

B.1 Curriculum Vitae

Marc D. Riedel, Ph.D.

Academic Rank

Assistant Professor, Electrical & Computer Engineering
Graduate Faculty, Biomedical Informatics & Computational Biology
University of Minnesota, Twin Cities

Contact Information

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Websites

Main website: <http://tinyurl.com/marc-riedel-group>
Research: <http://tinyurl.com/marc-riedel-research>
Papers: <http://tinyurl.com/marc-riedel-papers>
Teaching: <http://tinyurl.com/marc-riedel-teaching>

EDUCATION

- Postdoctoral Fellow, Computation and Neural Systems, 2004–2005
California Institute of Technology
Funded by the NIH Human Genome Research Institute’s Alpha Project through the Molecular Sciences Institute, Berkeley, CA
- Ph.D., Electrical Engineering, 2004
California Institute of Technology
Dissertation Title: “Cyclic Combinational Circuits”
Advisor: Jehoshua Bruck
Committee: Yaser Abu-Mostafa, Jehoshua Bruck, Ali Hajimiri, Alain Martin, Erik Winfree, and Andrew Viterbi (external from the Viterbi School of Engineering, University of Southern California)

POSITIONS

- Assistant Professor, 2006–present
Electrical and Computer Engineering
University of Minnesota, Twin Cities
- Faculty Member, 2006–present
Digital Technology Center
University of Minnesota, Twin Cities

- Graduate Faculty, 2008–present
Biomedical Informatics and Computational Biology Program
University of Minnesota, Twin Cities
- Lecturer, 2004–2005
Computation and Neural Systems
California Institute of Technology
- Research and Teaching Assistant, 2001–2004
Electrical Engineering
California Institute of Technology

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

- Member, IEEE and IEEE Computer Society
- Member, ACM and ACM Special Interest Group on Design Automation

HONORS AND AWARDS

- **CAREER Award** from the National Science Foundation, 2009–2014.
- Paper titled “The Synthesis of Robust Polynomial Arithmetic with Stochastic Logic” nominated as a **Research Highlight** by Communications of the ACM, 2010.
- Paper titled “The Synthesis of Combinational Logic to Generate Probabilities” nominated for the **IEEE/ACM William J. McCalla Best Paper Award** at the International Conference on Computer-Aided Design (ICCAD), 2009.
- **Charles H. Wilts Prize** for the Best Doctoral Research in Electrical Engineering at Caltech, 2004.
- Paper titled “The Synthesis of Cyclic Combinational Circuits” received the **Best Paper Award** at the Design Automation Conference (DAC), 2003.

RESEARCH FUNDING

For each source, Marc Riedel’s percentage of the total amount is listed in brackets.

External Sponsored Funding

- Agency: National Science Foundation
Program: BIO Computing
Title: “Digital Signal Processing with Biomolecular Reactions”
Investigators: Keshab Parhi (PI) and Marc Riedel (co-PI)
Amount: \$400,000 [50%]
Duration: 2011–2015

- Agency: National Science Foundation
Program: **NSF CAREER Award**
Title: “Computing with Things Small, Wet, and Random – Design Automation for Digital Computation with Nanoscale Technologies and Biological Processes”
Investigator: Marc Riedel (PI)
Amount: \$500,000 [100%]
Duration: 2009–2014
- Agency: National Science Foundation
Program: Design Automation for Micro and Nano Systems, EAGER Grant
Title: “Synthesizing Signal Processing Functions with Biochemical Reactions”
Investigators: Keshab Parhi (PI) and Marc Riedel (co-PI)
Amount: \$200,000 [50%]
Duration: 2009–2011
- Agency: SRC Focus Center Research Program (FCRP)
Program: Functional Engineered Nano-Architectonics (FENA)
Title: “The Concurrent Logical and Physical Design of Nanoscale Digital Circuits”
Investigator: Marc Riedel (PI)
Amount: \$325,000 [100%]
Duration: 2007–2010

