

**Diana M. Franklin**  
*Curriculum Vitae*

**Education**

University of California at Davis, Ph.D. in Computer Science, 2002.

University of Illinois at Urbana-Champaign, MCS. in Computer Science, 1999.

University of California at Davis, B.S. in Computer Science, 1997.

**Area of Specialization**

Computer Science Education, Quantum Computer Education, Quantum Computer Architecture, and Diversity, Equity, and Inclusion

**Professional Experience**

University of Chicago, Computer Science Department, Associate Professor, 2020-present

University of Chicago, Computer Science Department, Research Associate Professor, 2015-2019

University of Chicago, UChicago STEM Education, Director of Computer Science, 2015-2019.

University of Chicago, Computer Science Department, Lecturer, 2015-2019

University of California at Santa Barbara, LSOE, 2008-2015,

100%, Dept of Computer Science, 0% Gevirtz Graduate School of Education

California Polytechnic State University, San Luis Obispo, Associate Professor, 2007

California Polytechnic State University, San Luis Obispo, Assistant Professor, 2002-2007

Seven Pinnacles, consultant, 2006-2007

Compaq VSSAD group, Research Intern, Summer 2000

University of California at Davis, Associate Instructor, ECS 154B: Computer Architecture. Fall quarter, 2000

Lawrence Livermore National Laboratory, Summer Intern, Summer 1997, 1998

**Professional Organizations**

Association for Computing Machinery

IEEE Computer Society

**Awards and Honors**

ICER Best Paper Award: 2020

CHI Honourable Mention Award (ranked top 5% of all submissions), 2018

ICER Best Paper Award: John Henry Award, 2017

NSF Future Directions in Computer Science Education – Part 2 participant, Spring 2014

Frontiers on Engineering Education, National Academy of Engineering, participant, Fall 2013

NCWIT Undergraduate Research Mentoring Award, 2012 (4 chosen nationally)

Outstanding Faculty Member 2011, 2010 voted by graduating CS major seniors

NSF CAREER Award - 2007

Most Inspiring Professor – 2007 voted by all CPE majors

Nominated for SWE Most Supportive Professor Award, 2004, 2005, 2006

IEEE Outstanding Computer Engineering Instructor for 2003 school year voted by all CPE majors

IEEE Outstanding Professor, March 2003 nominated by CPE students

**Prestigious Presentations**

CSTA Plenary Session Speaker, 2023

Invited Facilitator, K-6 Computational Thinking, RPP PI Meeting, 2019

Panelist, CS4IL Summit, Curriculum and Diversity, 2019

Presenter, PreK-5<sup>th</sup> grade CT Integration, STEM+C PI Summit, 2019

Keynote panel, RESPECT conference, 2019

Testified before Congressional Subcommittee about Quantum Computing, 2018. (4 chosen nationally)

**TEACHING**

Courses taught regularly throughout career: Computer Architecture, Introduction to Programming, Data Structures, Computers for Learning (education, game development), Introduction to Quantum Computing for All

**Graduate Degree Committees**

### MS Committees

<b>Student</b>	<b>Year Degree Completed.</b>	<b>Chair/ Member</b>	<b>Optional Info (e.g., Current Employment)</b>
Grace Williams	2024	Chair	
Tianle Liu	2022	Chair	
Qiyu Long	2022	Chair	
Charlotte Hill	2015	Member	Apple
Ayswarya Sundarum (Calpoly)	2008	Member	CISCO

### PhD Committees

<b>Student</b>	<b>Year Degree Completed / (expected)</b>	<b>Chair/ Member</b>	<b>Optional Info (e.g., Current Employment)</b>
Erica Goodwin	2028	Chair	
Minh Tran	2027	Chair	
Jonathan Liu	2026	Chair	
David Gonzalez Maldonado	2026	Chair	
Jean Salac	2021	Chair	Asst. Prof. Carleton College
Yongshan Ding	2021	Member	Asst. Prof. Yale University
Adam Holmes	2020	Member	Intel
Ali JavadiAbhari	2017	Member	IBM
Summer Deng	2017	Member	Facebook
Bryce Boe	2014	Chair	AppFolio
Bitu Mazloom	2013	Member	Foothill College
Hebatallah Saadeldeen	2013	Member	Intel
Susmit Biswas	2010	Member	AMD
Darshan Thaker	2008	Member	KLA Tencor

### Postdoctoral students supervised

<b>Year</b>	<b>Name</b>	<b>Current Employment</b>
2020-23	Jennifer Tsan	WestEd
2019	Janet Liao	Asst. Prof. Georgia State University
2017	David Weintrop	Assoc.. Prof. University of Maryland-College Park
2015	Hilary Dwyer	Manager, Cytrix

### Staff members supervised

<b>Year</b>	<b>Name</b>	<b>Position</b>
2021-23	Brent Yen	Curriculum Development Specialist
2019-22	Donna EATINGER	Curriculum Development Specialist
2018-23	Randy Landsberg	Director of Outreach and Education, EPIQC
2017-20	Susan Krause	Curriculum Development Specialist
2017-present	Jennifer Palmer	Curriculum Development Specialist
2017-21	Carla Strickland	Curriculum Development Specialist

## **PART II. PROFESSIONAL ACTIVITIES**

### Grants and Contracts

*Total \$13M, \$3M as PI, \$2.2M in Education and \$800K in Architecture. Active grants in bold*

<b>Years</b>	<b>Source</b>	<b>Title</b>	<b>Amount</b>	<b>Prin. Invest.</b>
2025-29	NSF	<b>Collaborative Research: CUE-T: Theory-ABCs: Transforming Online Theory Instruction while building Ability, Belonging, and Confidence</b>	\$268K	PI
2024-28	NSF	<b>Quander 2.0: Fostering a QIS learning ecosystem for middle schoolers through informal educator professional development, an online game, and offline play</b>	\$2M	PI

