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EDUCATION

University of California, Davis Davis, CA
Ph.D. Department of Computer Science, expected June 2007, Mentor: Dr. Frederic T. Chong

Massachusetts Institute of Technology Cambridge, MA
Visiting Research Scholar (August 2003 - December 2003) and (January 2006 - June 2006)
Mentor: Dr. Isaac L. Chuang, Center for Ultracold Atoms, MIT

University of California, Davis Davis, CA
Bachelors of Arts, Physics (Minor in Mathematics), June 2002

Orange Coast College Costa Mesa, CA
Intersegmental General Education Transfer Curriculum (IGETC), May 2000

RESEARCH INTERESTS

My research interests are grounded in the need to develop balanced architectural models of organization and specialization that will guide the synthesis in developing large-scale computing systems based on emerging nanoelectronic devices. In particular, as a graduate researcher at UC Davis, I have developed a model for a reconfigurable, general-purpose quantum architecture that addresses the primary scalability issues of the use of extensive error correcting networks to decrease reliability to acceptable levels and efficient resource distribution of quantum data. I am a member of the Quantum Computer Architecture Collaboration (QARC), which aims to create an interoperable software tool chain for fault-tolerant quantum computer architecture synthesis and evaluation. QARC is organized by researchers at the University of Washington, UC Berkeley, MIT, UC Davis, and UC Santa Barbara and is funded by DARPA.

PUBLICATIONS

- 1 **BOOK:** Tzvetan S. Metodi and Frederic T. Chong. "Quantum Computing for Computer Architects." *Synthesis Lectures on Computer Architecture*. Editor Mark Hill. 150 pages. Morgan and Claypool Publishers. San Rafael, CA. November 2006.

Refereed Conferences and Journals:

- 2 Tzvetan S. Metodi, Nemanja Isailovich, Darshan D. Thaker, Mark Whitney, Yatish Patel, John D. Kubiawicz and Frederic T. Chong. "Spatial optimization of the classically controlled ion-motion interface in a multiplexed ion-trap quantum computer." To Appear in *SPIE Defense and Security symposium*. Orlando FL. April 2007.
- 3 Tzvetan S. Metodi, Darshan Thaker, Andrew Cross, Frederic T. Chong, and Isaac L. Chuang. "Scheduling Physical Operations in a Quantum Information Processor." In Proc. *SPIE Defense and Security symposium*. Orlando FL. April 2006.
- 4 Darshan D. Thaker, Tzvetan S. Metodi, Andrew Cross, Isaac L. Chuang and Frederic T. Chong. "Quantum Memory Hierarchies: Efficient Designs to Match Available Parallelism in Quantum Computing." In Proc. *International Symposium on Computer Architecture (ISCA)*. Boston, MA. June 2006.

- 5 Darshan D. Thaker, Diana Franklin, John Oliver, Susmit Biswas, Derik Lockhart, Tzvetan S. Metodi and Frederic T. Chong, "Characterization of Error-Tolerant Applications when Protecting Control Data." In Proc. *IEEE International Symposium on Workload Characterization (IISWC)*. San Jose, CA. October 2006.
- 6 Tzvetan S. Metodi, Darshan Thaker, Andrew Cross, Isaac Chuang, and Frederic T. Chong. "A Quantum Logic Array Microarchitecture: Scalable Quantum Data Movement and Computation." In Proc. *International Symposium on Microarchitecture (MICRO)*. December 2005.
- 7 Tzvetan S. Metodi, Darshan Thaker, Andrew Cross, Frederic T. Chong, and Isaac L. Chuang. "A General Purpose Architectural Layout for Arbitrary Quantum Computations." In Proc. *SPIE Defense and Security symposium*. Orlando FL. April 2005.
- 8 Dean Copsey, Mark Oskin, Francois Impens, Tzvetan S. Metodiev, Andrew Cross, Frederic T. Chong, Isaac L. Chuang, John Kubiawicz. "Toward a Scalable Silicon-Based Quantum Computing Architecture." *Selected Topics, Journal of Quantum Electronics*. Volume 9(6). Pages 1552-1569. 2004.
- 9 Dean Copsey, Mark Oskin, Tzvetan S. Metodiev, Frederic T. Chong, and Isaac L. Chuang. "The Effect of Communication Costs in Solid-state Quantum Architectures." In Proc. *Symposium on Parallel Architectures and Applications (SPAA)*. June 2003.

Workshops and Invited Talks:

- 10 Tzvetan S. Metodiev, Andrew Cross, Darshan Thaker, Kenneth Brown, Dean Copsey, Frederic T. Chong, and Isaac Chuang. "Preliminary Results on Simulating a Scalable Fault Tolerant Ion-Trap System for Quantum Computation." In the *3rd workshop on Non-Silicon Computing (NSC-3)*. June 2004.
- 11 Tzvetan S. Metodiev, Dean Copsey, Frederic T. Chong, Isaac Chuang, Mark Oskin, and John Kubiawicz. "A Brief Comparison: Ion-Trap and Silicon-Based Implementations of Quantum Computation." In the *2nd workshop on Non-Silicon Computing (NSC-2)*. June 2003.
- 12 [INVITED TALK:] BBN Technologies, Presented "A Quantum Logic Array Microarchitecture: Scalable Quantum Data Movement and Computation," Cambridge, MA, August 2005.

TEACHING AND RESEARCH EXPERIENCE

- (September 2006 - Present) Visiting Researcher, Computer Science Department, University of California at Santa Barbara, CA. PI: Dr. Frederic T. Chong.
- (November 2006) Guest lecturer in "Extra-Performance Computer Architecture" graduate course at UCSB.
- (September 2002 - Present) Graduate Student Researcher, Department of Computer Science, Computer Architecture Laboratory, University of California at Davis, CA. PI: Dr. Frederic T. Chong.
- (August 2003 - December 2003) and (January 2006 - June 2006) Visiting Research Scholar, Center for Ultracold Atoms, Massachusetts Institute of Technology, Cambridge, MA. PI: Dr. Isaac L. Chuang.
- (Summer 2001, Summer 2002) Advanced Geometry and Algebra Instructor, Christian Brothers High School, Sacramento, CA. Solely responsible for course curriculum, examination, and grading.

PROFESSIONAL EXPERIENCE AND HONORS

- Program Committee member for the Conference On Computing Frontiers, Ischia, Italy, 2007.
- Principal tutorial organizer and presenter at the 39th Annual IEEE/ACM International Symposium on Microarchitecture (**MICRO**). Title: "Quantum Computing for Computer Architects." Orlando, FL. December 2006.
- Peer reviewer for the following conferences and journals: HPCA 2006 (1 paper), JETC 2005 (2 papers), JETC 2006 (2 papers), SPAA 2005 (2 papers), ISCA 2007 (1 paper), TACO 2006 (1 paper)
- Recipient of the Graduate Group of Computer Science Block Grant Student Support Award, offering full financial support during the winter quarter, January - April 2007
- University of California at Davis, Department of Physics Citation (3 given department wide, June 2002)
- Orange Coast College Honors Program Graduate

REFERENCES

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Campus Affiliation

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and Associate Professor of Physics
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