

JOHN RUSSELL LANGE

Curriculum Vitae

University of Pittsburgh
Department of Computer Science
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Research Interests

My research focuses on the design of core systems software capable of fully utilizing next generation hardware environments while at the same time being amenable to dynamic resource managers. My research is based specifically in the context of high performance computing. To increase the applicability of high performance systems, I seek to provide unmodified applications transparent access to high performance resources. My research predominantly uses virtualization mechanisms to achieve these goals. My methods are based on the design, implementation and evaluation of experimental systems.

Education

2010	<i>Northwestern University</i> Ph.D. in Computer Science Thesis: Symbiotic Virtualization Advisor: Peter A. Dinda M.S. in Computer Science, June 2006
2003	<i>Northwestern University</i> B.S. in Computer Science B.S. in Computer Engineering

Employment

September 2010 to present	Assistant Professor, <i>University of Pittsburgh</i>
Winter 2009	Adjunct Lecturer, <i>Northwestern University</i>
6/07 - 9/08	Software engineer, <i>Neokast LLC</i>
Summer 2007	<i>Symantec Research Labs</i>
Summer 2006	<i>Symantec Research Labs</i>
2004 - present	Graduate Research Assistant, <i>Northwestern University</i>
1/04 - 9/04	Research Associate, <i>International Center for Advanced Internet Research</i>
6/02 - 12/03	Research Assistant, <i>Northwestern University</i>
Summer 2001	Software Developer, <i>Medical Metrics Inc</i>
Summer 2000	IT Intern, <i>Fulbright and Jaworski, LLP.</i>
1/99	IT Intern, <i>Rice University</i>
8/98 - 9/99	System Administrator, <i>The Kinkaid School</i>
8/01 - present	Co-founder/Board Member, <i>Artifex.org</i>

Teaching

September 2010	CS 1652/TELCOM 2310: Data Communication and Computer Networks
Winter 2009	Taught MSIT short course on Resource Virtualization and the Enterprise
Winter 2007	Teaching Assistant for Introduction to Electrical Engineering
Winter 2006	Teaching Assistant for Resource Virtualization
Fall 2006	Teaching Assistant for Operating Systems
Fall 2006	Teaching Assistant for Probabilistic Systems and Random Signals

Co-Advised Students

Steven Jaconette	Co-advised Northwestern University undergraduate NSF REU (Summer 2009)
Andy Gocke	Co-advised Northwestern University undergraduate NSF REU (Summer 2009)
Rob Deloatch	Co-advised University of Maryland undergraduate Northwestern SROP program (Summer 2009)
Matt Wojcik	Co-advised Northwestern University undergraduate NSF REU (Summer 2008)
Peter Kamm	Co-advised Northwestern University undergraduate NSF REU (Summer 2008)

Honors

2007 - 2008	<i>Symantec Graduate Research Fellowship Recipient</i>
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Professional Activities

<i>Program Committee</i> The 5th International Workshop on Virtualization Technologies in Distributed Computing	VTDC 2011
<i>Program Committee</i> The 20th International Symposium on High Performance Distributed Computing	HPDC 2011
<i>Publicity Co-Chair</i> The 20th International Symposium on High Performance Distributed Computing	HPDC 2011
<i>Program Committee</i> The 30th IEEE International Conference on Computer Communications	INFOCOM 2011
<i>Program Committee</i> The 19th International Symposium on High Performance Distributed Computing	HPDC 2010
<i>Student Activities Co-Chair</i> The 19th International Symposium on High Performance Distributed Computing	HPDC 2010
<i>Program Committee</i> The 3rd International Workshop on Virtualization Performance: Analysis, Characterization, and Tools	VPACT 2010
<i>Program Committee</i> The 4th International Workshop on Virtualization Technologies in Distributed Computing	VTDC 2010
<i>Program Committee</i> The 1st Workshop on Managed Many-Core Systems	MMCS 2009
<i>Program Committee</i> The 3rd International Workshop on Virtualization Technologies in Distributed Computing	VTDC 2009
<i>Program Committee</i> The 3rd Workshop on System-level Virtualization for High Performance Computing	HPCVirt 2009
<i>Program Committee</i> The 1st International Workshop on Grid over Optical Burst Switching Networks	GOBS 2007
<i>Co-Founder</i> Northwestern Graduate Research Seminar	

Software

<i>Palacios VMM</i>	OS Independent Embeddable Virtual Machine Monitor Released as open source under BSD license Downloaded over 1000 times as of July 2009
<i>EmNet</i>	Empathic home network traffic optimization system
<i>Speculative VNC</i>	Extended VNC client with embedded Markov predictor
<i>Virtuoso</i>	Distributed management service for a virtual machine marketplace Server management service and web based frontend interface
<i>VTL</i>	Framework for implementing transparent network services
<i>VNET</i>	Layer 2 overlay network for networking of wide area distributed virtual machines
<i>PERSONA</i>	Network path component resource scheduler for circuit switched optical networks

Publications

Journals

- G. Hoang, C. Bae, J. Lange, L. Zhang, P. Dinda, R. Joseph, **A Case for Alternative Nested Paging Models for Virtualized Systems**, *Computer Architecture Letters*, (To Appear) CAL
- L. Xia, J. Lange, P. Dinda, C. Bae, **Investigating Virtual Passthrough I/O on Commodity Devices**, *Operating Systems Review*, Volume 43, Number 3, July 2009 OSR
- J. Mambretti, D. Lillethun, J. Lange, J. Weinberger, **Optical Dynamic Intelligent Network Services (ODIN): An Experimental Control-Plane Architecture for High-Performance Distributed Environments Based on Dynamic Lightpath Provisioning**, *IEEE Communications Magazine*, Volume 44, Number 3, March 2006 IEEE Communications
- A. Sundararaj, M. Sanghi, J. Lange, P. Dinda, **An Optimization Problem in Adaptive Virtual Environments**, *Performance Evaluation Review*, Volume 33, Number 2, September 2005 PER

