

WOLFGANG O. H. RICHTER

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EDUCATION

CARNEGIE MELLON UNIVERSITY, SCHOOL OF COMPUTER SCIENCE
Computer Science Department PhD Program August 2009 - Present
Advisor: Mahadev Satyanarayanan
Research Interests: Cloud Virtual Machine Introspection and Retrospection

UNIVERSITY OF VIRGINIA, SCHOOL OF ENGINEERING AND APPLIED SCIENCE
Bachelor of Science with Highest Distinction, Computer Science August 2005 - May 2009
Applied Mathematics Minor
Engineering Business Minor
Cumulative GPA: 3.9

PUBLICATIONS

Wolfgang Richter, Mahadev Satyanarayanan, Jan Harkes, and Benjamin Gilbert. ***Near-Real-Time Inference of File-Level Mutations from Virtual Disk Writes***. CMU Technical Report CMU-CS-12-103.

Wolfgang Richter, Glenn Ammons, Jan Harkes, Adam Goode, Nilton Bila, Eyal de Lara, Vasanth Bala, and Mahadev Satyanarayanan. ***Privacy-Sensitive VM Retrospection***. HotCloud 2011: 3rd USENIX Workshop on Hot Topics in Cloud Computing (Portland, Oregon, 2011).

Ardalan Amiri Sani, Wolfgang Richter, Xuan Bao, Trevor Narayan, Mahadev Satyanarayanan, Lin Zhong, and Romit Roy Choudhury. ***Opportunistic Content Search of Smartphone Photos***. Rice University, Technical Report, TR0627-2011.

Xuan Bao, Trevor Narayan, Ardalan Amiri Sani, Wolfgang Richter, Romit Roy Choudhury, Lin Zhong, and Mahadev Satyanarayanan. ***The Case for Context-Aware Compression***. HotMobile 2011: 12th Workshop on Mobile Computing Systems and Applications (Phoenix, Arizona, 2011).

Mahadev Satyanarayanan, Wolfgang Richter, Glenn Ammons, Jan Harkes, and Adam Goode. ***The Case for Content Search of VM Clouds***. CloudApp 2010: The First IEEE International Workshop on Emerging Applications for Cloud Computing (Seoul, South Korea, 2010).

Wolfgang Richter, Glenn Ammons, Jan Harkes, Adam Goode, Nilton Bila, Eyal de Lara, and Mahadev Satyanarayanan. ***The Manna Plug-In Architecture for Content-based Search of VM Clouds***. CMU Technical Report CMU-CS-10-111.

Wolfgang Richter. ***GridDL: an HTTP bandwidth sharing framework***. In Proceedings of the 1st ACM Workshop on User-Provided Networking: Challenges and Opportunities (Rome, Italy, December 1, 2009). U-NET '09. ACM, New York, NY, 37-42.

UNDER REVIEW

Wolfgang Richter, Canturk Isci, Jan Harkes, Benjamin Gilbert, Vasanth Bala, and Mahadev Satyanarayanan. ***Scalable Real-Time Extraction of Log File Updates from VMs***. FAST 2013: 11th USENIX Conference on File and Storage Technologies (San Jose, California 2013).

Hrishikesh Amur, Wolfgang Richter, Athula Balachandran, Erik Zawadzki, David G. Andersen, Michael Kaminsky, and Karsten Schwan. **Memory-Efficient GroupBy-Aggregate using Compressed Buffer Trees**. FAST 2013: 11th USENIX Conference on File and Storage Technologies (San Jose, California 2013).

Ardalan Amiri Sani, Wolfgang Richter, Xuan Bao, Trevor Narayan, Lin Zhong, Romit Roy Choudhury, and Mahadev Satyanarayanan. **Real-Time Opportunistic Search of Photos in Smartphone Cloud**. PerCom 2013: The 11th IEEE Conference on Pervasive Computing and Communications (San Diego, California 2013).

