

Frederic T. Chong
Curriculum Vitae

Education

Massachusetts Institute of Technology, Ph.D. in Computer Science and Electrical Engineering, 1996.
Massachusetts Institute of Technology, S.M. in Computer Science and Electrical Engineering, 1992.
Massachusetts Institute of Technology, S.B. in Computer Science and Electrical Engineering, 1990.

Professional Experience

University of Chicago, Seymour Goodman Professor of Computer Architecture, 2015-present.
Argonne National Laboratory, Senior Scientist, 2017-present.
University of California at Santa Barbara, Director of the Center for Energy Efficient Computing, 2008-2015.
University of California at Santa Barbara, Director of Computer Engineering, 2007-2015.
University of California at Santa Barbara, Professor, 2005-2015.
University of California at Davis, Associate Professor, 2001-2005.
University of California at Davis, Assistant Professor, 1997-2001.
Stanford University, Visiting Faculty, Winter-Spring 2000.
Massachusetts Institute of Technology, Research Assistant, 1990-1996.
NASA Ames Research Center, Visiting Research Assistant, September-October 1994.
Thinking Machines Corporation, Research Programmer, Summers 1990-1993.
IBM Almaden Research Center, Research Intern, Summers 1988 and 1989.

Awards and Honors

Intel Outstanding Researcher Award 2018 (4 awarded worldwide across all sciences)
Best Poster, Quantum Information Processing 2019 (3 out of 480 posters)
Best Paper, International Symposium on Memory Systems 2017
Best Paper, International Parallel and Distributed Processing Symposium 2014
Best Paper, Computing Frontiers 2014
IEEE Micro Top Pick 2014
ACM Distinguished Scientist 2013
Best Paper, Computing Frontiers 2013
IEEE Micro Top Pick 2010
DARPA Tech Significant Technical Achievement Award 2002 (Most significant DARPA project in 2001 and 2002)
UC Davis Chancellor's Fellow 2002-2007 (~25 fellows university-wide)
NSF CAREER Award 1998-2002
ONR Graduate Fellow 1990-94

PART I. TEACHING

Graduate Degree Committees

MS Committees

<u>Student</u>	<u>Year Degree Completed.</u>	<u>Chair/Member</u>	<u>Optional Info (e.g., Current Employment)</u>
Brian Neely (ECE)	2015	Chair	Raytheon
Jeff Heckey (ECE)	2014	Chair	Staff Researcher, UCSB
Alan Savage	2009	Chair	Google
Arvin Faruque (ECE)	2012	Chair	Nvidia
John McCann (UC Davis)	2001	Chair	Founder, Binary Computer Support Services
Justin Hensley (UC Davis)	2000	Chair	Architect, Apple
Aneet Chopra (UC Davis)	1999	Chair	District Sales Manager, Director Asia Pacific at Intel Corporation

PhD Committees

Student	Year Degree Completed.	Chair/ Member	Optional Info (e.g., Current Employment)
Adam Holmes		Chair	
Yongshan Ding		Chair	
Mohammad Reza Jokar		Chair	
Ryan Wu		Chair	
Pranav Gokhale		Chair	
Yunong Shi		Chair	
Jonathan Baker		Chair	
Casey Duckering		Chair	

Past Committees

Ali Javadi-Abhari (Princeton)	2017	Co-Chair (w/ M. Martonosi)	IBM Research
Summer Deng (UCSB)	2017	Chair	Facebook
Karim Elghamrawy (UCSB)	2016	Chair	VMWare
Heba Saadeldeen (UCSB)	2013	Chair	Intel
Xun Li (UCSB)	2013	Chair	Facebook
Hassan Wassal (UCSB)	2013	Co-Chair (w/ Sherwood)	Google
Vlasia Anagnostopoulou (UCSB)	2011	Chair	Intel
Susmit Biswas (UCSB)	2010	Chair	AMD
Qingqing Yuan (UCSB)	2009	Member	
Daniela Alvim Seabra de Oliveira (UC Davis)	2010	Member	Assistant Prof., University of Florida
Ravishankar Rao (UC Davis)	2006	Chair	Design Engineer, S-Machines (embedded processor startup)
Tzvetan Metodi (UC Davis)	2007	Chair	Research Staff, Sandia National Laboratories
Jedidiah Crandall (UC Davis)	2007	Chair	Associate Prof., U New Mexico
John Oliver (UC Davis)	2007	Co-Chair (w/ V. Akella)	Associate Prof., Calpoly SLO
Darshan Thaker (UC Davis)	2008	Chair	KLA Tencor
Theodore Huffmire	2007	Member	Assistant Prof., NPS
Rakesh Kumar (UCSD)	2006	Member	Assistant Prof, UIUC
Satish Narayanasamy (UCSD)	2007	Member	Assistant Prof, U Michigan
Dean Copsey (UC Davis)	2005	Chair	Intel
Diana Keen (UC Davis)	2002	Chair	Associate Prof., Calpoly SLO
Mark Oskin (UC Davis)	2001	Chair	Associate Prof., U of Washington

Postdoctoral Scholars Supervised

Year	Name
2014-2017	Lunkai Zhang (now at Intel)
2014-2015	Xianyang Jiang (now Associate Prof, Wuhan University, Wuhan, China)
2012	Guoping Long (now Associate Prof, Chinese Academy of Sciences, Beijing, China)
2006	Dean Copsey (now at Intel)