2023-2025	NSF	<b>Q2Work - Creative Extension</b>	<b>\$178K</b>	<b>Co-PI (PI at UIUC)</b>
2022-2026	NSF	<b>Collaborative Research: Harmonizing Encore: Empowering Educators to Create Customized, Culturally Responsive Instructional Materials with Interests of Students</b>	<b>\$1.5M</b>	<b>Co-PI (PI at UMD)</b>
2021-2024	NSF	<b>Building Quantum Information Science Intuition through Digital Games</b>	<b>\$1.35M</b>	<b>PI</b>
2020-2022	NSF	<b>Q2Work: Supporting learners and educators to develop a competitive workforce in quantum information science and technology</b>	<b>\$750K</b>	<b>Co-PI (PI of UChicago Site)</b>
2019-2024	DOE	Improving Pedagogy to Accelerate Computational Thinking (IMPACT)	\$4M	Co-PI (PI at UC Irvine)
2018-2023	NSF	Collaborative Research: EPIQC: Enabling Practical-Scale Quantum Computation	\$10M	Co-PI (PI Chong)
2017-2022	NSF	Scratch Encore: Equity via a Flexible, Culturally-Relevant Advanced Scratch Curriculum for Upper-Elementary Diverse Students and Teachers	\$734K	PI (Co-PIs at CPS, UMaryland)
2017-2021	NSF	Learning Trajectories for Everyday Computing: Integrating Computational Thinking in Elementary Mathematics	\$2.5M	Co-PI (PI of UChicago Site)
2017-2022	NSF	Collaborative Research: Comprehending Code: The role of reading skills and meta-cognition in programming for struggling learners	\$325K	PI (Co-PI at TX State)
2017-2019	anon.	UChicago Lab School Computational Thinking Initiative	\$279K	Co-PI (PI Abelmann)
2015-2017	NSF	Learning Trajectories for Integrating K-5 Computer Science and Mathematics	\$1.2M	SP (6 Co-PIs at UIUC, UChicago)
2012-2015	NSF	CER: DEPICT: Developing Elementary (Learning) Progressions to Integrate Computational Thinking	\$600K	PI (1 Co-PI in Education)
2011-2012	Army-ICB	Energy-Efficient Microprocessors using Memristive Neural Networks for Prediction	\$140K	Co-PI (PI Chong)
2010-2013	NSF	CCF: Minimal Multithreading - Exploiting Redundancy in Parallel Systems	\$500K	PI (1 Co-PI)
2010-2013	NSF	BPC-DP:Animal Tlatoque: A Synergy between Mesoamerican Cultural History and Endangered Species to attract and retain Latina/os and Females in Computer Science	\$533K	PI (2 Co-PIs, 1 in Dept of Chicana/o Studies)
2007-2012	NSF	CAREER: Horseshoes and Hand Grenades: Exploiting Error Tolerance in Applications	\$300K	PI
2006-2009	NSF	MRI: Acquisition of Computing Resources for Management of Reliability through Data Classification and Voltage Overscaling	\$45K	PI
2003-2007	NSF	NSF-ITR: Synchrosalar: Exploiting Synchronized Clock Domains for Energy Efficient Multirate Embedded Systems	\$300K	Co-PI (PI Chong)

### **Products**

**QIS K-12 CS Key Concepts**, a revision of the QIS K-12 Key Concepts for CS audiences

**Collapsing Qubits** card game to introduce quantum computing concepts to broad audiences

**Quander** online game-world to introduce quantum computing concepts to young learners

**Learning Trajectories** for Quantum Superposition, Reversibility, Entanglement, Measurement for K-12 to guide curriculum design

**Learning Trajectories** for Sequence, Conditionals, Iteration, Decomposition, and Debugging for K-12 to guide curriculum design

**Scratch Act 1** – Introductory computing curriculum for 3rd-5th grade students, revision of San Francisco Unified School District’s curriculum to integrate research-based pedagogical approach and learning strategy. Used by schools at SFUSD and Austin Independent School District

**Scratch Encore** – Intermediate culturally-relevant computing curriculum for 5th-8th grade students designed to broaden participation in computing. Used by schools in Chicago Public Schools.

**TIPP&SEE** – Learning Strategy inspired by reading comprehension strategy THIEVES, designed to help upper-elementary school students manage the Scratch programming interface and connect what they see the code do to the code blocks that perform the actions.

**Scratch Charades** –Game for 3rd-5th grade students in which students act out Scratch scripts (code snippets), and other students build those scripts with LEGOs

**Quantum Zines** – Small 8-page pamphlets that introduce quantum computing concepts in broadly accessible ways to broaden participation in computing and quantum computing

### **Special Appointments**

<b>Years</b>	<b>Position</b>	<b>Type of Service</b>
2022-23	General Chair	International Computing Education Research Conference (ICER)
2021-22	Co-General Chair	International Computing Education Research Conference (ICER)
2015-16	Co-General Chair	Southern California Celebration of Women in Computing
2014	Co-Program Chair	Southern California Celebration of Women in Computing
2014	Co-Program Chair	Computing Frontiers 2014
2008	Program Chair	9th Workshop on Computer Architecture Education

### **PART III. SERVICE**

#### **Public Service** (Including service to K-12 education)

<b>Years</b>	<b>Position</b>	<b>Type of Service</b>
2020-24	Executive Board Member	Computing Research Association
2023-24	Member	ECEP Illinois Task Force on Teacher Training
2020	Co-Organizer	Q-12 partnership (national industry workforce development organization)
2020	Co-Lead Writer	Key Concepts for Future QIS Learners Working Group
2019	Member	CS4IL Planning Committee
2019	Member	STEM+C PI Meeting Steering Committee
2015-16	Writer	CS K-12 Frameworks (which informs standards)
2014-16	Member	CSTA Computational Thinking Task Force
2014-15	Member	9-dots after-school program advisory board member
2011-15	Member	ACCESS (Alliance for California Computing Education for Students and Schools)

#### **UChicago Service**

2023-24	Chair	DEIC Committee
2023-24	Member	PSD DEIC Committee
2021-23	Member	College Council
2020-22	Chair	Reopening Committee
2020-22	Member	DEIC Committee
2020-21	Member	Hiring Committee
2017-20	Member	Undergraduate Committee
2015-20	Advisor	CS Major Advisor
2016-19	Co-Advisor	ACM-W

#### **Initiatives**

Mentoring Program: Jointly with ACM-W, organized annual mentoring program and kick-off event.

