Doucette**, Operating System Scheduling on Heterogeneous Core Systems. *First Workshop on Operating System Support for Heterogeneous Multicore Architectures*, 2007 – Funding by NSERC Strategic Project Grant and Sun Microsystems

[40] **S. Bachthaler, F. Belli** and A. Fedorova. Desktop Workload Suitability for CMP/SMT and Implications for Operating System Design, *Workshop on the Interaction between Operating Systems and Computer Architecture,* 2007 – Funding by Sun Microsystems and NSERC Discovery Grant

[41] **D. Doucette** and A. Fedorova. Base Vectors: A Potential Technique for Microarchitectural Classification of Applications, *Workshop on the Interaction between Operating Systems and Computer Architecture (WIOSCA),* 2007 – Funding by NSERC Discovery Grant and Sun Microsystems

[42] A. Fedorova, M. Seltzer and M. Smith. A Non-Work-Conserving Operating System Scheduler for SMT Processors. *Workshop on the Interaction between the Operating Systems and Computer Architecture (WIOSCA)*, 2006

3 Other Evidence of Impact and Contributions

Awards

- **Sloan Fellowship** (2012) – Alfred P. Sloan Fellowships are awarded to young scientists in natural science and engineering in recognition of their contributions to research.
- **Anita Borg Early Career Award** (2011) – this award is given by ACM to women in the early stage of their careers for contributions to research and community outreach.

Selected Invited Talks

- Multicore Software Systems Research Challenges, CRA-W workshop on Multicore Systems for women and minorities, co-located with ASPLOS 2011

- Appeared on Intel Parallel Programming Talk, Managing Contention for the Shared Resources on Multicore Processors, August 10, 2010
- Joys of Scheduling on Large Multicore Systems, Google. April 2010
- Unleashing the Potential of AMP Systems with OS Support, Cornell University, AMD Computer Engineering Lecture Series, April 2009
- How I Got into the OS Research and Why I Decided to Stay, PLOSA Workshop at ASPLOS 2009
- How to Make the Most out of Graduate School, Diversity Workshop at OSDI 2008
- HASS: A Scheduler for Heterogeneous Multicore Systems, Intel, Google, Sun Microsystems, HP Labs, Stanford, UC Berkeley, Fall 2008
- How to Make the Most out of Graduate School, Srivastava Graduate Student Workshop, UBC, 2008
- System Software Design for Chip Multithreaded Processors, UBC, March 1, 2007.
- Cache-fair Scheduling for Chip Multithreaded Processors, VMWare, San Jose, September 1, 2006.
- Operating System Scheduling for Multicore Processors, Intel, Santa Clara, May 11, 2006.
- Operating System Methods for Improved Resource Sharing on Chip Multiprocessors, Harvard Industrial Partnership Symposium, October 21, 2005.

Conference Technical Program Committees (PC)

- Conferences: USENIX 2012, VEE 2012, ASPLOS 2012, USENIX 2011, EuroSys 2011, PPoPP 2011, HiPEAC 2011, PACT 2010, EuroSys 2010, ASPLOS 2009, SPAA 2008.
- Workshops: HotOS 2013, HotPar 2009-2012, WIOSCA 2010, PESPMA 2010, PESPMA 2009, WIOSCA 2009, MMCS 2008, WIOSCA 2008, WIOSCA 2007.

Other:

- USENIX board of directors
- PC Co-chair for the First USENIX Workshop on Hot Topics in Parallelism (HotPar'09)
- Steering committee for First USENIX Workshop on Hot Topics in Parallelism

4 Delays in Research Activity

None

5 Contribution to the Training of Highly Qualified Personnel (HQP)

I currently supervising 3 M.Sc., 3 Ph.D. students, 1 postdoc and 2 undergraduates. Since my arrival to SFU six years ago I have supervised over 25 HQP, and graduated 9 M.Sc. students and 1 (co-supervised) Ph.D. student. Every one of my graduated students contributed to at least one publication, usually as first authors. They published in prestigious conferences, like ASPLOS, USENIX, PLDI, PACT, VEE and PPoPP and in top journals. My students are involved in all aspects of research, from conception of ideas, to implementation and writing.

After graduation, my students find themselves in high demand on the Canadian and US job market. Half of my graduated Master's students found jobs in Canadian companies (Avigilon, Teradici, SAP-Vancouver, Amazon-Vancouver, Electronic Arts-Vancouver, QuicFinancial, InfoMine), others went to US to work for Intel and Microsoft. Many of the undergraduate students whom I trained went on to graduate schools (UWaterloo, UofT, UBC, SFU). My Ph.D. students who are still in training are regularly solicited for summer internships at Oracle IBM, and HP. The Ph.D. student who graduated under my guidance obtained a faculty position at Complutense University in Madrid.