University Sources

- Agency: University of Minnesota, Digital Technology Center
Program: Digital Technology Initiatives (DTI) Seed Grant
Title: “Computational Method for Forward Biological Engineering”
Investigators: Y. Kaznessi (PI), C. Schmidt-Dannert (co-PI), and M. Riedel (co-PI)
Amount: \$97,800 [25%]
Duration: 2011–2012
- Agency: University of Minnesota
Program: Biomedical Informatics and Computational Biology (BICB)
Funding: Student Traineeships for Brian Fett and Adrianna Fitzgerald
Investigator: Marc Riedel (PI)
Amount: \$78,000 [100%]
Duration: 2007–2009

PUBLICATIONS AND PRESENTATIONS

A total of 45 peer-reviewed papers:

- Four papers in IEEE Transactions (IEEE Transactions on Computers, IEEE Transactions on CAD of Integrated Circuits & Systems, and IEEE Transactions on Parallel and Distributed Computing)
- Two papers in mathematics journals (Journal of Discrete Applied Mathematics and the European Journal of Combinatorics)

- Three papers in journals with a biology readership (PLoS ONE, the Journal of Systems and Synthetic Biology, and the International Journal of Nanotechnology and Molecular Computation)
- **12 papers** at the **Design Automation Conference** and the **International Conference on Computer-Aided Design**
- A paper at the Asia and South Pacific Design Automation Conference
- A paper at the Allerton Conference on Communication, Control, and Computing
- A paper at the Asilomar Conference on Signals, Systems, and Computers
- Four papers at the Pacific Symposium on Biocomputing
- Two papers at IEEE Symposia (Great Lakes Symposium on VLSI and International Symposium on Quality Electronic Design)
- 11 papers at the International Workshop on Logic and Synthesis
- Two papers at other workshops (IEEE Workshop on Signal Processing Systems and the International Workshop on Synthesis and System Integration of Mixed Information Technologies)
- Two book chapters

For what follows, Marc Riedel’s advisees are denoted with (†). If Marc Riedel was a primary author on the paper, this is indicated with (1); if he was a secondary author, this is indicated with (2).

Peer-Reviewed Journal Articles and Book Chapters

1. “Logic Synthesis for Switching Lattices”
Mustafa Altun[†] and Marc Riedel⁽¹⁾
IEEE Transactions on Computers, 13 pages, to appear, 2011
2. “Characterizing the Memory of the GAL Regulatory Network in *Saccharomyces cerevisiae*”
Vishwesh Kulkarni,[†] Venkatesh Karenhalli, Ganesh Viswanathan, and Marc Riedel⁽¹⁾
Systems and Synthetic Biology, 13 pages, to appear, 2011
3. “Cyclic Boolean Circuits”
Marc Riedel⁽¹⁾ and Jehoshua Bruck
Journal of Discrete Applied Mathematics, 42 pages, to appear (pending minor revision), 2011
4. “Transforming Probabilities with Combinational Logic”
Weikang Qian,[†] Marc Riedel,⁽¹⁾ Hongchao Zhou, and Jehoshua Bruck
IEEE Transactions on CAD of Integrated Circuits & Systems, 14 pages, to appear 2011
5. “Rate-Independent Constructs for Chemical Computation”
Philip Senum[†] and Marc Riedel⁽¹⁾
PLoS ONE, Vol. 6, Issue 6, pp. 1–12, 2011
6. “Uniform Approximation and Bernstein Polynomials with Coefficients in the Unit Interval”
Weikang Qian,[†] Marc Riedel,⁽¹⁾ and Ivo Rosenberg
European Journal of Combinatorics, Vol. 32, No. 3, pp. 448–463, 2011