Grace Hopper: Co-organized trip for 27 students to attend Grace Hopper.

### **PART IV. RESEARCH CONTRIBUTIONS**

<b>No.</b>	<b>Year</b>	<b>Title and Authors</b>	<b>Publisher</b>	<b>Category</b>
1	1999	“Cache Coherence in Page-Based Intelligent Memory,” D. Keen (Franklin), 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

2	1999	"Exploiting ILP in Page-Based Intelligent Memory," M. Oskin, J. Hensley, D. Keen (Franklin), F. T. Chong, M. Farrens, And A. Chopra.	32 <sup>nd</sup> Annual International Symposium on Microarchitecture (MICRO-32)	Refereed Conference Paper
2.5*	1999	"FlexRAM: An Advanced Intelligent Memory System.", Yi Kang, Michael Huang, Seung-Moon Yoon, Zhengho Ge, Diana Keen (Franklin), Vinh Lam, Prattap Pattnaik and Josep Torrellas.	International Conference on Computer Design(ICCD).	Refereed Conference Paper
3	1999	"Active Page Architectures for Media Processing," J. Hensley, M. Oskin, D. Keen (Franklin), And F. T. Chong.	Workshop on Media Processors and DSPs, held with the 32nd Annual International Symposium on Microarchitecture.	Refereed Workshop Paper
4	2000	"Cache Coherence in Intelligent Memory Systems," D. Keen (Franklin), 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
5	2000	"Reducing Cost And Tolerating Defects in Page-Based Intelligent Memory," M. Oskin, D. Keen (Franklin), J. Hensley, L. V. Lita, And F. T. Chong.	International Conference on Computer Design.	Refereed Conference Paper
6	2000	"Algorithmic Complexity with Page-Based Intelligent Memory," M. Oskin, L. V. Lita, F. T. Chong, J. Hensley, And D. Keen (Franklin).	Parallel Processing Letters	Article
7	2001	"Memory Issues in Hardware-Supported Software Safety," D. Keen (Franklin), F. Chong, P. Devanbu, M. Farrens, J. Brown, J. Hollfelder, And X.-T. Zhuang.	Workshop on Memory Performance Issues, held in conjunction with the 28th Annual International Symposium on Computer Architecture	Refereed Workshop Paper
8	2002	"IOP: A Preliminary Study of Instruction-Level Object Parallelism For Superscalars," D. Keen (Franklin), And F. Chong.	Workshop on Memory Performance Issues, held with the 29th International Symposium in Computer Architecture.	Refereed Workshop Paper
9	2002	"Operating Systems Techniques For Parallel Computation In Intelligent Memory," M. Oskin, D. Keen (Franklin), J. Hensley, L. V. Lita, And F. T. Chong.	Parallel Processing Letters	Article
10	2003	"Cache Coherence in Intelligent Memory Systems," D. Keen (Franklin), M. Oskin, J. Hensley, And F. T. Chong.	IEEE Transactions on Computers	Article
11	2003	"Synchrosalar: Initial Design Lessons in Power-Aware Design of Tile-Based Embedded Architectures," J. Oliver, R. Rao, P. Sultana, J. Crandall, E. Cernikowski, L. W. Jones, D. Copsey, D. Keen (Franklin), V. Akella, F. T. Chong.	Workshop on Power-Aware Computing Systems (PACS '03) held in conjunction with the International Symposium on Microarchitecture	Refereed Conference Paper
12	2004	"Synchrosalar: A Multiple Clock Domain Power-Aware Tile-Based Embedded Processor," J. Oliver, R. Rao, P. Sultana, J. Crandall, E. Cernikowski, L. Jones, D. Franklin, V. Akella, And F. T. Chong.	International Symposium on Computer Architecture (ISCA '04)	Refereed Conference Paper
13	2004	"Challenges in Reliable Quantum Computing," D. Franklin And F. Chong.	In Nano, Quantum and Molecular Computing: Implicaitons to High Level Design and Validation. S. Shukla and I. Bahar, editors. Kluwer Academic Publishers.	Book Chapter
14	2005	"Experiences with the Blackfin Architecture for Embedded Systems Education," Diana Franklin and John Seng.	In the Twelfth Workshop on Computer Architecture Education	Refereed Workshop Paper