PART II. PROFESSIONAL ACTIVITIES

Recent Lectures Presented

Month/Yr	Title	Meeting/Place
February 2019	Distinguished Lecture: Closing the Gap between Quantum Algorithms and Machines with Hardware-Software Co-Design	UCLA, Los Angeles, CA
February 2019	Closing the Gap between Quantum Algorithms and Machines with Hardware-Software Co-Design	USC, Los Angeles, CA
January 2019	Distinguished Lecture: Closing the Gap between Quantum Algorithms and Machines with Hardware-Software Co-Design	Georgia Tech, Atlanta, GA
December 2018	Panelist: Societal Impact of Expeditions Projects, opening panel for the 10-year celebration of NSF Expeditions in Computing	Washington, DC
October 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	Kyushu University, Fukuoka, Japan
October 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	Micro 2018 Tutorial, Fukuoka, Japan
July 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	DOE ATPESC, St. Charles, IL
July 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	Argonne Quantum Computing Workshop, Lemont, IL
July 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	QuTech, TU Delft, Delft, Netherlands
June 2018	Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	Tutorial, International Symposium on Computer Architecture, Los Angeles, CA
April 2018	Keynote: Opportunities and Challenges in Intermediate-Scale Quantum Computing	CCGrid, Washington, DC
April 2018	Keynote: Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	CERES Summit, Chicago, IL
March 2018	Keynote: Quantum Computing is Getting Real: Architecture, PL, and OS roles in Closing the Gap between Quantum Algorithms and Machines	ACM Symposium on Architectural Support of Programming Languages and Operating Systems (ASPLOS), Williamsburg, VA
March 2018	Distinguished Lecture: Quantum Computing is Getting Real: Architecture, PL, and OS roles in Closing the Gap between Quantum Algorithms and Machines	New Mexico State University, Las Cruces, NM
March 2018	Invited Talk: Closing the Gap Between Quantum Algorithms and Hardware through Software-Enabled Vertical Integration and Co-Design	American Physical Society, March Meeting, Los Angeles, CA
December 2017	Software for Large-Scale and Near-Term Quantum Computing	Fermilab, Batavia, IL
November 2017	Keynote: Quantum Computing and Irregular Applications	Workshop on Irregular Applications, Algorithms and Architectures, SC17, Denver, CO
September 2017	Ideas on Closing the Gap Between Quantum Algorithms and Hardware through Vertical Integration and Co-Design	Intel, Portland, OR
March 2017	Keynote: Enabling Killer Applications for Near-Term Quantum Computers	CERES Summit, Chicago, IL

March 2017	Software and Architectures for Large-Scale and Near-Term Quantum Computing	Microsoft Research, Bellevue, WA
October 2016	Software and Architectures for Large-Scale Quantum Computing	Intel, Portland, OR
September/2016	UChicago Harper Lecture: Software and Architectures for Large-Scale Quantum Computing	Raleigh, NC
June/2016	Software and Architectures for Large-Scale Quantum Computing	EPFL, Lausanne, Switzerland
June/2016	Software and Architectures for Large-Scale Quantum Computing	Delft University, Delft, Netherlands
June/2016	Uncommon Core: Software and Architectures for Large-Scale Quantum Computing	University of Chicago
December/2015	Distinguished Lecture: Software and Architectures for Large-Scale Quantum Computing	Simon Fraser University
October/2015	Software and Architectures for Large-Scale Quantum Computing	University of Wisconsin at Madison
August/2015	Software and Architectures for Large-Scale Quantum Computing	National Security Agency
April/2015	Large-Scale Quantum Computing Architectures: A Systems Perspective	University of California at Davis
February/2015	Quantum Programming Languages for Specification and Optimization	DOE ASCR Workshop on Quantum Computing
February/2015	Distinguished Lecture: Trustworthy Systems through Information Flow Analysis	University of California at Riverside
February/2015	Large-Scale Quantum Computing Architectures: A Systems Perspective	Purdue University
November/2014	Large-Scale Quantum Computing Architectures: A Systems Perspective	University of Chicago
November/2014	Large-Scale Quantum Computing Architectures: A Systems Perspective	University of Colorado at Boulder
October/2014	Large-Scale Quantum Computing Architectures: A Systems Perspective	University of California at Riverside
October/2014	Distinguished Lecture: Trustworthy Systems through Information Flow Analysis	Arizona State University
July/2014	The Energy-Efficiency Gap in Handling Big Data	University of Palermo, Sicily
March/2014	Keynote Address: The Energy-Efficiency Gap in Handling Big Data	IEEE International Symposium on Performance Analysis of Systems and Software
October/2013	Distinguished Lecture: Large-Scale Quantum Computing Architectures: A Systems Perspective	Chinese Academy of Sciences, Beijing
January/2014	Large-Scale Quantum Computing Architectures: A Systems Perspective	University of Central Florida
February/2012	Towards More Sustainable Computing	University of Maryland, College Park
March/2013	Scalable Quantum Computing Architectures	INRIA, Paris, France
April/2013	IEE Computing Solutions: Overview and Recent Highlights	IEE Research Review, UCSB
June/2013	Energy-Efficient Technologies	Istanbul Chamber of Commerce
June/2013	SurfNoC: A Low Latency and Provably Non-Interfering approach to Secure Networks-On-Chip	International Symposium on Computer Architecture, Tel Aviv, Israel
July/2009	Energy-Efficient Computing: Emerging Technologies	Panel on Energy-Efficient Computing, Microsoft Faculty Research Summit, Seattle, WA
August/2009	Information Flow Tracking from the Gates Up	Chalmers University, Gothenburg, Sweden
October/2009	Distinguished Lecture: Towards More Sustainable Computing	UC San Diego

