Daniel Wong

Assistant Professor

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Education

2009–2015 **PhD Electrical Engineering**, *University of Southern California*, Los Angeles, CA.
Thesis: Energy Proportional Computing for Multi-core and Many-core Servers
Advisor: Murali Annavaram
Cumulative GPA: 4.0

2009–2011 **MS Electrical Engineering**, *University of Southern California*, Los Angeles, CA.
Cumulative GPA: 4.0

2006–2009 **BS Computer Engineering/Computer Science**, *University of Southern California*, Los Angeles, CA.
Cumulative GPA: 3.69 Major GPA: 3.74

Employment

2015– **Assistant Professor**, *University of California, Riverside*, Riverside, CA.
Department of Electrical and Computer Engineering
Computer Engineering Program
Department of Computer Science and Engineering, Cooperating Faculty

2014 **Research Intern**, *Samsung Semiconductor, Inc.*, Milpitas, CA.
Memory Solutions Lab, Mentor: Hongzhong Zheng, Suhas
Developed tools to enable performance and cost evaluation of emerging non-volatile memory system architectures. Developed Linux device driver performance emulation and Excel-based TCO analysis tool.

2011 **Computation Student Intern**, *Lawrence Livermore National Lab*, Livermore, CA.
Mentor: Maya Gokhale
Contributed to early work on Perm, a C library dynamic-memory allocator for persistent heap management. Enables lightweight checkpointing and persistency of scientific applications through memory-mapped non-volatile storage.

2010 **Computation Student Intern**, *Lawrence Livermore National Lab*, Livermore, CA.
Mentor: Maya Gokhale
Part of the Cyber Defenders program to explore new technologies that can be applied to computer security. Implemented and evaluated real-world performance of TFIDF HTTP attack classifier on various compute platforms, including Cisco AXP platform and Tilera-64 multicore processors.

Research Experience

2009–2015 **Graduate Research Assistant**, *University of Southern California*, Los Angeles, CA.
Research on energy proportional servers and energy efficient GPGPUs.

2008–2011 **Electrical Team/Technical Advisor**, *USC Robotics Society*, University of Southern California.
Designed and implemented firmware on the Parallax Propeller microcontroller for the SeaBeeIII autonomous underwater vehicle. Firmware is responsible for sensor readings, motor control, and communication with the on-board computer module. Mentored mix of undergraduate and graduate students on embedded systems development.

2008
2010

Project Lead/VSoE Summer Research Intern, *IDM Lab*, University of Southern California.
Advisor: Sven Koenig
Designed and implemented novel hardware and software interface to Lord of the Rings pinball machine. System allows pinball machine to be reprogrammed, essentially turning the pinball machine into an educational and research testbed. Acted as technical advisor for CSCI499: Designing and Implementing Games on Pinball Machines. Managed a team of 6 hardware and software developers (undergraduate and graduate students). University of Alberta replicated our system and resulted in a master's thesis.

Awards and Honors

- IEEE Micro Top Picks from the Computer Architecture Conferences of 2012
- Provost's PhD Fellowship, University of Southern California, 2009-2013
- Nominated for Google PhD Fellowship by USC, 2014
- Honorable Mention Poster Award, 2nd Annual Ming Hsieh Research Festival, 2012
- Rose Hills Undergraduate Summer Research Fellowship, 2009
- Rose Hills Foundation Scholarship, 2008
- Tau Beta Pi Honor Society, 2008
- Eta Kapp Nu (HKN) Honor Society, 2007

Publications

Journals

IEEE Micro '13 **Daniel Wong** and Murali Annavaram. *Scaling the Energy Proportionality Wall with KnightShift.* IEEE Micro, 33(3), May 2013. Top Picks from the Computer Architecture Conferences.

Refereed Conferences and Workshops

HPCA '16 **Daniel Wong**, Nam Sung Kim, and Murali Annavaram. *Approximating Warps with Intra-warp Operand Value Similarity.* In Proceedings of the 2016 IEEE 22nd International Symposium on High Performance Computer Architecture (HPCA), 2016. *to appear*

IISWC '15 **Daniel Wong**, Julia Chen, and Murali Annavaram. *A Retrospective Look Back on the Road Towards Energy Proportionality.* In Proceedings of the 2015 IEEE International Symposium on Workload Characterization (IISWC), 2015.

HPCA '14 **Daniel Wong** and Murali Annavaram. *Implications of High Energy Proportional Servers on Cluster-wide Energy Proportionality.* In Proceedings of the 2014 IEEE 20th International Symposium on High Performance Computer Architecture (HPCA), 2014.

MICRO '13 Mohammad Abdel-Majeed*, **Daniel Wong***, and Murali Annavaram. *Warped Gates: Gating Aware Scheduling and Power Gating for GPGPUs.* In Proceedings of the 46th Annual IEEE/ACM International Symposium on Microarchitecture, MICRO-46, 2013. **Co-authors contributed equally.*

MICRO '12 **Daniel Wong** and Murali Annavaram. *KnightShift: Scaling the Energy Proportionality Wall Through Server-level Heterogeneity.* In Proceedings of the 45th Annual IEEE/ACM International Symposium on Microarchitecture, MICRO-45, 2012. *Selected as 1 of 11 IEEE Micro Top Picks.*

WEED '12 **Daniel Wong** and Murali Annavaram. *Evaluating a Prototype KnightShift-enabled Server.* In WEED'12: Workshop on Energy-Efficient Design, 2012.

