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# Marc D. Riedel

## Research Interests

Logic Synthesis and Verification, Novel Platforms for Computation, Systems Biology, Bioinformatics, Neural Systems, Asynchronous Circuits

## Education

California Institute of Technology, Pasadena, CA

Postdoctoral Fellow [2004 – present]

Ph.D., *Electrical Engineering* [2004]

M.Sc., *Electrical Engineering* [1997]

- Doctoral Dissertation: “Cyclic Combinational Circuits”
- **Charles H. Wilts Prize** for the best dissertation in Electrical Engineering
- Committee: Yaser Abu-Mostafa, Jehoshua Bruck (*advisor*), Ali Hajimiri, Alain Martin, Erik Winfree, and Andrew Viterbi

McGill University, Montreal, Canada

B.Eng., *Electrical Engineering* [1995]

- Minor in Mathematics
- Scholarships: J.W. McConnell, Desjardins, Canada, NSERC, and FCAR
- Honors Thesis: “Fault Coverage Analysis of Semiconductor Memory Test Algorithms” (*advisor* Janusz Rajski)

## Publications

### Refereed Papers

- “The Synthesis of Cyclic Combinational Circuits”  
Marc Riedel and Jehoshua Bruck,  
*Design Automation Conference* [2003].  
Received the **Best Paper Award**.
- “Timing Analysis of Cyclic Combinational Circuits”  
Marc Riedel and Jehoshua Bruck,  
*International Workshop on Logic and Synthesis* [2004].
- “Cyclic Combinational Circuits: Analysis for Synthesis”  
Marc Riedel and Jehoshua Bruck,  
*International Workshop on Logic and Synthesis* [2003].
- “Application of LUT Cascades to Numerical Function Generators”  
Tsutomu Sasao, Jon Butler, and Marc Riedel,  
*Workshop on Synthesis & System Integration of Mixed Information Technologies* [2004].
- “Computing in the RAIN: A Reliable Array of Independent Nodes”  
V. Bohossian, C. Fan, P. LeMahieu, M. Riedel, L. Xu, and J. Bruck,  
*IEEE Transactions on Parallel and Distributed Computing* [2001].

## Publications (cont.)

- “Tolerating Faults in Counting Networks”  
Marc Riedel and Jehoshua Bruck,  
*International Workshop on Dependable Network Computing* [1998].
- “Fault Coverage Analysis of RAM Test Algorithms”  
Marc Riedel and Janusz Rajski,  
*International VLSI Test Symposium* [1995].

## In Preparation

- “The Synthesis of Cyclic Combinational Circuits”  
Marc Riedel and Jehoshua Bruck,  
to be submitted to *IEEE Transactions on Computers*.
- “The Complexity of Cyclic Circuits”  
Marc Riedel, Jehoshua Bruck, and John Savage,  
to be submitted to *SIAM Journal on Computing*.

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## Patents

- “Method and Means for the Synthesis of Cyclic Combinational Circuits”  
Marc Riedel and Jehoshua Bruck,  
U.S. Patent *pending* [Dec. 6, 2003].
- “A Reliable Array of Distributed Computing Nodes”  
V. Bohossian, C. Fan, P. LeMahieu, M. Riedel, L. Xu, and J. Bruck,  
U.S. Patent 6,128,277 [Oct. 3, 2000].

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## Teaching/Professional

Caltech Course CS/EE 188, Computation Theory and Neural Systems

- **Instructor** [2003-2005], Teaching Assistant [2001-2003]  
Graduate-level course on computational models for neural/biological systems.

International Workshop on Logic and Synthesis

- Member of Technical Program Committee [2005].

Reviewer for numerous technical journals and conferences:

- IEEE Transactions (Computers, Parallel & Distributed Systems, Information Theory), IPDPS, FTCS, etc.

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## Industry

Fujitsu Laboratories, Kawasaki, Japan [1993]

- Research Internship, *Neural Networks Group, Intelligent Systems Laboratory*  
Devised a novel algorithm for combinatorial optimization with Hopfield neural networks.

Toshiba Systems Center, Fuchu, Japan [1991, 1992]

- Student Researcher, *Vision Group, Engineering Automation Section*  
Developed an object recognition algorithm for an automated subway platform monitoring system.

CAE Electronics, Montreal, Canada [1989, 1990]

- Programmer Analyst, *Nuclear Simulations Dept.*  
Coded control modules for a real-time simulation model of a nuclear power plant.

Marconi Canada, Montreal, Canada [1989]

- Student Intern, *Avionics Division*  
Structured a database for avionics expenditures.

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## References

- 1) Jehoshua Bruck  
*Gordon and Betty Moore Professor of Electrical Engineering,  
Director of the Information Science and Technology Program*  
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- 2) Ali Hajimiri  
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- 5) Andrew Viterbi  
*Presidential Chair Professor*  
Viterbi School of Engineering  
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