January/2010	Towards More Sustainable Computing	UCSB Society for Advancing Hispanics/Chicanos and Native Americans in Science
February/2010	Potential Collaborations in Security, Optics, and Energy Efficiency	Aerospace Corporation
March/2010	Energy-Proportional Computing Research and Testbed	UCSB IEE Director's Council
May/2010	Design and Verification of Secure Hardware	UCSB Security Day
August/2010	Energy-Proportional Systems Research and the Greenscale Test Datacenter	Citrix, Goleta CA
March/2011	Architecture and Technology Research at UCSB	RAMBUS strategic planning group, Santa Clara, CA
May/2011	Minimal Multithreading - Exploiting Redundancy in Parallel Systems	AMD Research, Seattle, WA
June/2011	Aggressive Optimization and Resource Estimation of Next-Generation Quantum Computing Systems	IARPA Quantum Computing Systems Kickoff, Baltimore, MD
July/2007	System Technologies for Attack Detection and Analysis	George Mason University
August/2007	Parallel Architecture Lectures	Fudan University
August/2007	Synchroscale: A Multi-Clock Domain Mult-Core Next-Generation Digital Signal Processor	Institute for Computing Technology, Chinese Academy of Sciences, Beijing
September/2007	Computer Engineering Strategic Plan	COE IAB, UCSB
October/2007	Computer Engineering Research Highlights	Sony Corp Visit, UCSB
January/2008	System Technologies for Attack Detection and Analysis	UC Davis
February/2008	Design and Computing with Emerging Technologies	Engineering Insights, UCSB
October/2008	Keynote address: Towards More Sustainable Computer Design	International Conference on Computer Design
April/2009	Energy-Efficient Computing and its Resource Implications	Second Forum on Energy and Water Sustainability, Santa Barbara
May/2009	Enabling the Continued Growth of Internet Services	Santa Barbara Summit on Energy Efficiency
June/2009	Towards More Sustainable Computer Design	UCSB Summer Mentorship Program
August/2005	Quantum Computing Architectures: An Overview	Shanghai University (Shanghai, China)
August/2005	Computer Security with Minos	Shanghai University (Shanghai, China)
March/2006	Keynote Address: Nanoscale Fabrication Challenges in Quantum Computing	Foundations of Nanoscience (Snowbird, UT)
July/2006	Panel Position: The Future of Computer Architecture – Emerging Technologies	CRA-W/CDC Workshop on Computer Architecture (Princeton, NJ)

Grants and Contracts Awarded

Total \$56M, PI or Co-Lead \$31M, Co-PI \$25M

Years	Source	Title	Amount	Prin. Invest.
2018-2023	NSF	Expeditions: Enabling Practical-scale Quantum Computation (EPiQC)	10000000	PI
2018-2023	NSF	PFCQC: STAQ: Software-Tailored Architecture for Quantum Co-Design	15000000	Co-PI (PI Brown-GATech)

2016-2017	Intel	Scalable Mapping and Scheduling of Fault-Tolerant Quantum Programs	250000	PI	
2016-2018	LANL	Extensions to the Scaffold Quantum Programming Language and Compiler	900000	PI	
2015	NSF	REU: Scalable Quantum Computers in the Presence of Physical Noise: a Study of Surface Codes with Realistic Errors at the Algorithmic Level	10000	PI	
2014-2017	NSF	Scalable Quantum Computers in the Presence of Physical Noise: a Study of Surface Codes with Realistic Errors at the Algorithmic Level	480000	Co-PI	(PI Brown-GATech)
2012	IARPA	Optimized Resources and Architectures for Quantum aLgorithms (ORAQL) - funding supplement for quantum programming language design	75000	PI	
2012	IARPA	Optimized Resources and Architectures for Quantum aLgorithms (ORAQL) - funding supplement for refined resource estimation	27000	PI	
2012	IARPA	Aggressive Optimization and Resource Estimation of Next-Generation Quantum Computing Systems - funding supplement for refined resource estimation	85000	PI	
2011-2014	NSF	SHF: Creating Efficient, Verifiably-Secure Computing Architectures Using Programming Language Techniques	484000	Co-PI	(PI Hardekopf)
2011-2012	NSF	REU: Minimal Multithreading - Exploiting Redundancy in Parallel Systems	16000	Co-PI	(PI Franklin)
2011-2012	Army-ICB	Energy-Efficient Microprocessors using Memristive Neural Networks for Prediction	140000	PI	
2011-2012	DARPA	Study on the Impact of Photonics on the Next Generation of Data Centers	57000	Co-PI	(PI Blumenthal)
2010-2014	IARPA	Optimized Resources and Architectures for Quantum aLgorithms (ORAQL)	9000000	Co-Lead	(w/ Brown, GATech and Chuang, MIT)
2010-2014	IARPA	Aggressive Optimization and Resource Estimation of Next-Generation Quantum Computing Systems	7000000	Co-Lead	((w/ Pedram and Brun, USC)
2010-2013	NSF	SHF: Minimal Multithreading - Exploiting Redundancy in Parallel Systems	500000	Co-PI	(PI Franklin)
2010-2012	Google	A Data-Centric Approach to Energy-Proportional Computing	1500000	PI	
2010-2011	AFOSR-MURI	DURIP: A Self-Regenerative Architecture for the Incorruptible Enterprise	57000	PI	
2010	Xilinx	Hardware Prototyping Using the Convey Reconfigurable Architecture	57000	PI	
2009-2010	NSF	REU: A Vertical Systems Framework for Effective Defense against Memory-Based Attacks	16000	PI	
2009-2010	NSF	REU: Novel Operations, Circuit Optimization, and Technology Evaluation for Large-Scale, Fault-Tolerant Quantum Computing	16000	PI	
2009-2010	NSF	REU: A Vertical Systems Framework for Effective Defense against Memory-Based Attacks	16000	PI	
2009-2010	NSF	REU: Novel Operations, Circuit Optimization, and Technology Evaluation for Large-Scale, Fault-Tolerant Quantum Computing	16000	PI	

2008-2009	Google	An Innovative Graduate Course in Energy-Efficient Computing	25000	PI	
2008-2009	UCSB Institute for Energy Efficiency	The Rebound Effect: State of the Debate and Implications for Energy Efficiency Research	10000	Co-PI	(PI Geyer)
2007-2012	AFOSR-MURI	Helix: A Self-Regenerative Architecture for the Incorruptible Enterprise	4600000	Co-PI	(PI Knight-UVA, co-PI Su-UC Davis, co-PI Forrest-UNM)
2007-2011	NSF	CT-T: A Vertical Systems Framework for Effective Defense against Memory-Based Attacks	750000	Co-PI	(PI Su-UC Davis)
2007-2010	NSF	EMT: Novel Operations, Circuit Optimization, and Technology Evaluation for Large-Scale, Fault-Tolerant Quantum Computing	250000	Co-PI	(PI Chuang-MIT)
2007-2008	NSF	REU: A Vertical Systems Framework for Effective Defense against Memory-Based Attacks	12000	PI	
2007-2008	Nokia	Repurposing Used Mobile Phones for Surveillance Applications	41000	PI	
2006-2007	NSF	REU: Synchrosalar: Exploiting Synchronized Clock Domains for Energy Efficient Multirate Embedded Systems	12000	PI	
2003-2007	NSF	Synchrosalar: Exploiting Synchronized Clock Domains for Energy Efficient Multirate Embedded Systems	300000	PI	
2001-2006	DARPA	Architectures and Applications for Scalable Quantum Information Systems	3000000	Co-PI	(w/ I. Chuang-MIT and J. Kubiatoicz-Berkeley)
2001-2004	NSF	ITR: Improving System Functionality Using Monitoring Processors	370000	Co-PI	(PI Farrens-UC Davis, co-PI Devanbu-UC Davis)
1998-2003	NSF	CAREER: Care and Feeding of High-Performance Processors with Reconfigurable Memory Systems	230000	PI	
1998-2002	NSF	Multi-Level Parallel Execution on Decoupled Systems	551000	Co-PI	(PI Farrens-UC Davis)