7. “An Architecture for Fault-Tolerant Computation with Stochastic Logic”
Weikang Qian,[†] Xin Li, Marc Riedel,⁽¹⁾ Kia Bazargan, and David Lilja
IEEE Transactions on Computers, Vol. 60, No. 1, pp. 93–105, 2011
8. “Synthesizing Combinational Logic to Generate Probabilities: Theories and Algorithms”
Weikang Qian,[†] Marc Riedel,⁽¹⁾ Kia Bazargan, and David Lilja
Advanced Techniques in Logic Synthesis, Optimizations and Applications
Sunil Khatri and Kanupriya Gulati, Editors, Springer Publishing, pp. 1–28, 2010
9. “The Synthesis of Stochastic Logic for Nanoscale Digital Circuits”
Weikang Qian,[†] John Backes,[†] and Marc Riedel⁽¹⁾
International Journal of Molecular and Nanoscale Computation
Vol. 1, Issue 4, pp. 39–57, 2010
10. “Computing in the RAIN: A Reliable Array of Independent Nodes”
Vasken Bohossian, Charles Fan, P. LeMahieu, Marc Riedel,⁽¹⁾ Lihao Xu, and Jehoshua Bruck
IEEE Transactions on Parallel and Distributed Computing, Vol. 12, No. 2, pp. 99–114, 2001
11. “Tolerating Faults in Counting Networks”
Marc Riedel⁽¹⁾ and Jehoshua Bruck
Dependable Network Computing, Dimiter Avresky, Editor
Kluwer Academic Publishing, pp. 267–278, 2000

Peer-Reviewed Conference Papers

1. “The Synthesis of Linear Finite State Machine-Based Stochastic Computational Elements”
Peng Li, Weikang Qian,[†] Marc Riedel,⁽²⁾ Kia Bazargan, and David Lilja
ACM/IEEE Asia and South Pacific Design Automation Conference, 8 pages, 2012
2. “Networks of Passive Oscillators”
Vishwesh Kulkarni,[†] Marc Riedel,⁽¹⁾ and Guy-Bart Stan
Allerton Conference on Communication, Control, and Computing, 7 pages, 2011
3. “Asynchronous Sequential Computation with Molecular Reactions”
Hua Jiang,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
Asilomar Conference on Signals, Systems, and Computers, 8 pages, 2011
4. “Synchronous Sequential Computation with Molecular Reactions”
Hua Jiang,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
ACM/IEEE Design Automation Conference, 6 pages, 2011
5. “Rate-Independent Constructs for Chemical Computation”
Philip Senum[†] and Marc Riedel⁽¹⁾
Pacific Symposium on Biocomputing, 11 pages, 2011
6. “Binary Counting with Chemical Reactions”
Aleksandra Kharam,[†] Hua Jiang,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
Pacific Symposium on Biocomputing, 12 pages, 2011
7. “Reduction of Interpolants for Logic Synthesis”
John Backes[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Conference on Computer-Aided Design, 8 pages, 2010

8. “Digital Signal Processing with Biomolecular Reactions”
Hua Jiang,[†] Aleksandra Kharam,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
IEEE/ACM International Conference on Computer-Aided Design, 8 pages, 2010
9. “Lattice-Based Computation of Boolean Functions”
Mustafa Altun[†] and Marc Riedel⁽¹⁾
ACM/IEEE Design Automation Conference, 6 pages, 2010
10. “Writing and Compiling Code into Biochemistry”
Adam Shea,[†] Brian Fett,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
Pacific Symposium on Biocomputing, 9 pages, 2010
11. “The Synthesis of Combinational Logic to Generate Probabilities”
Weikang Qian,[†] Marc Riedel,⁽¹⁾ Kia Bazargan, and David Lilja
IEEE/ACM International Conference on Computer-Aided Design, 8 pages, 2009
(Nominated for **IEEE/ACM William J. McCalla Best Paper Award**)
12. “Synthesizing Sequential Register-Based Computation with Biochemistry”
Adam Shea,[†] Brian Fett,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
IEEE/ACM International Conference on Computer-Aided Design, 8 pages, 2009
13. “Nanoscale Computation Through Percolation”
Mustafa Altun,[†] Marc Riedel,⁽¹⁾ and Claudia Neuhauser
ACM/IEEE Design Automation Conference, WACI Track, 2 pages, 2009
14. “A Reconfigurable Stochastic Architecture for Reliable Computing”
Xin Li, Weikang Qian,[†] Marc Riedel,⁽²⁾ Kia Bazargan, and David Lilja
IEEE Great Lakes Symposium on VLSI Design, 6 pages, 2009
15. “Estimation and Optimization of Reliability of Noisy Digital Circuits”
Satish Sivaswamy, Kia Bazargan, and Marc Riedel⁽²⁾
IEEE International Symposium on Quality Electronic Design, 6 pages, 2009
16. “Stochastic Transient Analysis of Biochemical Systems”
Bin Cheng[†] and Marc Riedel⁽¹⁾
Pacific Symposium on Biocomputing, 11 pages, 2009
17. “Module Locking in Biochemical Synthesis”
Brian Fett[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Conference on Computer-Aided Design, 7 pages, 2008
18. “The Analysis of Cyclic Circuits with Boolean Satisfiability”
John Backes[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Conference on Computer-Aided Design, 7 pages, 2008
19. “The Synthesis of Robust Polynomial Arithmetic with Stochastic Logic”
Weikang Qian[†] and Marc Riedel⁽¹⁾
ACM/IEEE Design Automation Conference, 6 pages, 2008
(Nominated as a **Research Highlight** in Communications of the ACM, 2010)
20. “Synthesizing Stochasticity in Biochemical Systems”
Brian Fett,[†] Jehoshua Bruck, and Marc Riedel⁽¹⁾
ACM/IEEE Design Automation Conference, 6 pages, 2007