15	2005	"Improving Non-Stationary Data Retrieval in Wireless Sensor Networks," A. LeBeau, J. Fields, R. Lavering, D. Franklin and J. Seng.	IEEE PerCom Workshop on Sensor Networks and Systems for Pervasive Computing	Refereed Conference Paper
16	2005	"Reliability Requirements of Control, Address and Data Operations in Error Tolerant Applications," D. D. Thaker, D. Franklin, V. Akella and F. T. Chong.	Workshop on Architectural Reliability in conjunction with MICRO-38	Refereed Conference Paper
17	2005	"Synchroscale: Evaluation of an Embedded, Multi-core Architecture for Media Applications," J. Oliver, R. Rao, D. Franklin, V. Akella, and F. T. Chong.	Journal of Embedded Computing	Article
18	2006	"Exploiting Non-Uniform Memory Access Patterns Through Bitline Segmentation," Ravishankar Rao, Justin Wenck, Diana Franklin, Rajeevan Amirtharajah, and Venkatesh Akella.	In the Workshop on Memory Performance Issues, in conjunction with HPCA (High Performance Computer Architecture), February 2006. Chosen as one of 5 papers to be published in SIGMICRO newsletter.	Refereed Workshop Paper
19	2006	"Segmented Bitline Cache: Exploiting Non-Uniform Memory Access Patterns," Ravishankar Rao, Justin Wenck, Diana Franklin, Rajeevan Amirtharajah, and Venkatesh Akella.	International Conference on High Performance Computing (HiPC)	Refereed Conference Paper
20	2006	"Case Studies in Cost, Performance, and Reliability," Diana Franklin.	Computer Architecture - A Quantitative Approach - 4th edition by Hennessy and Patterson, Elsevier Publishers	Book Chapter
21	2006	"Tile Size Selection For Low-Power, Tile-Based Architectures," J. Oliver, R. Rao, D. Franklin, V. Akella, and F. T. Chong.	International Symposium on the Computing Frontiers (20% acceptance rate)	Refereed Conference Paper
22	2006	"Characterization of Error-Tolerant Applications when Protecting Control Data," D. Thaker, D. Franklin, J. Oliver, S. Biswas, D. Lockhart, T. Metodi, F. T. Chong.	IEEE International Symposium on Workload Characterization	Refereed Conference Paper
23	2007	"Gender Differences: Recognizing and Developing Potential in Female Students," Diana Franklin.	Computing Research News, March 2007, Vol. 19, No. 3	Article
24	2007	"Tile Size Selection For Low-Power, Tile-Based Architectures," J. Oliver, R. Rao, D. Franklin, V. Akella, and F. T. Chong.	Transactions on High-Performance Embedded Architectures and Compilers	Article
25	2008	"Active Pages: Memory-Centric Computation," Diana Franklin.	Chapter 6.10 of Reconfigurable Computing: The Theory and Practice of FPGA-Based Computation	Book Chapter
26	2008	"Efficient Fault Tolerance in Multi-media Applications through Selective Instruction Replication," A. Sundarum, A. Akel, D. Lockhart, D. Thaker, and D. Franklin.	Workshop on Radiation Effects and Fault Tolerance in Nanometer Technologies	Refereed Workshop Paper
27	2008	"Preliminary Experiments on Similar Executions with Reduced Off-Chip Accesses in Multi-core Processors," S. Biswas, F. Chong, D. Franklin, and T. Sherwood.	Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures	Refereed Workshop Paper
28	2008	"Proceedings of the 9 <sup>th</sup> Workshop on Computer Architecture Education," D. Franklin and E. Gehringer, eds.	ACM	Book
29	2009	"Multi-Execution: Multicore Caching for Data-Similar Executions," S. Biswas, D. Franklin, A. Savage, R. Dixon, T. Sherwood, F. Chong <a href="http://www.cs.ucsb.edu/~franklin/cv/pubs/isca142-biswas.pdf">http://www.cs.ucsb.edu/~franklin/cv/pubs/isca142-biswas.pdf</a>	International Symposium on Computer Architectures (ISCA'09)	Refereed Conference Paper

30	2009	"Soft Coherence: Preliminary Experiments with Error-Tolerant Memory Consistency in Numerical Applications," G. Long, F. T. Chong, D. Franklin, J. Gilbert, and D. Fan.	Workshop on Chip Multiprocessor Memory Systems and Interconnects	Refereed Workshop Paper
31	2009	"PSMalloc: Content Based Memory Management for MPI Applications," S. Biswas, D. Franklin, T. Sherwood, F. Chong, B. Supinski, M. Schulz	MEDEA 2009 Workshop	Refereed Workshop Paper
32	2009	"Conflict-Avoidance in Multicore Caching for Data-Similar Executions," S. Biswas, D. Franklin, T. Sherwood, F. Chong	International Symposium on Pervasive Systems, Algorithms, and Networks (I-SPAN 2009)	Refereed Conference Paper
33	2010	"eVoices: A Website Supporting Outreach by Attracting Target Groups to Computer Science through Culturally Relevant Themes," S. Jones, A. Hernandez, P. Ortiz, P. Conrad, G. Aldana, D. Franklin.	Conference of the Southwestern Region of the Consortium for Computing Sciences in Colleges (CCSC-SW 10)	Refereed Conference Paper
34	2010	"A Case for Smartphone Reuse to Augment Elementary School Education ," X. Li, P. Ortiz, J. Browne, D. Franklin, J. Oliver, R. Geyer, Y. Y. Zhou, and F. T. Chong.	Work in Progress in Green Computing, held with the International Conference on Green Computing	Refereed Workshop Paper
35	2010	"Smartphone Evolution and Reuse: Establishing a more Sustainable Model," X. Li, P. Ortiz, J. Browne, D. Franklin, J. Oliver, R. Geyer, Y. Y. Zhou, and F. T. Chong.	International Workshop on Green Computing (GreenCom 2010)	Invited Workshop Paper
36	2010	"SBLLMalloc, Version 1," Susmit Biswas, Diana Franklin, Timothy Sherwood, Frederic T. Chong, Bronis R. de Supinski, Martin Schulz.	arch.cs.ucsb.edu/sbllmalloc	Software Release
37	2010	"Minimal Multi-Threading: Finding and Removing Redundant Instructions in Multi-Threaded Processors," Guoping Long, Diana Franklin, Susmit Biswas, Pablo Ortiz, Jason Oberg, Dongrui Fan , Frederic T. Chong	International Symposium On Microarchitecture (MICRO)	Refereed Conference Paper
38	2011	"Animal Tlatoque: Attracting Middle-School Students to Computing through Culturally-Relevant Themes," D Franklin, P Conrad, G Aldana, S Hough, N Avalos Cisneros, F Lopez, A Gonzalez, A Hernandez, S Jones, J Lopez, C Lu, N Moreno, P Ortiz, M Rochin, S Smith	SIGCSE Technical Symposium	Refereed Conference Paper
39	2011	Exercises for Chapter 1, Diana Franklin	Computer Architecture - A Quantitative Approach - 5th edition by Hennessy and Patterson, Elsevier Publishers	Book Chapter
40	2011	Exercises for Appendix C, Diana Franklin	Computer Architecture - A Quantitative Approach - 5th edition by Hennessy and Patterson, Elsevier Publishers	Book Chapter
41	2011	"Exploiting Data Similarity to Reduce Memory Footprints," Susmit Biswas, Bronis R. de Supinski, Martin Schulz, Diana Franklin, Tim Sherwood, Frederic T. Chong	25th IEEE International Parallel & Distributed Processing Symposium (IPDPS'11)	Refereed Conference Paper