MICRO '10 Jainwei Chen, Lakshmi Kumar Dabbiru, **Daniel Wong**, Murali Annavaram, and Michel Dubois. *Adaptive and Speculative Slack Simulations of CMPs on CMPs.* In Proceedings of the 43rd Annual IEEE/ACM International Symposium on Microarchitecture, MICRO-43, 2010.

FDG '10 **Daniel Wong**, Darren Earl, Fred Zyda, Ryan Zink, Sven Koenig, Allen Pan, Selby Shlosberg, Jaspreet Singh, and Nathan Sturtevant. *Implementing Games on Pinball Machines.* In Proceedings of the Fifth International Conference on the Foundations of Digital Games (FDG), 2010.

AAAI '10 **Daniel Wong**, Darren Earl, Fred Zyda, and Sven Koenig. *Teaching Robotics and Computer Science with Pinball Machines.* In AAAI Spring Symposium Series, 2010.

Posters and Technical Reports

D. Wong, S. Lloyd, M. Gokhale, *A Memory-mapped Approach to Checkpointing*. Technical Report LLNL-TR-635611, Lawrence Livermore National Laboratory (LLNL), Livermore, CA, 2013.

I. Karlin, A. Bhatele, B. Chamberlain, J. Cohen, Z. Devito, M. Gokhale, R. Haque, R. Hornung, J. Keasler, D. Laney, E. Luke, S. Lloyd, J. McGraw, R. Neely, D. Richards, M. Schulz, C.H. Still, F. Wang, **D. Wong**, *LULESH Programming Model and Performance Ports Overview*. Technical Report LLNL-TR-608824, Lawrence Livermore National Laboratory (LLNL), Livermore, CA, 2012.

Daniel Wong and Murali Annavaram. *Scalable System-level Active Low-Power Mode with Bounded Latency*. Technical Report CENG-2012-5, Department of Electrical Engineering, University of Southern California, 2012.

Daniel Wong and Murali Annavaram. *Enhancing server energy efficiency by shifting light burden to an assistant*. 2nd Annual Ming Hsiegh Department of Electrical Engineering Research Festival, 2012. Honorable Mention Poster Award, also presented at Sixth USC-Tsinghua Symposium on Green Technology and Energy Informatics.

Daniel Wong, Ryan Zink, and Sven Koenig. *Teaching artificial intelligence and robotics via games* [poster abstract]. In AAAI Symposium on Educational Advances in Artificial Intelligence, 2010.

Daniel Wong and Maya Gokhale. *Real-world performance of document-similarity web attack classifier in embedded hardware*. LLNL Summer Intern Poster Symposium, 2010.

John O'Hollaren, Vairavan Laxman, Noah Olsman, Michael Benzimra, **Daniel Wong**, and Nielson Bernardo. *SeaBee III*. Technical report, University of Southern California Competition Robotics (USCR), University of Southern California, 2010.

Daniel Wong, Darren Earl, Fred Zyda, and Sven Koenig. *Programming Pinball Machines for Fun and Education*. Technical Report 08-901, Department of Computer Science, University of Southern California, 2008.

Teaching

University of California, Riverside

CS 203 Advanced Computer Architectures, scheduled for Winter '16

CS 161 Design and Architecture of Computer Systems, scheduled for Spring '16

University of Southern California

CS 101 Fundamentals of Computer Programming, Fall '11

EE 357 Basic Organization of Computer Systems (Evaluation: 4.76/5.0), Fall '11

EE 554 Real-time Computer Systems (Evaluation: 4.64/5.0), Spring '12

Student Advising

University of California, Riverside

- Amirali Abdolrashidi (PhD, Computer Science)

University of Southern California

- Julia Chen (USC, undergrad, Provost Research Fellowship) - Project: Server power measurement instrumentation
- Justin Kuang (USC, undergrad, McNair Scholar) - Project: GPGPU thread remapping
- Yifei Zhang (Tsinghua University, undergrad) - Project: Solr benchmark development
- Garima Aggarwal (USC, undergrad) - Project: KnightShift prototype

Professional Activities

Invited Reviewer

CAL	Computer Architecture Letters, 2015
TPDS	IEEE Transactions on Parallel and Distributed Systems, 2015
D&T	IEEE Design & Test, 2015

External Reviewer

IPDPS	International Parallel & Distributed Processing Symposium, 2015
MICRO	International Symposium on Microarchitecture, 2014
ICCD	International Conference on Computer Design, 2014
HiPC	International Conference on High Performance Computing, 2014
WEED	Workshop on Energy-Efficient Design, Held in conjunction with ISCA, 2013
IISWC	International Symposium on Workload Characterization, 2012
ISPASS	International Symposium on Performance Analysis of Systems & Software, 2011, 2012
MobiCASE	International Conference on Mobile Computing, Applications, and Services, 2011

Student Volunteer

CPOM	NSF Workshop on Cross-Layer Power Optimization and Management, 2012

Member

IEEE	Institute of Electrical and Electronics Engineers
ACM	Association for Computing Machinery

Personal

US Citizen