Special Appointments (e.g., Editorships, Officer of Prof. Organization)

Years	Position	Type of Service
2014-2015	Program Co-Chair	International Conference on Supercomputing
2012-2013	Guest Editor	Journal of Sustainable Computing (Elsevier)
2011-2012	Program Co-Chair	International Green Computing Conference
2008-2014	Technical Advisory Board Member	Diversified Global Partners, primary contractor to construct the NOAA primary datacenter

2008-2015	Advisory Board Member	Computer Engineering Program, California Polytechnic State University, San Luis Obispo
2019-present	Associate Editor	ACM Transactions on Quantum Computing
2005-2016	Associate Editor	ACM Transactions on Computer Architecture and Compiler Optimization
2005-2011	Associate Editor	ACM Journal on Emerging Technologies for Computing
2018-2019	Co-Organizer	American Physical Society March Meeting, Session on Programming and Compilation: The QC Stack
2017-2018	Program Committee Member	IEEE Micro Top Picks
2017-2018	Program Committee Member	International Symposium on Computer Architecture
2017-2018	Program Committee Member	International Symposium on Architectural Support for Programming Languages and Operating Systems
2016-2017	Program Committee Member	International Symposium on Microarchitecture
2016-2017	Program Committee Member	International Symposium on Architectural Support for Programming Languages and Operating Systems
2015-2016	Program Committee Member	International Symposium on Computer Architecture
2015-2016	Program Committee Member	IEEE Micro Top Picks
2014-2015	Program Committee Member	International Symposium on Computer Architecture
2014-2015	Program Committee Member	International Symposium on Performance Analysis of Systems and Software
2013-2014	Program Committee Member	International Symposium on Computer Architecture
2014-2015	Program Committee Member	International Symposium on High-Performance Computer Architecture
2014-2015	Program Committee Member	IEEE Micro Top Picks
2014	Program Committee Member	26th International Symposium on Computer Architecture and High Performance Computing
2013-2014	Program Committee Member	International Symposium on Performance Analysis of Systems and Software
2014	Invited Participant	IEEE Rebooting Computing Summit, Santa Cruz, CA
2014	Member	IEEE Computer Society Ad-Hoc Committee on Computer Engineering
2012	Panelist	NRC/ARO The Future of Quantum Computing: A Meeting of Experts, National Academies, Irvine, CA
2011-2010	Program Co-Chair Chair	National Cyber Leap Year Summit, recommendations to the President External Review Committee for the Department of Computer Science at the University of New Mexico
2009-2010	Program Committee Member	IEEE International Symposium on High Performance Computer Architecture
2009-2010	Program Committee Member	IEEE/ACM International Symposium on Code Generation and Optimization (CGO)
2010-2011	Program Committee Member	Annual Computer Security Applications Conference (ACSAC)
2011-2012	Program Committee Member	International Conference for Compilers, Architectures, and Synthesis for Embedded Systems (CASES)
2011-2012	Program Committee Member	IEEE Micro Top Picks
2009-2010	External Program Committee Member	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS)
2010	Track Chair	Santa Barbara Summit on Energy Efficiency
2011	Panel Chair	Santa Barbara Summit on Energy Efficiency

2011	Chair	Organizing committee for IEE/Kavli Roundtable on Large-Scale Datacenters and Clouds
2007	Program Committee Member	Symposium on Architectures for Networking and Communications Systems
2007	Tutorials Co-Chair	International Symposium on Computer Architecture
2007	Panelist	Workshop on Game-changing Solutions for Cyber Security (sponsored by NSF, IARPA, NSA, ONR and OSD)
2007-2008	Program Committee Member	ACM International Conference on Computing Frontiers
2008-2009	Program Committee Member	IEEE International Parallel & Distributed Processing Symposium
2009	Session Organizer	Santa Barbara Summit on Energy Efficiency
2009-2010	Program Committee Member	IEEE International Symposium on High Performance Computer Architecture
2009-2010	Program Committee Member	IEEE/ACM International Symposium on Code Generation and Optimization (CGO)
2007	Program Committee Member	Symposium on Architectures for Networking and Communications Systems
2007	Tutorials Co-Chair	International Symposium on Computer Architecture
2006	Program Committee Member	International Symposium on High-Performance Computer Architecture
2006	Program Committee Member	International Conference on Parallel Architectures and Compilation Techniques
2006	Program Committee Member	SPIE Optics East: Conference on Nanosensing: Materials, Devices, and Systems III
2006	Program Committee Member	Workshop on Architectural and System Support for Improving Software Dependability (ASID)
2006	Vice Program Committee Chair	International Symposium on Computing Frontiers (Track on Non-conventional Computing)

Other Professional Contributions (e.g., Consulting or other application of your professional expertise)

Technical advisor to Diversified Global Partners 2008-2011.
 Consultant for Huawei Technologies 2009-2010.
 Technical Expert for Latham and Watkins, 2001-2002
 Technical Expert for Skjerven, Morrill, and Macpherson, 2002-2003.
 Technical Expert for Covington and Burling 2009-2010.
 Technical Expert for Steptoe 2014.
 Technical Expert for Knobbe and Martin 2014-2018.
 Technical Expert for Benesch 2018.
 Advisory Board, Quantum Circuits Inc. 2018.