42	2011	"Mitigating the Environmental Impact of Smartphones with Device Reuse," Xun Li, Pablo Ortiz, Brandon Kuczenski, Diana Franklin, and Frederic T. Chong.	Sustainable Green Computing: Practices, Methodologies and Technologies	Refereed Book Chapter
43	2011	"Teaching-Oriented Faculty at Research Universities," SIGCSE Teaching-Oriented Faculty Working Group (with contributions by Steve Wolfman, Owen Astrachan, Mike Clancy, Kurt Eiselt, Jeffrey Forbes, Diana Franklin, David Kay, Mike Scott, and Kevin Wayne)	Communications of the ACM	Journal
44	2011	"A Comprehensive Study of Reusing Smartphones to Augment Elementary School Education," X. Li, P. Ortiz, J. Browne, D. Franklin, J. Oliver, R. Geyer, Y. Y. Zhou, and F. T. Chong.	International Journal of Handheld Computing Research	Refereed Journal Paper
45	2012	"Barely Alive Memory Servers: Keeping Data Active in a Low-Power State," V. Anagnostopoulou, S. Biswas, H. Saadeldeen, A. Savage, R. Bianchini, T. Yang, D. Franklin, and F. T. Chong.	ACM Journal on Emerging Technologies in Computing	Refereed Journal Paper
46	2012	"Power-aware Resource Allocation for CPU- and Memory-intense Internet Services," V. Anagnostopoulou, S. Biswas, H. Saadeldeen, R. Bianchini, T. Yang, D. Franklin, and F. T. Chong.	International Workshop on Energy-Efficient Data Centres	Refereed Workshop Paper
47	2013	"Assessment of Computer Science Learning in a Scratch-Based Outreach Program," Diana Franklin, Phillip Conrad, Bryce Boe, Katy Nilsen, Charlotte Hill, Michelle Len, Greg Dreschler, Gerardo Aldana, Paulo Almeida-Tanaka, Brynn Kiefer, Chelsea Laird, Felicia Lopez, Christine Pham, Jessica Suarez, Robert Waite	SIGCSE Technical Symposium	Refereed Conference Paper
48	2013	"Hairball: Lint-inspired Static Analysis of Scratch Projects," Bryce Boe, Charlotte Hill, Michelle Len, Greg Dreschler, Diana Franklin, Phillip Conrad,	SIGCSE Technical Symposium	Refereed Conference Paper
49	2013	"Practical Guide to Gender Diversity for Computer Science Faculty," Diana Franklin <a href="http://www.morganclaypool.com/doi/abs/10.2200/S00495ED1V01Y201304PRO002">http://www.morganclaypool.com/doi/abs/10.2200/S00495ED1V01Y201304PRO002</a>	Morgan-Claypool	Edited Book
50	2013	"Memristors for Neural Branch Prediction: A Case Study in Strict Latency and Write Endurance Challenges," Hebatallah Saadeldeen, Diana Franklin, Guoping Long, Charlotte Hill, Aisha Browne, Dmitri Strukov, Timothy Sherwood and Frederic Chong	Computing Frontiers Harbinger award (best paper)	Refereed Conference Paper
51	2013	"Optimized Code for a Solovay-Kitaev Quantum Rotation Generator," Daniel Kudrow, Kenneth Bier, Zhaoxia Deng, Diana Franklin, and Frederic T. Chong.	<a href="http://www.cs.ucsb.edu/~dkudrow/downloads/skoptimized.tar.gz">http://www.cs.ucsb.edu/~dkudrow/downloads/skoptimized.tar.gz</a>	Software release
52	2013	"Barely Alive Servers: Greener Datacenters Through Memory-Accessible, Low-Power States," Vlasia Anagnostopoulou, Susmit Biswas, Heba Saadeldeen, Alan Savage, Ricardo Bianchini, Tao Yang, Diana Franklin and Frederic T. Chong.	Sustainable Green Computing Systems; Springer Verlag Publishers	Refereed Book Chapter
53	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 (ISCA '13)	Refereed Conference Paper
54	2013	"Computational Thinking for Physics: Programming Models of Physics Phenomenon in Elementary School," Hilary Dwyer, Bryce Boe, Charlotte Hill, Diana Franklin, and Danielle Harlow	Physics Education Research Conference (PERC)	Refereed Conference Paper



