H. Andrés Lagar-Cavilla

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EDUCATION

Ph.D. in Computer Science, **University of Toronto**, Canada
January 2005 – August 2009. GPA 4.0/4.0
Advisor: Prof. Eyal de Lara
Thesis: Flexible Computing with Virtual Machines.

M.Sc. in Computer Science, **University of Toronto**, Canada
September 2003 – December 2004. GPA 4.0/4.0
Advisor: Prof. Eyal de Lara
Thesis: Robustness of Simplified Simulation Models for Indoor MANET Evaluation.

B.A.Sc. Computer Systems Engineering, **Universidad Nacional del Sur**, Argentina
February 1998 – February 2003
GPA 10/10 – Highest program and university historical GPA.

PROFESSIONAL

Gridcentric Inc. – Co-Founder and Senior Staff Scientist
April 2009 to December 2009, and October 2011 to Present
GridCentric is a technology startup in Toronto, ON, Canada.

AT&T Labs Research -- Senior Member of Technical Staff
January 2010 – October 2011
Industrial research lab with a focus on networking and computer systems.

Visiting Researcher, Carnegie Mellon University
May 2005 – October 2005
Worked with Prof. M. Satyanarayanan's group in topics related to VM migration.

University of Toronto – Teaching Assistant
See **Teaching** section.

Universidad Nacional del Sur, Argentina – Teaching Assistant
See **Teaching** section.

RESEARCH INTERESTS

- **Cloud Computing:** I have developed crucial novel mechanisms in the space of cloud scalability, and continue to expand my interests in the area with a focus on wide area fault-tolerance and performance.
- **Virtualization:** Through my PhD work I have contributed to security, performance, and usability aspects of the state-of-the-art of virtualization, and I intend to strengthen my position as a figure in the field.
- **Storage**: I research storage performance and reliability aspects in two applications: disaster recovery of cloud VMs, and high-volume analytics on streaming data warehouses.
- **Mobile Devices**: I focus on the challenges arising from the power constraints of mobile devices, particularly in the context of security and UMTS network utilization.
- **High Performance Computing**: I am an experimental scientist with a strong focus on all aspects of high-performance computing workloads such as cluster, financial, bioinformatics, and web server applications.
- **Security**: I research security and privacy as services provided by thin software layers such as a hypervisor, with primary applications to cloud infrastructure and mobile devices.
- **End-User Performance**: I have researched the interplay between remote or thin client user experience and local or thick client interaction, with an emphasis on seamless transitions and hardware acceleration.
- **Network Simulation**: In the past I have studied and characterized the fidelity of widely used propagation and mobility models employed in mobile multihop wireless ad hoc network simulations.

PUBLICATIONS

Conference

Jettison: Efficient Idle Desktop Consolidation with Partial VM Migration
Nilton Bila, Eya de Lara, Kaustubh Joshi, H. Andrés Lagar-Cavilla, Matti Hiltunen and M. Satyanarayanan
Eurosys 2012: ACM European Conference in Computer Systems. Acceptance rate: 15%

PipeCloud: Using Causality to Overcome Speed-of-Light Delays in Cloud-Based Disaster Recovery
Timothy Wood, H. Andrés Lagar-Cavilla, K. K. Ramakrishnan, Prashant Shenoy, and Jacobus van der Merwe
SOCC 2011: Symposium on Cloud Computing. Acceptance rate 17%

Energy/Security Tradeoffs in Host-Based Mobile Malware Detection
Jeffrey Bickford, H. Andrés Lagar-Cavilla, Alexander Varshavsky, Vinod Ganapathy, and Liviu Iftode
Mobisys 2011:Conference on Mobile Systems, Applications, and Services. Acceptance rate 18%

Kaleidoscope: Cloud Micro-Elasticity via VM State Coloring
Roy Bryant, Alexey Tumanov, Olga Irzak, Adin Scannell, Kaustubh Joshi, Matti Hiltunen, H. Andrés Lagar-Cavilla, and Eyal de Lara
Eurosys 2011: ACM European Conference in Computer Systems. Acceptance rate: 15%

SnowFlock: Rapid Virtual Machine Cloning for Cloud Computing
H. Andrés Lagar-Cavilla, Joseph A. Whitney, Adin Scannell, Stephen M. Rumble, Philip Patchin, Eyal de Lara, Michael Brudno and M. Satyanarayanan
Best paper award in **Eurosys 2009**: ACM European Conference in Computer Systems. Acceptance rate: 17%.

Hypervisor Support for Identifying Covertly Executing Binaries
Lionel Litty, H. Andrés Lagar-Cavilla and David Lie
Usenix Security 2008. Acceptance rate: 16%.

