Nadav Amit

234 Escuela Avenue, Apt 51, Mountain View, California 94040, USA
nadav.amit@gmail.com • +1 (650) 272-9111 • http://nadav.amit.to/ •
Curriculum Vitae compiled on 2018-02-28

EDUCATION	**Technion — Israel Institute of Technology**, Haifa, Israel	

- **Ph.D. in Computer Science** — Mar 2009 – Jul 2014
  - Thesis: Alleviating Virtualization Bottlenecks
  - Advisers: Prof. Assaf Schuster and Prof. Dan Tsafrir
  - Focus: Virtualization, operating systems, performance.

- **B.Sc. in Computer Science** — Oct 2000 – Aug 2004
  - Graduated Cum Laude

RESEARCH EXPERIENCE

VMware Research Group, Palo Alto, CA, USA

- Researcher — Jan 2016 –
  - Projects: new paravirtualization techniques, lowering memory management overheads.
  - Focus: virtualization, operating systems, memory management.

Technion—Israel Institute of Technology, Haifa, Israel

- Senior Research Associate — Aug 2014 – Dec 2015
  - Projects: hypervisors security and stability, efficient memory management.
  - Focus: hypervisors, memory management.
- Teaching Assistant — Mar 2009 – Jul 2014
  - Tutoring "Database Management Systems", "Parallel and Distributed Programming" and "Digital Computer Architecture".

IBM Research Center, Haifa, Israel

- Research Intern — Jul 2009 – Oct 2009
  - Projects: Intel IOMMU emulation, direct delivery of interrupts
  - Focus: hypervisors, I/O.

AWARDS

- Dennis M. Ritchie Doctoral Dissertation Honorable Mention, *ACM SIGOPS* — 2015
- Google Security Patch Reward (10,000USD) — 2015
- SPEC Distinguished Dissertation Award, *SPEC Research Group* — 2014
- IBM PhD fellowship Award, *IBM* — 2012

OTHER ACTIVITY

- Program committee member
  - ACM International Systems and Storage Conference (SYSTOR) — 2017, 2018
  - USENIX Annual Technical Conference (ATC) — 2017
  - ACM Virtual Execution Environments (VEE) — 2017
  - World Wide Web Conference (WWW) — 2017

- External reviewer
  - ACM Architectural Support for Programming Languages and Operating Systems (ASPLOS) — 2018
  - EuroSys Conference — 2015
  - ACM Virtual Execution Environments (VEE) — 2014
  - IEEE Transactions on Computers (TOC) — 2014
  - IEEE Computer Architecture Letters (CAL) — 2013, 2016, 2018
  - ACM International Conference on Supercomputing (ICS) — 2012
  - USENIX Annual Technical Conference (ATC) — 2011

- Reported security vulnerabilities
  - CVE-2014-3610: KVM hypervisor WRMSR emulation vulnerability
  - CVE-2014-3647: KVM hypervisor RIP changing emulation vulnerability
  - CVE-2014-7842: KVM hypervisor emulation failure vulnerability
  - CVE-2014-8480: KVM hypervisor NULL dereference vulnerability
  - CVE-2014-8481: KVM hypervisor NULL dereference vulnerability
  - CVE-2015-0239: KVM hypervisor SYSENTER emulation vulnerability

- Open Source Contributions
  - Linux (KVM, memory management, IOMMU)
  - QEMU emulator
  - LLVM compiler (BPF backend)
  - FreeBSD (IOMMU)
- Academic advising
  - Gil Kupfer (Technion), "IOMMU-resistant DMA attacks," 2016 – co-advising with Prof. Dan Tsafrir

PUBLICATIONS **JOURNALS**

[J-2] Nadav Amit, Michael Wei and Chun-Chung Tu, "Hypercallbacks," ACM Operating System Review (OSR) 51(1), 2017. Based on [C-9].

[J-1] Nadav Amit, Abel Gordon, Nadav Har'El, Muli Ben-Yehuda, Alex Landau, Assaf Schuster and Dan Tsafrir, "Bare-metal performance for virtual machines with exitless interrupts," in Communications of the ACM (CACM), Jan 2016. **Invited to the Research Highlights Section.** Based on [C-3].