55	2014	"Identifying Elementary Students' Pre-Instructional Ability to Develop Algorithms and Step-by-Step Instructions," Hilary Dwyer, Charlotte Hill, Stacey Patterson, Danielle Harlow, and Diana Franklin	SIGCSE Technical Symposium	Refereed Conference Paper
56	2014	"ReDHiP: Recalibrating Deep Hierarchy Prediction for Energy Efficiency," Xun Li, Diana Franklin, Ricardo Bianchini, Fred Chong,	IEEE International Parallel & Distributed Processing Symposium (IPDPS)	Refereed Conference Paper
57	2014	"SpongeDirectory: Flexible Sparse Directories Utilizing Multi-Level Memristors," Lunkai Zhang, Dmitri Strukov, Hebatallah Saadeldeen, Dongrui Fan, Mingzhe Zhang, Diana Franklin	Best Paper - Architecture International Conference on Parallel Architectures and Compilation Techniques (PACT 2014)	Refereed Conference Paper
58	2015	"Putting the CS in Computing Education Research," Diana Franklin	Communications of the Association for Computing Machinery, Viewpoints	Edited Column
59	2015	"Floors and Flexibility: Designing a programming environment for 4th-6th grade classrooms," Charlotte Hill, Hilary Dwyer, Tim Martinez, Ashley Iveland, Alexandria Killian, Danielle Harlow, and Diana Franklin	SIGCSE Technical Symposium	Refereed Conference Paper
60	2015	"Getting Started Teaching and Researching Computer Science in the Elementary Classroom," Diana Franklin, Charlotte Hill, Hilary Dwyer, Ashley Iveland, Alexandria Killian, and Danielle Harlow.	SIGCSE Technical Symposium	Refereed Conference Paper
61	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.	Architectural Support for Programming Languages and Operating Systems (ASPLOS)	Refereed Conference Paper
62	2015	"Programming Languages and Discourse: Investigating the Linguistic Context in Learning Computer Science during Elementary School," Hilary Dwyer, Danielle Harlow, Ashley Iveland, Alexandria Killian, Charlotte Hill, Diana Franklin	AERA (American Education Research Association)	Refereed Poster
63	2015	"Computer Programming in Elementary and Middle School: Connections across Content," Danielle Harlow, Hilary Dwyer, Anne Leak, Charlotte Hill, Ashley Iveland, Diana Franklin	Improving K-12 STEM educational outcomes through technological integration, Hersey IGI Global	Edited Book
64	2015	"Programming Science Digital Stores: Computer science and engineering design in the science classroom," Alexandria Hansen, Ashley Iveland, Hilary Dwyer, Diana Franklin, Danielle Harlow.	Science and Children	Refereed Journal
65	2015	"Interactive Design by Children: A Construct Map for Programming," Alexandria Hansen, Hilary Dwyer, Ashley Iveland, Timothy Martinez, Danielle Harlow, Diana Franklin.	ACM SIGCHI Interactive Design for Children	Refereed Conference Short Paper
66	2015	"Fourth-Grade Students Reading Block-Based Programs: Predictions, Visual Cues, and Affordances," Hilary Dwyer, Charlotte Hill, Alexandria Hansen, Ashley Iveland, Diana Franklin, Danielle Harlow	International Computer Education Research Conference (ICER 2015)	Refereed Conference Paper
67	2016	"Differentiating for Diversity: Using Universal Design for Learning in K-6 Computer Science Education," Alexandria Hansen, Hilary Dwyer, Ashley Iveland, Diana Franklin, Danielle Harlow.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper

68	2016	“Initialization in Scratch: Seeking Knowledge Transfer,” Diana Franklin, Charlotte Hill, Hilary Dwyer, Ashley Iveland, Alexandria Hansen, Danielle Harlow.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
69	2016	“User-Centered Design in Block-Based Programming: Developmental & Pedagogical Considerations for Children,” Alexandria Hansen, Diana Franklin, Danielle Harlow.	ACM SIGCHI Interactive Design for Children (ICS)	Refereed Conference Paper
70	2016	“Mellow Writes: Extending Lifetime in Resistive Memories through Selective Slow Write Backs,” Lunkai Zhang, Brian Neely, Diana Franklin, Dmitri Strukov, Yuan Xie, Fred Chong	International Symposium on Computer Architecture (ISCA'16)	Refereed Conference Paper
71	2017	“Assessing Children’s Understanding of the Work of Computer Scientists: The Draw-a-Computer-Scientist Test,” Alexandria Hansen, Hilary Dwyer, Ashley Iveland, Mia Talesfore, Lacy Wright, Danielle Harlow, Diana Franklin.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
72	2017	“Covering Edge Cases: An Analysis of Computer Science Learning Goals Theorized and Tested in Literature,” Kathryn Rich, Carla Strickland, Diana Franklin.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
73	2017	“Using Upper-Elementary student performance to understand conceptual sequencing in a blocks-based Curriculum,” Diana Franklin, Gabriela Skifstad, Reiny Rolock, Isha Mehrotra, Valerie Ding, Alexandria Hansen, David Weintrop, Danielle Harlow.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
74	2017	“K-8 Learning Trajectories Derived from Research Literature: Sequence, Repetition, Conditionals,” Katherine M. Rich, Carla Strickland, Andrew Binkowski, Cheryl Moran, Diana Franklin.	International Conference on Computer Education Research (ICER '17)	Refereed Conference Paper
75	2017	“Designing Quantum Programming Languages and Compilers Given Hardware Constraints,” Frederic T. Chong, Diana Franklin, Margaret Martonosi.	Nature, Vol. 549 No. 7671 pp 180-187	Refereed Journal
76	2017	“Optimized Surface Code communication in Superconducting Quantum Computers,” Ali Javadi-Abhari, Pranav Gokhale, Adam Holmes, Diana Franklin, Ken Brown, Margaret Martonosi, Frederic T. Chong	International Symposium on Microarchitecture (MICRO)	Refereed Conference Paper
77	2018	“Evaluating CoBlox: A Comparative Study of Robotics Programming Environments for Adult Novices,” David Weintrop, Patrick Francis, Bo Li, Afsoon Afzal, David Shepherd, Jean Salac, Diana Franklin.	ACM CHI Conference on Human Factors in Computing Systems (CHI 2018)	Refereed Conference Paper
78	2018	“Decomposition: A K-8 Computational Thinking Learning Trajectory,” Kathryn M. Rich, T. Carla Strickland, T. Andrew Binkowski, Diana Franklin.	International Conference on Computer Education Research (ICER '18)	Refereed Conference Paper
79	2018	“Starting from Scratch: Outcomes of Early Computer Science Learning Experiences and Implications for What Comes Next,” David Weintrop, Alexandria K. Hansen, Danielle B. Harlow, Diana Franklin.	International Conference on Computer Education Research (ICER '18)	Refereed Conference Paper
80	2018	“Ecological Design-Based Research for Computer Science Education: Affordances and Effectivities for Elementary School students,” Danielle Harlow, Hillary Dwyer, Alexandria Hansen, Ashley Iveland, Diana Franklin.	Cognition and Instruction, pages 1-23	Refereed Journal