21. “The Synthesis of Cyclic Combinational Circuits”
 Marc Riedel⁽¹⁾ and Jehoshua Bruck
ACM/IEEE Design Automation Conference, 6 pages, 2003
 (Received the **DAC Best Paper Award**)

Peer-Reviewed Workshop Papers

1. “Resolution Proofs as a Data Structure for Logic Synthesis”
 John Backes[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2011
2. “Synthesizing Cubes to Satisfy a Given Intersection Pattern”
 Weikang Qian[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2010
3. “Two-Level Logic Synthesis for Probabilistic Computation”
 Weikang Qian[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2010
4. “Reduction of Interpolants for Logic Synthesis”
 John Backes[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 6 pages, 2010
5. “Digital Signal Processing with Biomolecular Reactions”
 Hua Jiang,[†] Aleksandra Kharam,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
IEEE Workshop on Signal Processing Systems, 6 pages, 2010
6. “The Synthesis of Cyclic Dependencies with Craig Interpolation”
 John Backes[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 7 pages, 2009
7. “Synthesizing Sequential Register-Based Computation with Biochemistry”
 Adam Shea,[†] Brian Fett,[†] Marc Riedel,⁽¹⁾ and Keshab Parhi
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2009
8. “The Synthesis of Combinational Logic to Generate Probabilities”
 Weikang Qian,[†] Marc Riedel,⁽¹⁾ Kia Bazargan, and David Lilja
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2009
9. “The Synthesis of Stochastic Logic to Perform Multivariate Polynomial Arithmetic”
 Weikang Qian[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2008
10. “The Synthesis of Stochastic Logic for Nanoscale Digital Circuits”
 Weikang Qian,[†] John Backes,[†] and Marc Riedel⁽¹⁾
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2007
11. “Application of LUT Cascades to Numerical Function Generators”
 Tsutomu Sasao, Jon Butler, and Marc Riedel⁽¹⁾
Workshop on Synthesis & System Integration of Mixed Information, 7 pages, 2004

12. “Timing Analysis of Cyclic Combinational Circuits”
Marc Riedel⁽¹⁾ and Jehoshua Bruck
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2004
13. “Cyclic Combinational Circuits: Analysis for Synthesis”
Marc Riedel⁽¹⁾ and Jehoshua Bruck
IEEE/ACM International Workshop on Logic and Synthesis, 8 pages, 2003

Patents

1. “Method and Means for the Synthesis of Cyclic Combinational Circuits”
Marc Riedel and Jehoshua Bruck
U.S. Patent 7,249,341
2. “A Reliable Array of Distributed Computing Nodes”
Vincent Bohossian, Charles Fan, Paul LeMahieu, Marc Riedel, Lihao Xu, and Jehoshua Bruck
U.S. Patent 6,128,277

For what follows, the presenter is indicated with (*). In all cases, the presenter is Marc Riedel or one of his advisees.