Public Service (including service to K-12 Education)

Years	Position	Type of Service
1999-2017	Panelist	Many NSF proposal review panels
2012	Reviewer	SFI Investigators Programme (Irish NSF)
2010-2015	Panelist	AAAS panels for KACST

PART IV. RESEARCH

Cumulative List of Publications (or Creative Activities)

REFEREED PUBLICATIONS

Highlights: 15 ISCA, 7 MICRO, 7 ASPLOS, 2 Micro Top Pick, 1 Nature, 1 PLDI, 1 STOC, 4 Best Papers, 3 books, 1 presidential report, and 6 software releases.

No.	Year	Title and Authors	Publisher	Category
1	1992	“Fault Tolerance And Performance Of Multipath Multistage Interconnection Networks,” F. T. Chong, E. Egozy, and A. DeHon.	Proceedings of the 1992 Brown/MIT Conference on Advanced Research in VLSI and Parallel Systems.	Refereed Conference Paper
2	1992	“Design And Performance Of Multipath MIN Architectures,” F. T. Chong, and T. Knight. http://www.cs.ucsb.edu/~chong/papers/multipath-spaa92.pdf	Proceedings of the 4th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA'92).	Refereed Conference Paper
3	1994	“METRO: A Router Architecture for High-Performance, Short-Haul Routing Networks,” A. DeHon, F. T. Chong, M. Becker, E. Egozy, H. Minsky, S. Peretz, and T. Knight. http://www.cs.ucsb.edu/~chong/papers/metro-isca94.pdf	21st Annual International Symposium on Computer Architecture	Refereed Conference Paper
4.	1994	“Packaging And Multiplexing Of Hierarchical Scalable Expanders,” F. T. Chong, E. Brewer, F. T. Leighton, And T. Knight.	Workshop on Parallel Computer Routing and Communication	Refereed Workshop Paper
5	1994	“Scalable Expanders: Exploiting Hierarchical Random Wiring,” E. Brewer, F. T. Chong, And F. T. Leighton. http://www.cs.ucsb.edu/~chong/papers/STOC94-scalable.pdf	26th Annual ACM Symposium on the Theory of Computing.	Refereed Conference Paper
6	1994	“Building A Better Butterfly: The Multiplexed Metabutterfly.,” F. T. Chong, E. Brewer, F. T. Leighton, And T. Knight.	International Symposium on Parallel Architectures, Algorithms, and Networks (ISPAN).	Refereed Conference Paper
7	1995	“Parallel Sparse Triangular Solution With Partitioned Inverses And Prescheduled DAGs,” F. T. Chong, And R. Schreiber.	Workshop on Solving Irregular Problems on Distributed Memory Machines	Refereed Workshop Paper
8	1995	“Remote Queues: Exposing Message Queues For Optimization And Atomicity,” E. Brewer, F. T. Chong, L. Liu, S. Sharma, And J. Kubiawicz. http://www.cs.ucsb.edu/~chong/papers/SPAA95-RQ.pdf	7th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA'95)	Refereed Conference Paper
9	1995	“Multiprocessor Runtime Support For Fine-Grained, Irregular DAGs,” F. T. Chong, S. Sharma, E. Brewer, And J. Saltz.	Parallel Processing Letters	Article
10	1996	“Application Performance On The MIT Alewife Multi-Processor,” F. T. Chong, B. H. Lim, R. Bianchini, J. Kubiawicz, And A. Agarwal. http://www.cs.ucsb.edu/~chong/papers/alewife-computer96.pdf	IEEE Computer	Article
11	1996	“Construction Of Hierarchical Networks Through Extension,” E. Brewer And F. T. Chong. http://www.patentstorm.us/patents/5519694/description.html	United States, Patent # Patent Number 5,519,694	Patent

12	1997	“Care And Feeding Of High-Performance Processors With Reconfigurable Memory Systems,” F. T. Chong, M. Oskin, T. Sherwood, And J. Hensley.	Work-in-Progress and Poster Session, Proceedings of the Sixteenth ACM Symposium on Operating Systems Principles.	Refereed Short Paper
13	1998	“The Sensitivity Of Communication Mechanisms To Latency And Bandwidth,” F. T. Chong, R. Barua, F. Dahlgren, J. D. Kubiatowicz, And A. Agarwal. http://www.cs.ucsb.edu/~chong/papers/sensitivity.pdf	Fourth International Symposium on High-Performance Computer Architecture	Refereed Conference Paper
14	1998	“Active Pages: A Computation Model For Intelligent Memory,” M. Oskin, F. T. Chong, And T. Sherwood. http://www.cs.ucsb.edu/~chong/papers/AP-isca98.pdf	25th Annual International Symposium on Computer Architecture	Refereed Conference Paper
15	1998	“Low-Power Design Of Page-Based Intelligent Memory,” M. Oskin, F. T. Chong, A. Farooqui, T. Sherwood, And J. Hensley.	Workshop on Power-Driven Micorarchitecture held in conjunction with the 1998 International Symposium on Computer Architecture.	Refereed Workshop Paper
16	1998	“Sharing Data in Page-Based Intelligent Memory,” M. Oskin, T. Sherwood, J. Hensley, S. Yeh, and F. T. Chong.	The Seventh Workshop of Scalable Shared-Memory Multiprocessors held in conjunction with the 1998 International Symposium on Computer Architecture.	Refereed Workshop Paper
17	1999	“The MIT Alewife Machine,” A. Agarwal, R. Bianchini, D. Chaiken, F. T. Chong, K. Johnson, K. Da, J. Kubiatowicz, B. H. Lim, K. Mackenzie, And D. Yeung.	Proceedings of the IEEE	Article
18	1999	“Shared Memory Versus Message Passing for Iterative Solution Of Sparse, Irregular Problems,” F. T. Chong, And A. Agarwal.	Parallel Processing Letters	Article
19	1999	“Cache Coherence in Page-Based Intelligent Memory,” D. Keen, F. T. Chong, M. Oskin, And J. Hensley.	Eighth Workshop on Scalable Shared-Memory Multiprocessors held in conjunction with the 1999 International Symposium on Computer Architecture.	Refereed Workshop Paper
20	1999	“Activeos: Virtualizing Intelligent Memory,” M. Oskin, F. T. Chong, And T. Sherwood.	International Conference on Computer Design.	Refereed Conference Paper
21	1999	“Exploiting ILP in Page-Based Intelligent Memory,” M. Oskin, J. Hensley, D. Keen, F. T. Chong, M. Farrens, And A. Chopra. http://www.cs.ucsb.edu/~chong/papers/AP-micro99.pdf	32nd Annual International Symposium on Microarchitecture (MICRO-32)	Refereed Conference Paper
22	1999	“Active Page Architectures for Media Processing,” J. Hensley, M. Oskin, D. Keen, And F. T. Chong.	Workshop on Media Processors and DSPs, held with the 32nd Annual International Symposium on Microarchitecture.	Refereed Workshop Paper
23	2000	“HLS: Combining Statistical And Symbolic Simulation to Guide Microprocessor Designs,” M. Oskin, F. T. Chong, And M. Farrens. http://www.cs.ucsb.edu/~chong/papers/hls-isca2k.pdf	27th International Symposium on Computer Architecture. Pp 71-82.	Refereed Conference Paper