81	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, Frederic T. Chong	International Symposium on Microarchitecture (MICRO)	Refereed Conference Paper
82	2019	“A K-8 Debugging Learning Trajectory Derived from Research Literature,” Katherine M. Rich, Carla Strickland, Andrew Binkowski, Diana Franklin.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
83	2019	“An Analysis through an Equity Lens of the Implementation of Computer Science in K-8 Classrooms in a Large, Urban School District,” Jean Salac, Max White, Ashley Wang, Diana Franklin.	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
84	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
85	2019	“Enacting Identities: Participatory Design as a Context for Youth to Reflect, Project, and Apply their Emerging Identities,” Merijke Coenraad, Jennifer Palmer, Diana Franklin, David Weintrop.	Interactive Design for Children (IDC ‘19)	Refereed Conference Paper
86	2019	“The Teacher Accessibility, Equity, and Content (TEC) Rubric for Evaluating Computing Curricula.” David Weintrop, Merijke Coenraad, Jennifer Palmer, & Diana Franklin	ACM Transactions on Computing Education (TOCE)	Refereed Journal
87	2020	“Scratch Encore: The Design and Pilot of a Culturally-Relevant Intermediate Scratch Curriculum,” Diana Franklin, Jen Palmer, Merijke Coenraad, Melissa Cobian, Kristan Beck, Andrew Rasmussen, Susan Krause, Max White, Marco Anaya, Zachary Crenshaw	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
88	2020	“TIPP&SEE: A Learning Strategy to Guide Students through Use->Modify Scratch Activities,” Jean Salac, Cathy Thomas, Choe Butler, Ashley Sanchez, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
89	2020	“Eliciting Student Scratch Script Understandings via Scratch Charades,” Diana Franklin, Jean Salac, Cathy Thomas, Zene Sekou, Susan Krause	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
90	2020	“Patterns in Elementary-Age Student Responses to Personalized & Generic Code Comprehension Questions,” Jean Salac, Qi Jin, Zipporah Klain, Saranya Turimella, Max White, & Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
91	2020	“Comprehending Code: Understanding the Relationship between Reading and Math Proficiency, and 4th-Grade CS Learning Outcomes,” Jean Salac, Cathy Thomas, Bryan Twarek, William Marsland, & Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper

92	2020	“SQUARE: strategic quantum ancilla reuse for modular quantum programs via cost-effective uncomputation ,” Yongshan Ding, Xin-Chuan Wu, Adam Holmes, Ash Wiseth, Diana Franklin, Margaret Martonosi, and Frederic T. Chong.	International Symposium on Computer Architecture (ISCA'20)	Refereed Conference Paper
93	2020	“If They Build It, Will They Understand It? Exploring the Relationship between Student Code and Performance,” Jean Salac, Diana Franklin	Conference on Innovation and Technology in Computer Science (ITiCSE '20)	Refereed Conference Paper
94	2020	“Evaluation and Assessment Needs of Computing Education in Primary Grades,” Rebecca Vivan, Diana Franklin, Dave Frye, Alan Peterfreund, Jason Ravitz, Florence Sullivan, Melissa Zeitz, Monica M. McGill	Conference on Innovation and Technology in Computer Science (ITiCSE '20)	Refereed Conference Paper
95	2020	“Exploring Student Behavior Using the TIPP&SEE Learning Strategy,” Diana Franklin, Jean Salac, Zackary Crenshaw, Saranya Turimella, Zipporah Klain, Marco Anaya, Cathy Thomas	International Conference on Computer Education Research (ICER '20) ( <b>Best Paper</b> )	Refereed Conference Paper
96	2020	“An analysis of Use-Modify-Create Pedagogical Approach’s Success in Balancing Structure and Student Agency,” Diana Franklin, Merijke Coenraad, Jennifer Palmer, Donna Eatinger, Anna Zipp, Marco Anaya, Max White, Hoang Pham, Ozan Gokdemir, David Weintrop	International Conference on Computer Education Research (ICER '20)	Refereed Conference Paper
97	2020	“Exploring Quantum Reversibility with Young Learners,” Diana Franklin, Jen Palmer, Woorin Jang, Elizabeth M. Lehman, Jasmine Marckwordt, Randall H. Landsberg, Alexandria Muller, Danielle Harlow	International Conference on Computer Education Research (ICER '20)	Refereed Conference Paper
98	2021	“Development and Preliminary Validation of the Assessment of Computing for Elementary Students (ACES),” Miranda C. Parker, Yvonne S. Kao, Dana Saito-Stehberger, Diana Franklin, Susan Krause, Debra Richardson, Mark Warschauer	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
99	2021	“The Effects of Providing Starter Projects in Open-Ended Scratch Activities,” Merijke Coenraad, Jen Palmer, David Weintrop, Donna Eatinger, Zachary Crenshaw, Hoang Pham, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
100	2021	“Supporting Diverse Learners in K-8 Computational Thinking with TIPP&SEE,” Jean Salac, Cathy Thomas, Chloe Butler, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
101	2021	“Action Fractions: The Design and Pilot of an Integrated Math+CS Elementary Curriculum Based on CS Learning Trajectories,” Carla Strickland, Kathryn M. Rich, Donna Eatinger, Todd Lash, Andy Isaacs, Maya Israel, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
102	2021	“Investigating the Role of Cognitive Abilities in Computational Thinking for Young Learners,” Jean Salac, Cathay Thomas, Chloe Butler, Diana Franklin	International Conference on Computer Education Research (ICER '21)	Refereed Conference Paper
103	2022	“Reimagining Professional Development for K-8 CS Teachers: Evaluating a Virtual, Diffuse Model,” Jennifer Tsan, Merijke Coenraad, Zachary Crenshaw, Jen Palmer, Donna Eatinger, Kristan Beck, David Weintrop, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
104	2022	“Using participatory design to integrate stakeholder voices in the creation of a culturally relevant computing curriculum,” Merijke Coenraad, Jen Palmer, Donna Eatinger, David Weintrop, Diana Franklin	International Journal of Child-Computer Interaction	Article