ACADEMIC AND VOLUNTEER EXPERIENCE

CARNEGIE MELLON UNIVERSITY RESEARCH

Graduate Student

August 2009 - Present

- TA Computer Networks, materials: <https://github.com/theonewolf/15-441-Recitation-Sessions>
- Xray: Main research project for cloud-scale virtual disk VMI
- Terranova: Exploring VM image library analytics and started at IBM T.J. Watson
- Contact Sheets: A project exploring energy and bandwidth efficient search of mobile devices
- Nanuk: Exploring deep search of VM images and the provenance of data and code in the cloud
- Minni: A performant MapReduce C++ implementation, based on partial-aggregation
- Parallel Semantic Texton Forests: A clean-slate implementation of Semantic Texton Forests for high-concurrency

ACM XRDS BLOG

Professional Blogger

July 2012 - Present

- <http://xrds.acm.org/blog/>
- Publish articles every 3-5 weeks, syndicated in ACM XRDS magazine

ACM SOSP'13 WEBSITE

Volunteer Webmaster

May 2012 - Present

- <http://sigops.org/sosp/sosp13/>
- Implemented and maintain Bootstrap-backed website for SOSP 2013 conference

OPEN SOURCE TRIPLED PROJECT

Author

June 2011 - Present

- <https://github.com/theonewolf/TripleD>
- Simple distributed file system based on Google's GFS implemented in Python

OPEN SOURCE LIBPERF PROJECT

Author

December 2010 - Present

- <https://github.com/theonewolf/libperf>
- First userland wrapping library for the new Linux kernel perf subsystem
- Useful for efficient profiling of code characteristics such as L1 cache hits etc.

UNIVERSITY OF VIRGINIA COMPUTER SCIENCE DEPARTMENT

Undergraduate Teaching Assistant

January 2009 - May 2009

- TA Operating Systems course under Sang Son, helped design assignments and with grading
- Held office hours and led tutorial sessions

UNIVERSITY OF VIRGINIA RESEARCH

Undergraduate Researcher

August 2007 - May 2009

- Worked with our Distributed Systems Group doing Java development - Genesis II Project, led by Andrew Grimshaw

- Presented Google's MapReduce clustering system to the entire CS department as a new area of research, guided by Anita Jones
- Worked with a graphics research team under Jason Lawrence using MapReduce

OPEN SOURCE COFFEEMUD PROJECT

GNU/Linux Troubleshooter

June 2004 - December 2004

- Provided email support for installation and maintenance on UNIX and GNU/Linux Systems
- Worked on several shell scripts to ensure easy installation on UNIX and GNU/Linux systems
- Documented installation of the CoffeeMUD Project for UNIX and GNU/Linux users systems

WORK EXPERIENCE

IBM RESEARCH, IBM T.J. WATSON RESEARCH CENTER, HAWTHORNE, NY

Research Intern

May 2011 - August 2011

- Researched inference of software components using machine learning
- Inference methods included both supervised and unsupervised learning
- Supervised methods: logistic regression, deterministic file sets, and bloom filters as features
- Unsupervised methods: file timestamp-based clustering
- Resulted in a full system implementation as a web application operating on 1700+ VMs
- Underlying technologies being transferred into IBM products including Tivoli Image Library

SAIC, CHANTILLY, VIRGINIA

Software Engineering Intern

May 2009 - August 2009

- Worked as a software development intern creating a GUI for a DSP PCI card
- Produced Qt-based GUI and several X-Midas primitives

ARGON ST, NEWINGTON, VIRGINIA

DSP Software Intern

May 2008 - August 2008

- Developed and maintained project testing software in Java
- Worked with embedded systems in C (DSP Processor development)
- Obtained Secret Clearance

CGI FEDERAL, ALEXANDRIA, WASHINGTON D.C.

Technical Consultant

May 2007 - August 2007

- Worked as a contractor for the United States Patent and Trademark Office (USPTO)
- Delivered product presentations and evaluations to management at client site
- Developed and maintained Oracle database software systems for the CGI Federal USPTO project

INFORMATION TECHNOLOGY AND COMMUNICATION, UNIVERSITY OF VIRGINIA

Help Desk Phone Operator

August 2005 - August 2009

- Gained valuable communication skills through conversing with a diverse community
- Troubleshooted general software issues, virus infections, network issues and hardware problems

ACTIVITIES AND AWARDS

- Parallel Data Laboratory, CMU 2010-Present
- Lockheed Martin Leadership Award 2009
- Louis T. Rader Undergraduate Research Award 2009
- Outstanding Education Undergraduate Student 2009
- Outstanding Service Undergraduate Student 2009
- CRA Outstanding Undergraduate Award - Nominee 2008
- Undergraduate Research - Computer Science 2007-2009
- Intermediate Honors, University of Virginia 2007
- IEEE Society Student Member 2006-Present