

MARIAM MOMENZADEH

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Research Interests

- Test and Design for Testability of Circuits and Systems
- Nanotechnology (Quantum-dot Cellular Automata, QCA): Design, Test, Fault-Tolerance
- Jitter Modeling and Characterization of ATE Systems
- Fault-Tolerant Design and Fault-Tolerant Parallel Algorithms
- Distributed and Parallel Computing

Education

NORTHEASTERN UNIVERSITY Boston, MA
Ph.D. in Computer Engineering, Minor Electrical Engineering 2006
GPA:3.96/4.0

Advisor: Professor Fabrizio Lombardi

- Dissertation: Defect Tolerance of QCA Systems at Nano-Scale.

UNIVERSITY OF CONNECTICUT Storrs, CT
Master of Science in Computer Science and Engineering. 2003
GPA:3.74/4.0

Advisor: Professor Alex A. Shvartsman

- Thesis: Emulating Shared-Memory Do-All in Asynchronous Message Passing Systems.

SHARIF UNIVERSITY OF TECHNOLOGY Tehran, Iran
Bachelor of Science in Electrical Engineering. 1999

- Thesis: A 3-Phase Digital Multitransducer based on an 80751 Microcontroller.

Work Experience

NORTHEASTERN UNIVERSITY ECE Department 1/03-5/06

Teaching Assistant.

Courses: Digital Logic Design, Computer Architecture and Organization, Electrical Engineering I, Numerical Methods, Engineering Problem Solving with Software Applications
Conducted problem review sessions, prepared and graded problem sets and exams.

Research Assistant.

Performed research in defect and fault tolerant issues in nanotechnologies.

- Defect characterization of Quantum Cellular-dot Automata (QCA) and fault tolerant techniques for QCA. Developed novel schemes for testability in QCA-based designs.
- Developed novel QCA-based designs.

LTX CORPORATION Westwood, Massachusetts

Northeastern University Research Assistant.

Performed ATE-based scan test and optimization scheduling, jitter modeling and characterization of ATE systems.

UNIVERSITY OF CONNECTICUT CSE Department 9/00- 12/02

Teaching Assistant.

• Courses: Computer Organization and its Laboratory, Microprocessor Laboratory
Conducted recitation and problem review sessions, prepared and graded problem sets and exams, and monitored lab assignments.

Projects example: a multi-threaded time-sharing program in order to explore the PowerPC memory access synchronization primitives.

Research Assistant.

Designed, analyzed, and implemented a Do-All algorithm on asynchronous message passing environment.

UNIVERSITY OF CONNECTICUT School of Business, Executive MBA. Summer 01&02
Graduate Assistant.

Performed maintenance and troubleshooting of the school's computer facilities.

- Researched market share information of various financial institutions across US and Europe.
- Developed new client database, resulting in increased productivity.

IRAN PHOSPHATE COMPANY Tehran, Iran 6/99- 7/00
Electrical Engineering Intern. Technical Design Section.

• Programmed and calibrated various sensory systems in the factory site, and supervised their functionality.

SHARIF UNIVERSITY OF TECHNOLOGY EE Department 11/97- 5/98
Undergraduate Researcher.

• Designed and developed a remote central patient monitoring system using 8086 microprocessor and RS-232 interface.

Honors/Awards

- ASTE/NEPCON Test Engineering National Scholarship, 2003.
- Northeastern University Graduate Research Award, 2003- 2006.
- University of Connecticut Graduate Research Award, 2000- 2002.
- Ranked among top 0.1% of participants in the nationwide university entrance exam for B.Sc. degree, 1994.

Professional Memberships and Activities

- IEEE Member
 - IEEE Society of Women Engineers
- Reviewer for
- Integration, the VLSI Journal
 - IEEE Design and Test of Computers Magazine
 - IEEE Transactions on Computers
 - IEEE VLSI Test Symposium (VTS)

List of Archival Journal Publications

J1. M. Momenzadeh, J. Huang and F. Lombardi, "Analysis of Missing and Additional Cell Defects in Sequential Quantum-Dot Cellular Automata," accepted, to appear in Integration the VLSI Journal 2007.

J2. M. Momenzadeh, J. Huang, L. Schiano, M. Ottavi, and F. Lombardi, "Tile-Based QCA Design Using Majority-Like Logic Primitives," accepted, to appear in ACM Journal on Emerging Technologies in Computing Systems , vol. 1, no. 3, pp.163-185, 2006.

J3. L. Schiano, M. Momenzadeh, F. Zhang, Y. J. Lee, T. Kane, S. Max, P. Perkins, Y-B. Kim, F. Lombardi and F. J. Meyer, "Measuring the Timing Jitter of ATE in the Frequency Domain," IEEE Transactions on Instrumentation and Measurement, vol. 55, issue 1, pp. 280-289, 2006.

J4. M. Momenzadeh, J. Huang, M.B. Tahoori and F. Lombardi, "On the Evaluation of Scaling of QCA Devices in the Presence of Defects at Manufacturing," IEEE Transactions on Nanotechnology, vol. 4, issue 6, pp. 740 – 743, 2005.

J5. M. Momenzadeh, J. Huang, M.B. Tahoori and .F. Lombardi, "Characterization, Test and Logic Synthesis of And-Or-Inv (AOI) Gate Design for QCA Implementation," IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), vol. 24, issue 12, pp. 1881-1893, 2005.

J6. M.B. Tahoori, M. Momenzadeh, J. Huang and F. Lombardi, "Testing of Quantum Cellular Automata," IEEE Transactions on Nanotechnology, vol. 3, issue 4, pp. 432-442, 2004.

