

# H. Andrés Lagar-Cavilla

Email: [andres@lagarcavilla.org](mailto:andres@lagarcavilla.org)  
Web: <http://lagarcavilla.org>

Phone: (647) 778-4380

## EDUCATION

### **Ph.D.** in Computer Science, **University of Toronto**, Canada

January 2005 – August 2009. GPA 4.0/4.0

#### **Awarded 2010 NSERC Doctoral Award**

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 Chief 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.

## INTERESTS

- **Cloud Computing:** I have developed novel mechanisms in the space of cloud scalability, and continue to expand my interests in the area with a focus on security, performance, and big data workloads.
- **Virtual Desktops:** I have applied my cloud expertise to improve boot-strapping and to optimize the runtime memory footprint of virtualized desktops hosted in shared infrastructure.
- **Virtualization:** I am an expert in the field with several publications, patent applications, and product development contributions, with a strong focus on performance and technical innovation.
- **Storage:** I have researched storage performance in the context of disaster recovery of cloud VMs.
- **Mobile Devices:** I have worked on the challenges arising from the power constraints of mobile devices particularly in the context of security, and UMTS (3G) network utilization.
- **High Performance Computing:** I am an experimentalist 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 hypervisor services, 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 signal propagation and node mobility models employed in mobile multihop wireless ad hoc network simulations.

## PUBLICATIONS

### Conference

vTube: Efficient Streaming of Virtual Appliances Over Last-mile Networks

Yoshihisa Abe, Roxana Geambasu, Kaustubh Joshi, H. Andrés Lagar-Cavilla, M. Satyanarayanan

**SOCC 2013**: Symposium on Cloud Computing.

Self-Service Cloud Computing

Shakeel Butt, H. Andrés Lagar-Cavilla, Abhinav Srivastava, and Vinod Ganapathy

**CCS 2012**: Conference on Computer and Communications Security. Acceptance rate: 19%

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%.

### 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 Touns, 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>

## HONORS AND AWARDS

### Inventor of the Year Award

May 2012. University of Toronto  
Granted to professors and students who have successfully commercialized an academic innovation.

### NSERC Doctoral Prize

May 2010. Award Value: 10K CAD  
Granted yearly to two recipients among all Canadian PhD graduates in all engineering and computer science disciplines.

### Best Paper Award – Eurosyst 2009

Eurosyst is ranked 11<sup>th</sup> 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

## PATENTS

Method and System for Workload Distributing and Processing Across a Network of Replicated Virtual Machines. US 2011156922  
Balancing Malware Rootkit Detection with Power Consumption on Mobile Devices. US 20120291126  
Managing Memory Across a Network of Cloned Virtual Machines. US 20120117298  
Methods and Apparatus to Provision Virtual Machine Resources. US 20130055252  
Method and System for Memory Oversubscription of Virtual Machines. WO 2013149343

## 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.

Snowbird: Interactive Resource-Intensive Applications Made Easy

Systems Design and Implementation, Lectures in Computer Science Seminar, **Carnegie Mellon University**. Pittsburgh, PA, September 2007.

## TEACHING and MENTORING

**Mentor**, AT&T Labs Research

May 2010 – October 2011

Mentor to graduate interns Jeffrey Bickford, Yoshihisa Abe and Shakeel Butt.

**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**, 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

**Program Committee Member**

- CCSW 2013, Cloud Computing Security Workshop

**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