Interactive Resource-Intensive Applications Made Easy
H. Andrés Lagar-Cavilla, Niraj Tolia, Eyal de Lara, M. Satyanarayanan and David O'Hallaron
Middleware 2007: ACM/IFIP/USENIX International Middleware Conference. Acceptance rate: 20%.

VMM-Independent Graphics Acceleration
H. Andrés Lagar-Cavilla, Niraj Tolia, Eyal de Lara and M. Satyanarayanan
VEE 2007: Virtual Execution Environments. Acceptance rate: 26%.

Simplified Simulation Models for Indoor MANET Evaluation Are Not Robust
H. Andrés Lagar-Cavilla, Gerard Baron, Tom Hart, Lionel Litty and Eyal de Lara
SECON 2004: Sensor and Ad Hoc Communications and Networks. Acceptance rate: 18%.

Hermes: Fine Granularity Software DSM
H. Andrés Lagar-Cavilla and Rafael B. García
CACIC 2003: IX Argentinian Conference on Computer Science, Argentina.

Journal

SnowFlock: Virtual Machine Cloning as a First Class Cloud Primitive
H. Andrés Lagar-Cavilla, Joseph. A. Whitney, Roy Bryant, Philip Patchin, Michael Brudno, Eyal de Lara, Stephen M. Rumble, M. Satyanarayanan and Adin Scannell
ACM Transactions in Computer Systems. February 2011, volume 29, issue 1.

On the Robustness of Simple Indoor MANET Simulation Models
H. Andrés Lagar-Cavilla, Gerard Baron, Tom Hart, Lionel Litty and Eyal de Lara,
Ad Hoc & Sensor Wireless Networks, volume 4, number 4, 2007.

Pervasive Personal Computing in an Internet Suspend/Resume System
M. Satyanarayanan, Benjamin Gilbert, Niraj Tolia, H. Andrés Lagar-Cavilla, Ajay Surie, Partho Nath, Adam Wolbach, Matt Toups, Michael A. Kozuch, Casey Helfrich, David O'Hallaron, Adrian Perrig, and David Farber
IEEE Internet Computing, March 2007.

Workshop

Traffic Backfilling: Subsidizing Lunch for Delay-Tolerant Applications in UMTS Networks
H. Andrés Lagar-Cavilla, Kaustubh Joshi, Alexander Varshavsky, Jeffrey Bickford, and Darwin Parra
Mobiheld 2011: Workshop on Networking, Systems, and Applications on Mobile Handhelds.

The Case for Energy-Oriented Partial Desktop Migration
Nilton Bila, Eyal de Lara, Matti Hiltunen, Kaustubh Joshi, H. Andrés Lagar-Cavilla, and M. Satyanarayanan
Hot Cloud 2010: Workshop on Hot Topics in Cloud Computing

Towards a Ubiquitous Cloud Computing Infrastructure
Jacobus van der Merwe, K.K. Ramakrishnan, Michael Fairchild, Ashley Flavel, Joe Houle, H. Andrés Lagar-Cavilla and John Mulligan
LANMAN 2010: Workshop on Local and Metropolitan Area Networks

Computer Meteorology: Monitoring Compute Clouds
Lionel Litty, H. Andrés Lagar-Cavilla, and David Lie
HotOS 2009: Workshop on Hot Topics in Operating Systems

Adding the Easy Button to the Cloud with SnowFlock and MPI
Philip Patchin, H. Andrés Lagar-Cavilla, Eyal de Lara and Michael Brudno
HPC Virt2009: Workshop on System-level Virtualization for High Performance Computing.

Low-Bandwidth VM Migration via Opportunistic Replay
Ajay Surie, H. Andrés Lagar-Cavilla, Eyal de Lara and M. Satyanarayanan
HotMobile 2008: Workshop on Mobile Computing, Systems and Applications. Acceptance rate: 23%

Book Chapters

The Architecture of Open Source Applications
Chapter "SnowFlock", Roy Bryant and H. Andrés Lagar-Cavilla. Amy Brown and Greg Wilson (editors)
Lulu.com, 2011, 978-1-257-63801-7 http://www.aosabook.org/en/index.html

Posters and Work-in-Progress

Wide Area as a Service
Poster at **Eurosys 2010**: ACM European Conference in Computer Systems

Five Minutes of Rage with SnowFlock
Work-In-Progress at **OSDI 2008**: Operating Systems Design and Implementation

SnowFlock: VM Cloning for Parallel Cloud Computing
Poster at the **Usenix Annual Technical Conference 2008**

Dimorphic Computing: Sustainable Performance Through Thick and Thin
Poster and Work-In-Progress at **Mobisys 2006**: Mobile Systems, Applications and Services

INVITED TALKS

I have also presented all conference papers I have been the first author of at the corresponding venue.