Presentations with Published Abstracts

1. “Synthesizing Logical Computation on Stochastic Bit Streams for Sensing Applications”
Marc Riedel* (**invited**)
IEEE CANDE Workshop, San Jose, CA, 2011
2. “Digital Signal Processing with DNA”
Hua Jiang,* Marc Riedel, and Keshab Parhi
International Conference on DNA Computing, Pasadena, CA, 2011
3. “Synthesizing Logical Computation on Stochastic Bit Streams”
Marc Riedel* (**invited**)
CMOS Emerging Technologies Workshop, Whistler, BC, 2011
4. “Asynchronous Sequential Computation with Molecular Reactions”
Hua Jiang,* Marc Riedel, and Keshab Parhi
International Workshop on Bio-Design Automation, San Diego, CA, 2011
5. “Biological Network Reconstruction Using Literature Curated and High Throughput Data”
Vishwesh Kulkarni,* Kalyanasundaram Subramanian, Reza Arastoo,
Mayuresh Kothare, and Marc Riedel
International Workshop on Bio-Design Automation, San Diego, CA, 2011
6. “Rate-Independent Constructs for DNA Computing”
Philip Senum and Marc Riedel*
Annual Institute of Biological Engineering Conference, Atlanta, GA, 2011
7. “Lattice-Based Computation with Percolation”
Mustafa Altun and Marc Riedel* (**invited**)
IEEE/ACM International Symposium on Nanoscale Architectures, Anaheim, CA, 2010

8. “Signal Processing Functions with Biomolecular Reactions”
Hua Jiang, Marc Riedel,* and Keshab Parhi
International Workshop on Bio-Design Automation, Anaheim, CA, 2010
9. Session Summary: “Engineering Biology: Fundamentals and Applications”
Marc Riedel,* Soha Hassoun, and Ron Weiss (**invited**)
ACM/IEEE Design Automation Conference, Anaheim, CA, 2010
10. “Digital Signal Processing with Biochemistry”
Marc Riedel* (**invited**)
Symposium on the Foundations of Nanoscience, Salt Lake City, UT, 2010
11. “Iterative Computation with Biomolecular Reactions”
Hua Jiang, Marc Riedel,* and Keshab Parhi
Annual Institute of Biological Engineering Conference, Boston, MA, 2010
12. “Stochastic Logic and Stochastic Biological Processes”
Marc Riedel* (**invited**)
Information Theory and Applications Workshop, UC San Diego, 2010
13. “Computing with Things Small, Wet, and Random”
Marc Riedel* (**invited**)
IEEE CANDE Workshop, Monterey, CA, 2009
14. “Stochastic Chemical Reaction Networks”
Marc Riedel* (**invited**)
International Workshop on Stochasticity, Banff, Alberta, 2009
15. “Synthesizing Sequential Register-Based Computation with Biochemistry”
Adam Shea, Brian Fett, Marc Riedel,* and Keshab Parhi
International Workshop on Bio-Design Automation, San Francisco, CA, 2009
16. “Synthesizing Circuit Constructs with Chemical Reaction Networks”
Marc Riedel* (**invited**)
Emergence in Chemical Systems Conference, Anchorage, AK, 2009
17. “Rate-Independent Biochemical Synthesis”
Adam Shea, Brian Fett, and Marc Riedel*
Annual Institute of Biological Engineering Conference, Santa Clara, CA, 2009
18. “Modular Stochastic Biochemistry”
Brian Fett and Marc Riedel*
Synthetic Biology 4.0, Hong Kong, 2008
19. “Biochemical Pathways from Generic Designs”
Brian Fett and Marc Riedel*
Synthesis of Cells Meeting, Kobe, Japan, 2008
20. “The Computer-Aided Synthesis of Stochastic Biochemistry”
Brian Fett and Marc Riedel*
Advances in Synthetic Biology Conference, Cambridge, UK, 2008