24	2000	“Cache Coherence in Intelligent Memory Systems,” D. Keen, M. Oskin, J. Hensley, And F. T. Chong.	Workshop on Solving the Memory Wall Problem, held with the International Symposium on Computer Architecture.	Refereed Conference Paper
25	2000	“Reducing Cost And Tolerating Defects in Page-Based Intelligent Memory,” M. Oskin, D. Keen, J. Hensley, L. V. Lita, And F. T. Chong.	International Conference on Computer Design.	Refereed Conference Paper
26	2000	“Algorithmic Complexity with Page-Based Intelligent Memory,” M. Oskin, L. V. Lita, F. T. Chong, J. Hensley, And D. Keen.	Parallel Processing Letters. Pp 99-110.	Article
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109	2011	“Caisson: a Hardware Description Language for Secure Information Flow,” Xun Li, Mohit Tiwari, Jason Oberg, Frederic T. Chong, Tim Sherwood, and Ben Hardekopf. http://www.cs.ucsb.edu/~chong/papers/109-Caisson-pldi.pdf	ACM Conference on Programming Language Design and Implementation. Pp. 109-120.	Refereed Conference Paper
110	2011	“Fighting Fire with Fire: Thermoelectric Cooling in Datacenters,” Susmit Biswas, Mohit Tiwari, Luke Theogarajan, Tim Sherwood, Frederic T. Chong. http://www.cs.ucsb.edu/~chong/papers/110-TEC-isca11.pdf	International Symposium on Computer Architecture. Pp 331-340.	Refereed Conference Paper
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118	2012	“Building Technologies that Help Cyber-Defense: Hardware-enabled Trust,” Claire Vishik, Ruby B. Lee, and Fred Chong.	Information Security Solutions Europe Conference. Pp 316-325.	Refereed Conference Paper
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121	2013	“Quantum Rotations: A Case Study in Static and Dynamic Machine-Code Generation for Quantum Computers,” Daniel Kudrow, Kenneth Bier, Zhaoxia Deng, Diana Franklin, Yu Tomita, Kenneth Brown, and Frederic T. Chong.	International Symposium on Computer Architecture. Pp 166-176.	Refereed Conference Paper
122	2013	“SurfNoC: A Low Latency and Provably Non-Interfering approach to Secure Networks-On-Chip,” Hassan Wassel, Ying Gao, Jason Oberg, Theodore Huffmire, Ryan Kastner, Frederic T. Chong, and Timothy Sherwood.	International Symposium on Computer Architecture. Pp 583-594.	Refereed Conference Paper
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124	2013	“Sapper: A Language for Provable Hardware Policy Enforcement,” X. Li, V. Kashyup, J. Oberg, M. Tiwari, V. R. Rajathinam, R. Kastner, B. Hardekopf, T. Sherwood, and F. T. Chong.	6th ACM SIGPLAN Workshop on Programming Languages and Analysis for Security. Pp 39-44.	Refereed Workshop Paper
125	2013	“Memristors for Neural Branch Prediction: A Case Study in Strict Latency and Write Endurance Challenge,” Hebatallah Saadeldeen, Diana Franklin, Guoping Long, Charlotte Hill, Aisha Browne, Dmitri Strukov, Timothy Sherwood, and Frederic T. Chong.	International Symposium on Computing Frontiers. Pp 26:1--26:10. (Best Paper: Most Promising Paper)	Refereed Conference Paper
126	2013	“QuRE: The Quantum Resource Estimator Toolbox,” Suchara, Kubiawicz, Faruque, Chong, Lai, and Paz.	International Conference on Computer Design. Pp. 419-426.	Refereed Conference Paper
127	2014	“Sapper: A Language for Hardware-Level Security Policy Enforcement,” Xun Li, Vineeth Kashyap, Jason K. Oberg, Mohit Tiwari, Vasanth Ram, Ryan Kastner, Timothy Sherwood, Ben Hardekopf, Frederic T. Chong	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS). Pp. 97-112. (IEEE Top Pick Honorable Mention)	Refereed Conference Paper
128	2014	“Improving Energy Efficiency in Data Centers Beyond Technology Scaling,” Frederic T. Chong, Martijn Heck, Partha Ranganathan, Adel Saleh, and Hassan Wassel	IEEE Design and Test. Pp. 93-104.	Article