List of Articles in Refereed Conference Proceedings

C1. M. Momenzadeh, J. Huang and F. Lombardi, "Defect Tolerance of QCA Tiles", IEEE Design, Automation and Test in Europe Conference (DATE), vol. 1, pp. 1-6, 2006.

C2. M. Momenzadeh, M. Ottavi and F. Lombardi "Modeling QCA Defects at Molecular-level in Combinational Circuits," IEEE International Symposium on Defect and Fault Tolerance in VLSI Systems (DFT), pp. 208-216, 2005.

C3. M. Momenzadeh, J. Huang and F. Lombardi, "Defect Characterization and Tolerance of QCA Sequential Devices and Circuits," IEEE International Symposium on Defect and Fault Tolerance in VLSI Systems (DFT), pp. 199-207, 2005.

C4. J. Huang, M. Momenzadeh, L. Schiano and F. Lombardi, "Simulation-based Design of Modular QCA Circuits," IEEE Conference on Nanotechnology, Paper WE-P7-1, IEEE CD-ROM 05TH8816C, 2005.

C5. J. Huang, M. Momenzadeh, M.B. Tahoori and F. Lombardi, "Design and Characterization of an And-Or-Inverter (AOI) Gate for QCA Implementation," ACM Great Lakes Symposium on VLSI, pp. 426-429, 2004.

C6. M. Momenzadeh, M.B. Tahoori, J. Huang and F. Lombardi, "Quantum Cellular Automata: New Defects and Faults for New Devices," International Parallel and Distributed Processing Symposium (IPDPS), pp. 207-214, 2004.

C7. L. Schiano, M. Momenzadeh, F. Zhang, Y. Lee, Y-B; Kim, F. Lombardi, F.J. Meyer, T. Kane, S. Max and P. Perkins, "Frequency domain measurement of timing jitter in ATE," IEEE Instrumentation and Measurement Technology Conference, vol.3, pp. 2150-2155, 2004.

C8. M.B. Tahoori, M. Momenzadeh, J. Huang and F. Lombardi, "Defects and Fault Characterization in Quantum Cellular Automata," Nanotechnology Conference, vol. 3, pp.190-193, 2004.

C9. J. Huang, M. Momenzadeh, M.B. Tahoori and F. Lombardi, "Defect Characterization for Scaling of QCA Devices," IEEE Symposium on Defect and Fault Tolerance in VLSI Systems (DFT), pp. 30-38, 2004.

C10. M.B. Tahoori, M. Momenzadeh, J. Huang and F. Lombardi, "Defects and Faults in Quantum Cellular Automata at Nano Scale," IEEE VLSI Test Symposium (VTS), pp. 291-296, 2004.

C11. F. Zhang, Y.J. Lee, T. Kane, L. Schiano, M. Momenzadeh, Y.B. Kim, F. J. Meyer, F. Lombardi, S. Max and P. Perkinson, "A Digital and Wide Power Bandwidth H-Field Generator for Automatic Test Equipment ," IEEE Symposium on Defect and Fault Tolerance in VLSI Systems (DFT), pp. 159-166, 2003.

C12. D.R. Kowalski, M. Momenzadeh and A.A. Shvartsman, "Emulating Shared-Memory Do-All Algorithms in Asynchronous Message-Passing Systems," International Conference On Principles of Distributed Systems, Springer -LNCS series, pp. 210-222, 2003.

List of Submitted Papers for Journal Publication

1. M. Momenzadeh, J. Huang, N. Park and F. Lombardi, "Computing with Grids of QCA Cells," submitted to IEEE Transactions on Circuits and Systems II.
2. M. Momenzadeh, M. Ottavi and F. Lombardi, "Analysis of Deposition Defects in QCA Molecular Devices and Circuits," submitted to IEEE Transactions on Nanotechnology.
3. J. Huang, M. Momenzadeh, and F. Lombardi, "An Overview of Devices and Circuits at Nano Scale," submitted to IEEE Design & Test of Computers Magazine.
4. M. Momenzadeh, J. Huang and F. Lombardi, "Design of Sequential Circuits by Quantum-dot Cellular Automata," submitted to Microelectronics Journal.

Selected Graduate Courses Taken at Northeastern University

- Advance Test Seminar
- Testing and Design for Testability
- Digital Systems Design and Interfacing with Verilog
- Analog Integrated Circuit Designs
- Combinatorial Optimization

Selected Graduate Courses Taken at University of Connecticut

- Fault-Tolerant Parallel Computing
- Parallel Systems
- Advanced Sequential and Parallel Algorithms
- Theory of Computation
- Probabilistic Methods
- Introduction to Modern Analysis

Technical Skills

- Hardware description languages: Verilog, VHDL
- Programming languages: Assembly, Pascal, C++, UNIX Script
- Operating systems: Windows, Unix, Linux
- Engineering applications: Spice, Tanner Tools, Orcad, Synopsis Design Compiler, Synopsis Tetramax, Modelsim, Matlab, Active HDL
- Applications: L^AT_EX, MS Office, UNIX/Linux application programs

Professional References

1. Dr. Fabrizio Lombardi,
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Electrical & Computer Eng. Dept.
Northeastern University.
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2. Dr. Alexander A. Shvartsman,
Associate Professor
Computer Science & Engineering Dept.
University of Connecticut.
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3. Dr. Mehdi B. Tahoori,
Assistant Professor
Electrical & Computer Eng. Dept.
Northeastern University
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