21. “Synthesizing Stochasticity”
Brian Fett and Marc Riedel*
Synthetic Biology 3.0, Zürich, Switzerland, 2007
22. “Using The Probability Gradient to Analyze Bifurcating Biochemical Systems”
Brian Fett* and Marc Riedel
International Conference on Systems Biology, Yokohama, Japan, 2006
23. “Exact Stochastic Simulation with Event Leaping”
Marc Riedel* and Jehoshua Bruck
International Conference on Systems Biology, Boston, MA, 2005

Invited Talks, Colloquia, and Panels (without published abstracts)

1. “Random and Loopy Circuits: Complexity in Electronic and Biological Circuit Design”
Dept. of Defense Research and Engineering Complex Systems Study
Host: Robert Bond
Squam Lake, NH, July 27, 2010
2. Panelist: “CAD for Nanoelectronic Circuits and Architectures – Are We There Yet?”
IEEE/ACM International Symposium on Nanoscale Architectures
Organizer: Prof. Garrett Rose
Anaheim, CA, June 17, 2010
3. “Robust Stochastic Computation with Biomolecular Reactions”
NSF Workshop on Shared Organizing Principles in Biology
Organizer: Prof. Melanie Mitchel
Arlington, VA, May 25, 2010
4. “Computing with Things Small, Wet, and Random”
Biological and Medical Physics Seminar Series
Host: Prof. Vincent Noireaux
University of Minnesota, March 30, 2010
5. “Computing with Things Small, Wet, and Random”
Computer Science Seminar
Host: Prof. Soha Hassoun
Tufts University, March 1, 2010
6. Tutorial: “Programming Constructs for Chemical Reaction Networks”
Pacific Symposium on Biocomputing
Organizer: Dr. Gil Alterovitz
Kona, Hawaii, Jan. 7, 2010
7. “Computing with Things Small, Wet, and Random”
Electrical and Computer Engineering Seminar
Host: Prof. Azadeh Davoodi
University of Wisconsin, Feb. 27, 2009

8. “Computing with Things Small, Wet, and Random”
Electrical and Computer Engineering Seminar
Host: Prof. Lin Zhong
Rice University, Feb. 17, 2009
9. “Computing with Things Small, Wet, and Random”
Electrical and Computer Engineering Seminar
Host: Prof. Anxiao (Andrew) Jiang
Texas A&M University, Feb. 17, 2009
10. “Synthesizing Nearly Rate Independent Biochemical Computation”
NSF Expeditions in Computing – Molecular Programming Workshop
Organizer: Prof. Erik Winfree
Oxnard, CA, Jan. 10, 2009
11. “Computing with Things Small, Wet, and Random”
Electrical and Computer Engineering Seminar
Host: Prof. Rick Kiehl
UC Davis, Sep. 29, 2008
12. “Synthesizing Stochastic Logic”
SRC Center on Functional Engineered Nano-Architectonics (FENA) Annual Meeting
Organizer: Prof. Kang Wang
La Jolla, CA, June 13, 2008
13. Tutorial: “Synthesizing Stochastic Biochemical Reactions”
Tech Tune Up
Organizer: Prof. Ahmed Tewfik
University of Minnesota, May 26, 2008
14. “Synthesizing Stochasticity in Circuits and in Biology”
DARPA MTO LIBRA Workshop
Organizer: Dr. John Damoulakis
Arlington, VA, Nov. 29, 2007
15. Public Lecture: “Circuit Engineers Doing Biology –
A Discourse on the Changing Landscape of Scientific Research”
Café Scientifique Public Seminar Series, Bell Museum of Natural History
Organizer: Peggy Korsmo-Kennon
Bryant-Lake Bowl, Minneapolis, MN, Nov. 20, 2007
16. “High-Performance Computing for the Analysis and Synthesis of Biochemistry”
IBM Company Seminar
Host: Tim Mullins
Rochester, MN, Oct. 8, 2007
17. Guest Lecture: “Molecular Computing”
IST 4, Information and Logic
Instructor: Prof. Jehoshua Bruck
California Institute of Technology, May 25, 2007