129	2014	“ReDHiP: Recalibrating Deep Hierarchy Prediction for Energy Efficiency,” Xun Li, Diana Franklin, Ricardo Bianchini, and Frederic T. Chong.	IEEE International Parallel & Distributed Processing Symposium (IPDPS) (Best Paper: Architecture Track)	Refereed Conference Paper
130	2014	“Networks-On-Chip with Provable Security Properties,” Hassan Wassel, Ying Gao, Jason Oberg, Theodore Huffmire, Ryan Kastner, Frederic T. Chong, and Timothy Sherwood.	IEEE Micro: Micro's Top Picks from Computer Architecture Conferences. Pp. 57-68. (IEEE Micro - top pick)	Article
131	2014	“ScaffCC: A Framework for Compilation and Analysis of Quantum Computing Programs,” Ali JavadiAbbari, Shruti Patil, Daniel Kudrow, Jeff Heckey, Alexey Lvov, Frederic T. Chong, and Margaret Martonosi.	International Symposium on Computing Frontiers. (Best Paper)	Refereed Conference Paper
132	2014	“Characterizing the Performance Effect of Trials and Rotations in Applications that use Quantum Phase Estimation,” Ali JavadiAbbari, Shruti Patil, Jeff Heckey, Chen-Fu Chiang, Margaret Martonosi, and Frederic T. Chong.	IEEE International Symposium on Workload Characterization.	Refereed Conference Paper
133	2014	“The ScaffCC Compiler and Benchmarks (version 1.0),” Ali JavadiAbbari, Shruti Patil, Daniel Kudrow, Jeff Heckey, Alexey Lvov, Frederic T. Chong, and Margaret Martonosi. https://github.com/ajavadia/ScaffCC	Github	Software Release
134	2015	“ScaffCC: Scalable Compilation and Analysis of Quantum Computing Programs,” Ali JavadiAbbari, Shruti Patil, Daniel Kudrow, Jeff Heckey, Alexey Lvov, Frederic T. Chong, and Margaret Martonosi.	Parallel Computing	Article
135	2015	“Compiler Management of Communication and Parallelism for Quantum Computation,” Jeff Heckey, Ali JavadAbhari, Shruti Patil, Daniel Kudrow, Ken Brown, Diana Franklin, Frederic T. Chong, and Margaret Martonosi	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS).	Refereed Conference Paper
136	2015	“Herniated Hash Tables: Exploiting Multi-Level Phase Change Memory for In-Place Data Expansion,” Zhaoxia Deng, Lunkai Zhang, Diana Franklin and Frederic T. Chong.	The International Symposium on Memory Systems	Refereed Conference Paper
137	2016	“IMR: High-Performance Low-Cost Multi-Ring NoCs,” Liu, Shaoli; Chen, Tianshi; Li, Ling; Feng, Xiaoxue; Xu, Zhiwei; Chen, Haibo; Chong, Frederic; and Chen, Yunji	Transactions on Parallel and Distributed Systems	Article
138	2016	“Mellow Writes: Extending Lifetime in Resistive Memories through Selective Slow Write Backs,” Lunkai Zhang, Brian Neely, Diana Franklin, Dmitri Strukov, Yuan Xie, Frederic T. Chong	International Symposium on Computer Architecture	Refereed Conference Paper
139	2016	“Impact of Future Technologies on Architecture,” Trevor Mudge, Frederic T. Chong, Igor Markov, Resit Sendag, Joshua J. Yi, and Derek Chiou	IEEE Micro	Article

140	2014	“The ScaffCC Compiler and Benchmarks (version 2.0),” Ali JavadiAbbari, Adam Holmes, Pranav Gokhale, David Noursi, Lee EHUDIN, Diana Franklin, Margaret Martonosi, and Frederic T. Chong. https://github.com/epiqc/ScaffCC	Github	Software Release
141	2017	“Balancing Performance and Lifetime of MLC PCM by Using a Region Retention Monitor,” Mingzhe Zhang, Lunkai Zhang, Lei Jiang, Zhiyong Liu, and Frederic T. Chong	International Symposium on High-Performance Computer Architecture	Refereed Conference Paper
142	2017	“Challenging On-Chip SRAM Security with Boot-State Statistics,” Joseph McMahan, Weilong Cui, Liang Xia, Jeff Heckey, Frederic T. Chong and Timothy Sherwood	IEEE International Symposium on Hardware Oriented Security and Trust (HOST)	Refereed Conference Paper
143	2017	“Predicting Memory Page Stability and its Application to Memory Deduplication and Live Migration,” Karim Elghamrawy, Diana Franklin, and Frederic T. Chong	International Conference on Supercomputing	Refereed Conference Short Paper
144	2017	“Lemonade from Lemons: Harnessing Device Wearout to Create Limited-Use Security Architectures,” Zhaoxia Deng, Ariel Feldman, Stuart A. Kurtz, and Frederic T. Chong	International Symposium on Computer Architecture	Refereed Conference Paper
145	2017	“Programming Languages and Compilers Designed for Realistic Quantum Hardware,” Frederic T. Chong, Diana Franklin, and Margaret Martonosi	Nature (Insight)	Article
146	2017	“Thermal-aware, heterogeneous materials for improved energy and reliability in 3D PCM architectures,” Hebatallah Saadeldeen, Zhaoxia Deng, Timothy Sherwood and Frederic T. Chong	The International Symposium on Memory Systems (Best Paper)	Refereed Conference Paper
147	2017	“Optimized Surface Code Communication in Superconducting Quantum Computers,” Ali Javadi-Abhari, Pranav Gokhale, Adam Holmes, Diana Franklin, Ken Brown, Margaret Martonosi, and Frederic T. Chong.	The International Symposium on Microarchitecture	Refereed Conference Paper
148	2017	“Memory Cocktail Therapy: A General Learning-Based Framework to Optimize Dynamic Tradeoffs in NVMs”, Zhaoxia Deng, Lunkai Zhang, Nikita Mishra, Henry Hoffman and Frederic T. Chong.	The International Symposium on Microarchitecture	Refereed Conference Paper
149	2017	“Investigating Energy-Efficient Technologies for Next-Generation Optical Interconnection Networks,” Mohammad Reza Jokar, Lunkai Zhang, Yanjing Li, and Frederic T. Chong.	TECHCON	Refereed Conference Paper
150	2017	“Quick-and-Dirty: Improving Performance of MLC PCM by Using Temporary Short Writes,” Mingzhe Zhang, Lunkai Zhang, Lei Jiang, Frederic T. Chong, and Zhiyong Liu	The International Conference on Computer Design	Refereed Conference Short Paper