CONFERENCES

[C-12] Nadav Amit, Michael Wei. "Hypercallbacks: a new mechanism for trusted, secure introspection", in *Workshop on System Software for Trusted Execution (SysTEX)*, 2017.

[C-11] Marcos K. Aguilera, Nadav Amit, Irina Calciu, Xavier Deguillard, Jayneel Gandhi, Pratap Subrahmanyam, Lalith Suresh, Kiran Tati, Rajesh Venkatasubramanian and Michael Wei. "Remote memory in the age of fast networks," in *ACM Symposium on Cloud Computing (SOCC)*, 2017.

[C-10] Nadav Amit, "Optimizing the TLB shootdown algorithm with page access tracking," in *USENIX Annual Technical Conference (ATC)*, 2017.

[C-9] Nadav Amit, Michael Wei and Chun-Chung Tu, "Hypercallbacks: decoupling policy decisions and execution," in *ACM Workshop on Hot Topics in Operating Systems (HotOS)*, 2017.

[C-8] Nadav Amit, Dan Tsafrir, Assaf Schuster, Ahmad Ayoub and Eran Shlomo, "Validating Virtual CPUs," in *ACM Symposium on Operating Systems Principles (SOSP)*, 2015.

[C-7] Moshe Malka, Nadav Amit, Muli Ben-Yehuda and Dan Tsafrir, "rIOMMU: efficient IOMMU for I/O devices that employ ring buffers," in *ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2015.

[C-6] Moshe Malka, Nadav Amit and Dan Tasfrir. "Efficient intra-operating system protection against harmful DMAs," in *USENIX Conference on File and Storage Technologies (FAST)*, 2015.

[C-5] Nadav Amit, Dan Tsafrir and Assaf Schuster, "VSWAPPER: a memory swapper for virtualized environments" in *ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2014. **Received HiPEAC Award.**

[C-4] Eitan Rosenfeld, Nadav Amit and Dan Tsafrir, "Using disk add-ons to withstand simultaneous disk failures with fewer replicas," in *Workshop on the Interaction amongst Virtualization, Operating Systems and Computer Architecture (WIVOSCA)*, 2013

[C-3] Abel Gordon, Nadav Amit[*], Nadav Har'El, Muli Ben-Yehuda, Alex Landau, Assaf Schuster and Dan Tsafrir, "ELI: Bare-Metal Performance for I/O Virtualization," in *ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2012. **Received the Pat Goldberg Memorial Best Paper Award and HiPEAC Award.**

[C-2] Nadav Amit, Muli Ben-Yehuda, Dan Tsafrir, and Assaf Schuster, "vIOMMU: Efficient IOMMU Emulation," in USENIX Annual Technical Conference (ATC), 2011.

[C-1] Nadav Amit, Muli Ben-Yehuda and Ben-Ami Yassour, "IOMMU: Strategies for Mitigating the IOTLB Bottleneck," in *Workshop on Interaction between Operating System and Computer Architecture (WIOSCA)*, 2010.

UNDER SUBMISSION

[U-3] Nadav Amit and Michael Wei, " The Design and Implementation of Hyperupcalls," in *USENIX Annual Technical Conference (ATC)*, 2018.

[U-2] Nadav Amit, Michael Wei and Dan Tsafrir, "IOMMU: Strategies for Mitigating the IOTLB Bottleneck," in *USENIX Annual Technical Conference (ATC)*, 2018.

[U-1] Marcos K. Aguilera, Nadav Amit, Irina Calciu, Xavier Deguillard, Jayneel Gandhi, Stanko Novakovic, Arun Ramanathan, Pratap Subrahmanyam, Lalith Suresh, Kiran Tati, Rajesh Venkatasubramanian and Michael Wei, "Remote regions: a simple abstraction for remote memory," in *USENIX Annual Technical Conference (ATC)*, 2018.

PATENTS

[P-2] Assaf Schuster, Nadav Amit, Dan Tsafrir. "Memory swapper for virtualized environments", US9811268B2 (granted), product of [C-5].   2017

_____

[*]Both authors contributed equally

[P-1]   Nadav Amit, Shmuel Ben-Yehuda, Abel Gordon, Nadav Har'el, Alex Landau. "Enhancing interrupt handling in a virtual environment", US8892802B2 (granted), product of [C-3].   2014