18. “Analysis and Synthesis of Biochemical Reactions”
Cadence Research Labs Seminar
Host: Dr. Andreas Kuelmann
Berkeley, CA, May 24, 2007
19. Tutorial: “Analysis and Synthesis of Stochastic Biochemical Reactions”
Tech Tune Up
Organizer: Prof. Kia Bazargan
University of Minnesota, May 23, 2007
20. “Analysis and Synthesis of Stochastic Logic for Nanoscale Computation”
SRC Center on Functional Engineered Nano-Architectonics (FENA) Workshop
Organizer: Prof. Kang Wang
UCLA, April 19, 2007
21. “Synthesizing Stochasticity in Biochemical Reaction Networks”
Mathematical Biology Seminar
Host: Prof. Hans Othmer
University of Minnesota, March 21, 2007
22. “Exact Stochastic Simulation with Event Leaping”
Mathematical Biology Seminar
Host: Prof. Hans Othmer
University of Minnesota, Nov. 2, 2006
23. “Cycles – The Good and the Bad in Logic Synthesis and Computational Biology”
Medtronic Technology Quarterly Seminar
Host: Sara Audet
Fridely, MN, Oct. 5, 2006
24. “Cycles – The Good and the Bad in Logic Synthesis and Computational Biology”
Electrical Engineering Seminar
Host: Prof. Mustafa Kamash
UC Santa Barbara, May 17, 2006

TEACHING

Lecture-Based Courses

- EE 1301, “Introduction to Computing Systems”
Fall 2009, Spring 2010, Fall 2010, and Fall 2011
- EE 2301, “Introduction to Digital System Design”
Spring 2007, Spring 2008, and Spring 2009
- EE 5393, “Circuits, Computation, and Biology ”
Spring 2008, Fall 2008, and Spring 2011
- EE 5950, “Special Topics in Electrical and Computer Engineering”
Fall 2006

Discussion Sections

- EE 2301, “Introduction to Digital System Design”
Fall 2006, Fall 2007, Fall 2008, Fall 2009, and Fall 2010
- EE 2361, “Introduction to Microcontrollers”
Fall 2011

Project-Based Courses

- IT 1311, “Freshman Design”
Fall 2006
- EE 2361, “Senior Design”
Spring 2008, Spring 2009, and Fall 2011

Curriculum Development

- Developed a new course, EE 5393, “Circuits, Computation, and Biology,” Spring 2008
- Developed a new set of laboratory experiments for EE 1301, “Introduction to Computing Systems,” Fall 2009
- Updated the laboratory experiments for EE 2301, “Introduction to Digital System Design,” Summer 2011

ADVISING AND MENTORING

Undergraduate Students

- Directed Undergraduate Research Opportunities Program (UROP) projects for: John Backes (2008), Adam Shea (2008), Phil Greenberg (2009), Dan Hudrlik (2009), Kathleen Thurmes (2009), Aleksandra Kharam (2010), Joshua Krist (2010), Phillip Senum (2010), Jing Xiong (2010), and Nick Gunderson (2011)
- Directed Senior Honors projects for: Jason Heebl (2006–2007), Tim Pankratz (2006–2007), John Kablan (2008–2009), John Backes (2008–2009), Phil Greenberg (2010–2011), Caitlin Race (2010–2011), and Theerachai Chanyaswad (2011–2012)

Master’s Theses Directed

- Brian Fett (2006–2008)
Thesis title: “Synthesizing Stochasticity with Biochemical Reactions”
- Bin Cheng (2007–2008)
Thesis title: “Stochastic Transient Analysis of Biochemical Systems”

Doctoral Dissertations Directed

- Weikang Qian (2006–2011)
 - Dissertation title: “Synthesizing Logical Computation on Stochastic Bit Streams”
 - Received a **Doctoral Dissertation Award**, 2010
 - Has accepted a tenure-track faculty position as an Assistant Professor at the University of Michigan – Shanghai Jiao Tong University Joint Institute (SJTU), starting in September, 2011

Doctoral Students Advised

- Weikang Qian (2006–2011)
- Mustafa Altun (2008–)
- John Backes (2009–)
- Hua Jiang (2009–)
Jointly advised with Keshab Parhi