151	2018	“Compiler Management of Communication and Parallelism for Fault-Tolerant Quantum Computation,” Ali JavadiAbhari, Adam Holmes, Jeff Heckey, Shruti Patil, Daniel Kudrow, Diana Franklin, Ken Brown, Margaret Martonosi, and Frederic T. Chong	ACM Transactions on Computer Systems	Article
152	2018	“The ScaffCC Compiler and Benchmarks (version 3.0),” Ali JavadiAbhari, Adam Holmes, Yongshan Ding, Pranav Gokhale, Yunong Shi, Ryan Wu, Diana Franklin, Margaret Martonosi, and Frederic T. Chong. https://github.com/epiqc/ScaffCC	Github	Software Release
153	2018	“Charm: A Language for Closed-Form High-Level Architecture Modeling,” Weilong Cui, Yongshan Ding, Deeksha Dangwal, Adam Holmes, Joseph McMahan, Ali JavadiAbhari, Georgios Tzimpragos, Frederic T. Chong, and Timothy Sherwood.	International Symposium on Computer Architecture	Refereed Conference Paper
154	2018	“Cooperative NV-NUMA: Prolonging Non-Volatile Memory Lifetime through Bandwidth Sharing,” Mohammad Reza Jokar, Lunkai Zhang and Frederic T. Chong	The International Symposium on Memory Systems	Refereed Conference Paper
155	2018	“Magic-State Functional Units: Mapping and Scheduling Multi-Level Distillation Circuits for Fault-Tolerant Quantum Architectures,” Yongshan Ding, Adam Holmes, Ali Javadi-Abhari, Diana Franklin, Margaret Martonosi, and Frederic T. Chong.	The International Symposium on Microarchitecture	Refereed Conference Paper
156	2018	“The ScaffCC Compiler and Benchmarks (version 4.0),” Ali JavadiAbhari, Adam Holmes, Yongshan Ding, Pranav Gokhale, Yunong Shi, Ryan Wu, Diana Franklin, Margaret Martonosi, and Frederic T. Chong. https://github.com/epiqc/ScaffCC	Github	Software Release
157	2018	“Hybrid Quantum-Classical Computing Architectures,” Martin Suchara, Yuri Alexeev, Frederic Chong, Hal Finkel, Henry Hoffmann, Jeffrey Larson, James Osborn, and Graeme Smith	The 3rd International Workshop on Post-Moore Era Supercomputing (PMES) at SC18	Refereed Workshop Paper
158	2018	“Memory-Efficient Quantum Circuit Simulation by Using Lossy Data Compression,” Xin-Chuan Wu, Sheng Di, Franck Cappello, Hal Finkel, Yuri Alexeev, and Frederic T. Chong	The 3rd International Workshop on Post-Moore Era Supercomputing (PMES) at SC18	Refereed Workshop Paper
159	2018	“Amplitude-Aware Lossy Compression for Quantum Circuit Simulation,” Xin-Chuan Wu, Sheng Di, Franck Cappello, Hal Finkel, Yuri Alexeev, and Frederic T. Chong	The 4th International Workshop on Data Reduction for Big Scientific Data (DRBSD-4)	Refereed Workshop Paper
160	2018	“Full State Quantum Circuits Simulation by Using Lossy Data Compression,” Xin-Chuan Wu, Sheng Di, Franck Cappello, Hal Finkel, Yuri Alexeev, and Frederic T. Chong	Poster at SC18	Refereed Poster and Abstract
161	2019	“Optimized Compilation of Aggregated Instructions for Realistic Quantum Computers,” Yunong Shi, Nelson Leung. Pranav Gokhale. Zane Rossi. David I. Schuster. Henry Hoffmann, and Frederic T. Chong.	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	Refereed Conference Paper

162	2019	“Protecting Page Tables from RowHammer Attacks using Monotonic Pointers in DRAM True-Cells,” Xin-Chuan Wu, Yanjing Li, Timothy Sherwood, and Frederic T. Chong.	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	Refereed Conference Paper
163	2019	“Noise-Adaptive Compiler Mappings for Noisy Intermediate-Scale Quantum Computers,” Prakash Murali, Jonathan M. Baker, Ali Javadi-Abhari, Frederic T. Chong, and Margaret Martonosi.	International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS)	Refereed Conference Paper
164	2019	“Unitary Entanglement Construction in Hierarchical Networks,” Aniruddha Bapat, Zachary Eldredge, James R. Garrison, Abhinav Desphande, Frederic T. Chong, and Alexey V. Gorshkov.	Physics Review A	Article
165	2019	“Quick-and-Dirty: An Architecture for High-Performance Temporary Short Writes in MLC PCM,” Mingzhe Zhang, Lunkai Zhang, Lei Jiang, Frederic T. Chong, and Zhiyong Liu.	IEEE Transactions on Computers	Article
166	2019	“Improved Quantum Circuits via Dirty Qutrits,” Pranav Gokhale, Jonathan Baker, Casey Duckering and Frederic T. Chong.	Conference on Quantum Information Processing (Best Poster, 3 out of 480)	Poster
167	2019	“Formal Constraint-based Compilation for Noisy Intermediate-Scale Quantum Systems,” Prakash Murali, Ali Javadi-Abhari, Frederic T. Chong, and Margaret Martonosi.	Microprocessors and Microsystems	Article
168	2019	“Resource Optimized Quantum Architectures for Surface Code Implementations of Magic-State Distillation,” Adam Holmes, Yongshan Ding, Ali Javadi-Abhari, Diana Franklin, Margaret Martonosi, and Frederic T. Chong.	Microprocessors and Microsystems	Article
169	2019	“Asymptotic Improvements to Quantum Circuits via Qutrits,” Pranav Gokhale, Jonathan Baker, Casey Duckering, Natalie Brown, Ken Brown, and Frederic T. Chong.	International Symposium on Computer Architecture	Refereed Conference Paper