Natural Sciences and Engineering Research Council of Canada | Conseil de recherches en sciences naturelles et en génie du Canada

SEND ONE ORIGINAL ONLY DO NOT PHOTOCOPY

APPENDIX A
Personal Data
(Form 100)

Complete this appendix (i) if you are an applicant or co-applicant applying for the first time; (ii) if you need to update information submitted with a previous application; or (iii) if you do not hold an appointment at a Canadian postsecondary institution. For updates, include only the revised information in addition to the date, your name and your PIN.

This information will be used by NSERC primarily to contact applicants and award holders. It may also be used to identify prospective reviewers and committee members, and to generate statistics. It will not be seen or used in the adjudication process.

Date: 2013/06/12

Family name	Given name	Initial(s) of all given names	Personal identification no. (PIN)
Fedorova	Alexandra	A	**Valid** 319990

Position and complete mailing address if your primary place of employment is not a Canadian postsecondary institution or if your current mailing address is temporary

School of Computing Science
8888 University Drive
Burnaby BC V5A1S6
CANADA

If address is temporary, indicate:

Starting date

Leaving date

Telephone number	Facsimile number	E-mail address
(778) 7826904	(778) 7823045	fedorova@cs.sfu.ca

Telephone number (alternate)

Give an alternate telephone number only if you can be reached at that number during business hours.

Gender (completion optional): [ ] Male [X] Female

LANGUAGE CAPABILITY

English	Read [X]	Write [X]	Speak [X]
French	Read [X]	Write [X]	Speak [X]

I wish to receive my correspondence: in English [X] in French [ ]

AREA(S) OF EXPERTISE

Provide a maximum of 10 key words that describe your area(s) of expertise. Use commas to separate them. If you have expertise with particular instruments and techniques, specify which one(s).

operating systems, chip multiprocessors, multi-core processor architectures, parallel computing, operating system scheduling, cache modeling, analytical performance modeling, performance evaluation, file systems, transactional memory

Research subject code(s)

Primary: 2702

Secondary: 2720

Canada

Appendix D (Form 100)
Consent to Provide Limited Personal Information About Highly Qualified Personnel (HQP) to NSERC

NSERC applicants are required to describe their contributions to the training or supervision of highly qualified personnel (HQP) by providing certain details about the individuals they have trained or supervised during the six years prior to their current application. HQP information must be entered on the Personal Data Form (Form 100). This information includes the trainee's name, type of HQP training (e.g., undergraduate, master's, technical etc.) and status (completed, in-progress, incomplete), years supervised or co-supervised, title of the project or thesis, and the individual's present position.

Based on the federal *Privacy Act* rules governing the collection of personal information, applicants are asked to obtain consent from the individuals they have supervised before providing personal data about them to NSERC. In seeking this consent, the NSERC applicant must inform these individuals what data will be supplied, and assure them that it will only be used by NSERC for the purpose of assessing the applicant's contribution to HQP training. To reduce seeking consent for multiple applications, applicants will only need to seek consent one time for a six-year period. If the trainee provides consent by e-mail, the response must include confirmation that they have read and agree to the text of the consent form.

When consent cannot be obtained, applicants are asked to not provide names, or other combinations of data, that would identify those supervised. However, they may still provide the type of HQP training and status, years supervised or co-supervised, a general description of the project or thesis, and a general indication of the individual's present position if known.

An example of entering HQP information on Form 100 (with and without consent):

Name	Type of HQP Training and Status	Years Supervised or Co-supervised	Title of Project or Thesis	Present Position
Consent Received from Marie Roy				
Roy, Marie	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry in petroleum engineering	V-P (Research), Earth Analytics Inc., Calgary, Alberta
Consent Not Obtained from Marie Roy				
(name withheld)	Undergraduate (Completed)	Supervised 1994 - 1997	Isotope geochemistry	research executive in petroleum industry - western Canada

Consent Form

Name of Trainee

Applicant Information

Name: Fedorova, Alexandra A

Department	Postsecondary Institution
Computing Science, School of	Simon Fraser

I hereby allow the above-named applicant to include limited personal data about me in grant applications submitted for consideration to NSERC for the next six years. This limited data will only include my name, type of HQP training and status, years supervised or co-supervised, title of the project or thesis and, to the best of the applicant's knowledge, my position title and company or organization at the time the application is submitted. I understand that NSERC will protect this data in accordance with the *Privacy Act*, and that it will only be used in processes that assess the applicant's contributions to the training of highly qualified personnel (HQP), including confidential peer review.

Trainee's signature _____ Date _____

Note: This form must be retained by the applicant and made available to NSERC upon request.