Degree Committees

- Ph.D. Final Committee for:
Shuo Guo (EE), Na Hyung Kim (EE), Robert Knuesel (EE), Sanjay Kumar (EE), Qunzeng Liu (EE), Pongstorn Maidee (EE), Andrew Ness (EE), Weikang Qian (EE), and Satish Sivaswamy (EE)
- Ph.D. Preliminary Committee for:
Mustafa Altun (EE), John Backes (EE), Baktash Boghrati (EE), Jianxin Fang (EE), Chenjie Gu (EE), Shuo Guo (EE), Sakeet Gupta (EE), Robert Knuesel (EE), Sanjay Kumar (EE), Peng Li (EE), Qunzeng Liu (EE), Pongstorn Maidee (EE), Weikang Qian (EE), Jonghyeon Shin (Physics), Satish Sivaswamy (EE), Bennett Swiniarski (CEMS), Jing Wang (EE), Chi Xu (EE), and En Yuan (EE)
- M.S. Committee for:
Amit Bose (CS), David Boutcher (EE), Bin Chen (EE), Wuyang Dai (EE), Brian Fett (EE), Andrew Ness (EE), and Bennett Swiniarski (CEMS)

Visiting Scholars Hosted

- Vishwesh Kulkarni (2011–)
 - Funded through Marc Riedel’s NSF CAREER Award.
 - Applied for a position as a Postdoctoral Fellow with Marc Riedel. Given his previous position as an Assistant Professor at the Indian Institute of Technology, Bombay, he has been given the title “Visiting Research Professor” in ECE at the University of Minnesota.

PROFESSIONAL SERVICE

Paper Refereeing

- Nature Reviews Microbiology (2011)
- Proceedings of the National Academy of Sciences (2010)
- IEEE Transactions on Computers (2007, 2010, and 2011)
- IEEE Transactions on Computer-Aided Design of Circuits and Systems (2007, 2008, and 2011)
- IEEE Transactions on Information Theory (2010)
- ACM Transactions on Design Automation of Electronic Systems (2010)
- ACM Journal on Emerging Technologies (2007)
- Bioinformatics (2007)
- Journal of Chemical Physics (2007)
- SIAM Journal on Scientific Computing (2006)

Conference and Workshop Technical Program Committees

- DAC International Workshop on Bio-Design Automation (2009–)
- ACM/IEEE Design Automation Conference (2011)
- IEEE Great Lakes Symposium on VLSI (2009–2010)
- IEEE International Workshop on Genomic Signal Processing and Statistics (2009)
- IEEE/ACM International Conference on Computer-Aided Design (2008)
- IEEE/ACM International Workshop on Logic and Synthesis (2006–)

Review Panels

- Served on review panel for the National Science Foundation's Software and Hardware Foundations Cluster CAREER Award (2009 and 2010)

Workshop Organization

- DAC International Workshop on Bio-Design Automation (IWBDA)
 - Initiated Workshop in 2009
 - Steering Committee Chair (2009–)
 - General Chair (2010)
 - Technical Program Chair (2009)

Workshop attendance: **100 people** 2009, **85 people** in 2010, and **120 people** in 2011

- IEEE/ACM International Workshop on Logic and Synthesis (IWLS)
 - Program Chair (2009)
 - General Chair (2008)
 - Publications Chair (2007)
 - Panel Chair (2006)

- IEEE International Workshop on Genomic Signal Processing and Statistics
 - Finance Chair (2009)

Professional Interest Groups

- ACM Special Interest Group on Design Automation (SIGDA)
 - Associate Editor of SIGDA Newsletter (2006–)
 - Co-chair of Technical Committee on Logic/RTL Design (2006–2009)
 - Vice-Chair of CAD-athlon Programming Competition (2006–2007)

SERVICE TO THE UNIVERSITY OF MINNESOTA

University-Wide

- Interdisciplinary Informatics Seed Grant Program Review Panel (2009)

Electrical and Computer Engineering Department

- Member of Student Services and Advising Committee (2011–)
- Member of Graduate Committee (2006–2011)

Biomedical Informatics and Computational Biology Program

- Member of Admissions Committee (2008–2009)