Conferences

- J. Lange, P. Dinda, **SymCall: Symbiotic Virtualization Through VMM-to-Guest Upcalls**, *Proceedings of the 2011 ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments* **Acceptance Rate: 30%** VEE 2011
- J. Lange, K. Pedretti, P. Dinda, P. Bridges, C. Bae, P. Soltero, A. Merritt, **Minimal Overhead Virtualization of a Large Scale Supercomputer**, *Proceedings of the 2011 ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments* **Acceptance Rate: 30%** VEE 2011
- J. Lange, K. Pedretti, T. Hudson, P. Dinda, Z. Cui, L. Xia, P. Bridges, M. Levenhagen, R. Brightwell, A. Gocke, S. Jaconette, **Palacios: A New Open Source Virtual Machine Monitor for Scalable High Performance Computing**, *Proceedings of the 24th IEEE International Parallel & Distributed Processing Symposium* **Acceptance Rate: 24%** IPDPS 2010
- J. S. Miller, J. Lange, P. Dinda, **EmNet: Satisfying the Individual User Through Empathic Home Networks**, *Proceedings of IEEE INFOCOM 2010* **Acceptance Rate: 17.5%** INFOCOM 2010
- J. Lange, J. S. Miller, P. Dinda, **EmNet: Satisfying the Individual User Through Empathic Home Networks: Summary (poster)**, *Proceedings of ACM Sigmetrics 2009* SIGMETRICS 2009
- J. Lange, P. Dinda, S. Rossoff, **Experiences with Speculative Remote Display**, *Proceedings of the USENIX Annual Technical Conference*, **Acceptance Rate: 19%** USENIX 2008
- J. Lange, P. Dinda, F. Bustamante, **Vortex: Enabling Cooperative Selective Wormholing for Network Security Systems**, *Proceedings of the 16th IEEE International Symposium on Recent Advances in Intrusion Detection*, **Acceptance Rate: 16%** RAID 2007
- J. Lange, P. Dinda, **Transparent Network Services via a Virtual Traffic Layer for Virtual Machines**, *Proceedings of the 16th IEEE International Symposium on High Performance Distributed Computing*, **Acceptance Rate: 20%** HPDC 2007
- A. Sundararaj, M. Sanghi, J. Lange, P. Dinda, **Hardness of Approximation and Greedy Algorithms for the Adaptation Problem in Virtual Environments (Poster)**, *Proceedings of the 3rd IEEE International Conference on Autonomic Computing* ICAC 2006
- J. Lange, A. Sundararaj, P. Dinda, **Automatic Dynamic Run-time Optical Network Reservations**, *Proceedings of the 14th IEEE International Symposium on High Performance Distributed Computing*, **Acceptance Rate: 17%** HPDC 2005

Workshops

- L. Xia, J. Lange, P. Dinda, **Towards Virtual Passthrough I/O on Commodity Devices**, *Proceedings of the 1st Workshop on I/O Virtualization* WIOV 2008
- A. Sundararaj, M. Sanghi, J. Lange, P. Dinda, **An Optimization Problem in Adaptive Virtual Environments**, *Proceedings of the 7th Workshop on Mathematical Performance Modeling and Analysis* MAMA 2005

Technical Reports

- J. Lange, K. Pedretti, T. Hudson, P. Dinda, Z. Cui, P. Bridges, S. Jaconette, M. Levenhagen, R. Brightwell, P. Widener, **Palacios and Kitten: High Performance Operating Systems For Scalable Virtualized and Native Supercomputing**, *Department of Electrical Engineering and Computer Science, Northwestern University*, July 2009 NWU-EECS-09-14
- J. S. Miller, J. Lange, P. Dinda, **EmNet: Satisfying the Individual User through Empathic Home Networks**, *Department of Electrical Engineering and Computer Science, Northwestern University*, April 2009 NWU-EECS-09-05
- J. Lange, P. Dinda, **An Introduction to the Palacios Virtual Machine Monitor – Release 1.0**, *Department of Electrical Engineering and Computer Science, Northwestern University*, November 2008 NWU-EECS-08-11
- D. Choffnes, J. Lange, A. Kuzmanovic, **Rethinking the Use of Parallel TCP in Web Browsers**, *Department of Electrical Engineering and Computer Science, Northwestern University*, October 2006 NWU-EECS-06-15
- A. Sundararaj, M. Sanghi, J. Lange, P. Dinda, **Hardness of Approximation and Greedy Algorithms for the Adaptation Problem in Virtual Environments**, *Department of Electrical Engineering and Computer Science, Northwestern University*, July 2006 NWU-EECS-06-06
- A. Shoykhet, J. Lange, P. Dinda, **Virtuoso: A System for Virtual Machine Marketplaces**, *Department of Computer Science, Northwestern University*, July 2004 NWU-CS-04-39
- B. Cornell, J. Lange, P. Dinda, **An Implementation of Diffusion in the Linux Kernel**, *Department of Computer Science, Northwestern University*, September 2002 NWU-CS-02-12

Patents

- P. Dinda, A. Sundararaj, J. Lange, A. Gupta, B.Lin, **Methods and Systems for Automatic Inference and Adaptation of Virtualized Computing Environments** Patent # 20080155537