SnowFlock: Cloud Computing Made Agile
Systems Design and Implementation, Lectures in Computer Science Seminar, **Intel Research Pittsburgh** and Carnegie Mellon University. Pittsburgh, PA, June 2008.

SnowFlock: Cloud Computing Made Agile
Xen Summit Summer 2008. Boston, MA, June 2008.

Snowbird: Interactive Resource-Intensive Applications Made Easy
Systems Design and Implementation, Lectures in Computer Science Seminar, **Carnegie Mellon University**. Pittsburgh, PA, September 2007.

VMGL: VMM-Independent Graphics Acceleration
Xen Summit Spring 2007. Yorktown Heights, NY, April 2007.

Varying Client Thickness for Interactive Scientific Applications
Pittsburgh Supercomputing Center. Pittsburgh, PA, December 2005

HONORS AND AWARDS

NSERC Doctoral Prize
May 2010. Award Value: 10K CAD
NSERC (National Sciences and Engineering Research Council) is the Canadian analogous to the NSF. Granted yearly to two recipients among all Canadian PhD graduates in all engineering and computer science disciplines.

Best Paper Award – Eurosys 2009
Eurosys is a premier top-tier conference in computer systems research. It is ranked 11th by CiteSeer in terms of impact factor across all disciplines in computer science. The paper was unanimously chosen among over 150 submissions and 25 acceptances.

Canada Graduate Scholarship – Doctoral
May 2006 – April 2009. Award value: 35K CAD/year
Top scholarship granted by NSERC. Awarded to 2% of all applicants.

Ontario Graduate Scholarship
Offered on April 2006, declined in favor of NSERC CGS-D. Award value: 25K CAD/year
Province of Ontario

Wolfond Scholarship in Wireless Information Technology
September 2003 – August 2004. Award value: 25K CAD/year
Computer Science, University of Toronto. Granted to top first-year graduate students

Province of Buenos Aires Award, Argentina
Award granted to the highest graduating GPA of the year 2003 in all disciplines in the province

Excellence in Education Award, City Council, Bahía Blanca, Argentina
Award granted to the highest graduating GPA of the year 2003 in all disciplines in the city

25 de Mayo Award, Universidad Nacional del Sur, Argentina
Award granted to the highest graduating GPA of the year 2003 in all disciplines in the university

TEACHING and MENTORING

Teaching Assistant, Department of Computer Science, University of Toronto
September 2003 – August 2009

- CSC 209: Software Tools and Systems Programming
- CSC 207: Software Design
- CSC 369: Operating Systems
- CSC 258: Computer Organization – Laboratory
- CSC 458: Computer Networks
- CSC 2228: Topics in Mobile and Pervasive Computing (graduate-level class)

Mentor, AT&T Labs Research
May 2010 – Present
Mentor to summer interns Jeffrey Bickford, Yoshihisa Abe and Shakeel Butt.

Mentor, Department of Computer Science, University of Toronto.
May 2008 – August 2009
I supervised two undergraduate students during research scholarships of four and twelve months respectively.

Tutor, January 2005 – May 2005, Toronto, Canada
I assisted a student with special needs during the course of an undergraduate class.

Teaching Assistant, Computer Science, Universidad Nacional del Sur, Argentina
September 2001 – July 2003: Computer Organization, Computer Architecture and Operating Systems

SERVICE

External Reviewer

- IBM Journal of Research and Development, 2011
- Eurosys 2011, European Conference in Computer Systems
- HotMobile 2011, Workshop on Mobile Computing Systems and Applications
- IEEE Pervasive Computing Journal, 2011
- Springer Journal on Distributed Computing, 2010
- ACM Operating Systems Review Journal, 2010
- Grace Hopper Celebration for Women in Computer Science candidate review, 2010
- Wiley Software Practice and Experience Journal, 2010
- IEEE Transactions on Parallel and Distributed Systems Journal, 2010
- Eurosys 2009, European Conference in Computer Systems
- HotMobile 2009, Workshop on Mobile Computing Systems and Applications
- Ubicomp 2007, Conference on Ubiquitous Computing
- International Journal on Intelligent Control Systems, 2006
- Mobisys 2006, Conference on Mobile Systems, Applications and Services
- Elsevier Ad Hoc Networks Journal, 2006
- Ubicomp 2006, Conference on Ubiquitous Computing