105	2022	“Scaffolding Young Learners’ Open-Ended Programming Projects with Planning Sheets,” Jennifer Tsan, Donna Eatinger, Alex Pugnali, David Gonzalez-Maldonado, Diana Franklin, David Weintrop	Conference on Innovation and Technology in Computer Science (ITiCSE ’22)	Refereed Conference Paper
106	2022	“An Analysis of Middle Grade Teachers’ Debugging Pedagogical Content Knowledge,” Jennifer Tsan, David Weintrop, Diana Franklin	Conference on Innovation and Technology in Computer Science (ITiCSE ’22)	Refereed Conference Paper
107	2022	“Investigating the Use of Planning Sheets in Young Learners’ Open-ended Scratch Projects,” David Gonzalez-Maldonado, Alex Pugnali, Jennifer Tsan, Donna Eatinger, Diana Franklin, David Weintrop	International Conference on Computer Education Research (ICER ’22)	Refereed Conference Paper
108	2022	“Comparison of CS Middle-School Instruction during Pre-Pandemic, Early-Pandemic, and Mid-Pandemic School Years,” David Gonzalez-Maldonado, Jennifer Tsan, Donna Eatinger, David Weintrop, Diana Franklin	International Conference on Computer Education Research (ICER ’22)	Refereed Conference Paper
109	2022	“A Pair of ACES: An Analysis of Isomorphic Questions on an Elementary Computing Assessment,” Miranda C. Parker, Leiny Garcia, Yvonne S. Kao, Diana Franklin, Susan Krause, Mark Warschauer	International Conference on Computer Education Research (ICER ’22)	Refereed Conference Paper
110	2023	“Describing Elementary Students’ Spheres of Influence in Scratch ‘About Me’ Projects,” Santiago Ojeda-Ramirez, Jennifer Tsan, Donna Eatinger, Sharin Jacob, Dana Saito-Stehberger, Diana Franklin, Mark Warschauer	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
111	2023	“Qupcakery: A Puzzle Game that Introduces Quantum Gates to Young Learners,” Tianle Liu, David Gonzalez-Maldonado, Danielle B. Harlow, Emily E. Edwards, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
112	2023	“Introduction to Quantum Computing for Everyone: Experience Report,” Jonathan Liu, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
113	2023	“Learner Ideas and Interests Expressed in Open-ended Projects in a Middle School Computer Science Curriculum,” Jennifer Tsan, David Weintrop, Donna Eatinger, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
114	2023	“The Role of Spatial Orientation in Diagram Design for Computational Thinking Development in K-8 Teachers,” Jean Salac, Donna Eatinger, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
115	2023	“How are Elementary Students Demonstrating Understanding of Decomposition within Elementary Mathematics?,” Maya Israel, et. al.	International Conference on Computer Education Research (ICER ’23)	Refereed Conference Paper
116	2023	“An Analysis of Gallery Walk Peer Feedback on Scratch Projects from Bilingual/Non-Bilingual Fourth Grade Students,” Jennifer Tsan, Diana Franklin, et. al.	International Conference on Computer Education Research (ICER ’23)	Refereed Conference Paper
117	2024	“Harmonizing Scratch Encore: Scaffolding K-8 Teachers in Customizing Culturally Responsive Computing Materials,” Minh Tran, Heather Killen, Jen Palmer, David Weintrop, Diana Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
118	2024	“Intersectional Factors that Influence K-2 Students’ Computer Science Learning,” S. Jacob, B. Gillen, S. Ojeda-Ramirez, C. Baek, C. Barrera, D. Franklin, M. Warschauer	RESPECT annual conference	Refereed Conference Paper

119	2025	“Evaluating GPT for use in K-12 Block-Based CS Instruction Using a Transpiler and Prompt Engineering,” D. Gonzalez-Maldonado, J. Liu, D. Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
120	2025	“Can GPT Help? Supporting Teachers to Brainstorm Customized Instructional Scratch Projects,” M. Tran, D. Gonzalez-Maldonado, E. Zhou, D. Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
121	2025	“Teacher Decisions and Perspectives in Scratch TIPP&SEE Implementation,” J. Liu, E. Goodwin, D. Saito-Stehberger, S. Jacob, M. Warschauer, D. Frankli	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper
122	2025	“Student Utilization of Metacognitive Strategies in Solving Dynamic Programming Problems,” J. Liu, E. Goodwin, D. Franklin	Symposium on Computer Science Education (SIGCSE)	Refereed Conference Paper

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