Daniela Staiculescu, Ph.D.

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Keywords:
RF/microwave packaging, multilayer compact systems, optimization techniques, RFID systems, composite materials, metamaterials.

Summary:
RF/Microwave Packaging researcher with expertise in design and optimization of complex packaging systems in various technologies. Extensive experience in multilayer technologies and interconnects, up to millimeter-wave frequencies.
Most recent work includes hybrid statistical/electromagnetic optimization techniques, metamaterials, RFID systems, novel composite materials. In the academic environment experience with obtaining and leading research projects, manage the research group, professional activities and extensive technical presentation and documentation writing experience.

Work experience:

- Research Engineer, Georgia Institute of Technology, Atlanta, GA, 2003 – present.
- Senior Design Engineer, RF Solutions, Atlanta, GA, 2001 – 2003.
- Graduate Research Assistant, Georgia Institute of Technology, Atlanta, GA, 1996 – 2001.
- Engineering Intern, Lucent Technologies, Princeton, NJ, 1998, 1999.
- Design Engineer, Electronica Industriala, Bucharest, Romania, 1993 – 1996.

Skills and research interests:
CAD software: Advanced Design System (ADS), High Frequency Structure Simulator (HFSS), Microstripes, IE3D, Thermal Analysis System (TAS), Autocad.
Measurements skills: HP8510C network analyzer calibration and on-wafer measurements.
Scientific software: Matlab, JMP.
Management/academic skills: Extensive experience with technical presentations and documentation writing; research activity coordination, student advising and class teaching; professional activities.
Current research interests: Novel materials, RFID systems including sensors and batteries integration, bio-medical applications.
Languages: English (fluent), Romanian (native), French (reading), Spanish (reading).

Education:
Ph.D. in Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, 2001.
M.S. Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, 1999.
B.S. Electrical Engineering, Polytechnic Institute, Bucharest, Romania, 1993.

Project experience:

Research Engineer, Georgia Institute of Technology, Atlanta, GA, 2003 – present.

- **Research activities:**
    - Investigate design and optimization techniques for compact 3D modules and systems using statistical and electromagnetic tools;
    - Investigate characteristics and applications of metamaterials for RF and microwave packaging;
    - Investigate novel materials like magnetic composites, liquid crystal polymer (LCP) and paper for RF applications like RFIDs, filters, baluns and antennas;
    - Manage a complex project on modeling, optimization, fabrication and testing of complex radar manifold transitions on LCP for military applications; to be completed with great results at the end of 2007;
    - New RFID system implementation project kickoff in a car-auctioning environment. The goal is locating cars in the auctioning site, which extends over 200 acres and handles over 180,000 vehicles every year. The goal is minimizing the system cost and work will include reader choice and placement, tag design and placement, as well as the communication system.
- **Leadership:**
    - Manage and advise Graduate Research Assistants, teach classes, lead group meetings; active member of the Georgia Electronic Design Center at Georgia Tech;
    - Represent the group and the University at the most prestigious international conferences. Extensive experience with technical presentations;
    - Manage international FIPSE-EU funded student exchange programs with successive hostings of students from Europe in our lab;
    - Main organizer of the 2005 Computational Electromagnetics in Time-Domain (CEM-TD) Workshop in Atlanta, GA, followed by guest editing a special issue of the International Journal of Numerical Modeling extending the papers presented at the workshop;
    - Various professional activities including conferences and journal publications.

Senior Design Engineer, RF Solutions, Atlanta, GA, 2001 – 2003.

- **Design and modeling:**
    - Solved the packaging related issues for all the design engineers; developed models for specific packages and wirebond configurations;
    - Solved thermal related issues for all the power amplifiers. This includes setup of reliable thermal simulations and solutions to improve the thermal performance from chip level to package and board level. Also performed custom thermal simulations for customers' specific needs;
    - IC design: switches, power amplifiers;
    - Front End module feasibility study and preliminary design.

Graduate Research Assistant, Georgia Institute of Technology, Atlanta, GA, 1996 – 2001.

- Investigated solutions for RF packaging;
- Ph.D. Thesis: "Design Rules for RF and Microwave Flip Chip".

Engineering Intern, Lucent Technologies, Princeton, NJ, 1998, 1999.

- Investigated the effect of Ni-Au surface finish on microstrip conductive losses;
- Surveyed all the available commercial electromagnetic simulators.

Design Engineer, Electronica Industriala, Bucharest, Romania, 1993 – 1996.

- Designed waveguide systems for satellite applications.

Professional service:

- Interactive Forum Chair and Technical Program Committee member for the 2008 International Microwave Symposium, Atlanta, GA.
- Session chair for 2008 Applied Computational Electromagnetics Symposium, Niagara Falls, Canada.
- Reviewer for journals:
  - IEEE Transactions on Microwave Theory and Techniques;
  - IEEE Transactions on Antennas and Propagation;
  - IEEE Transactions on Components, Packaging and Manufacturing Technologies.

Citizenship:

US Citizen.

References:

Available by request.

Publications:

Journal:

- D. Staiculescu, N. Bushyager, A. Obatoyinbo, L. Martin, M.M. Tentzeris, *"Design and Optimization of 3D Compact Stripline and Microstrip Bluetooth/WLAN Balun Architectures using the Deisgn of Experiments Technique"*, IEEE Transactions on Antennas and Propagation, May 2005.
- R.J. Pratap, S. Pinel, D. Staiculescu, J. Laskar, G. May, *"Modeling and Sensitivity Analysis of Circuit Parameters for Flip-Chip Interconnects Using Neural Networks"*, IEEE Transactions on Advanced Packaging, Feb.2005.
- S. Pinel, M.M.Tentzeris, D.Staiculescu, K.Lim and J.Laskar, *"RF/Wireless Packaging"*, Invited Chapter for the book: ``Encyclopedia of RF and Microwave Engineering", edited by K.Cheng, to be published by Wiley Eds., May 2004.
- D.Staiculescu, J.Laskar and M.M.Tentzeris, *"Design of Experiments (DOE) Technique for Microwave/Millimeter Wave Flip Chip Optimization"*, International Journal of Numerical Modeling, Vol.16, pp.97-103, 2003.
- D. Staiculescu, A. Sutono, J. Laskar, *"Wideband Scaleable Electrical Model for Microwave/Millimeter Wave Flip-chip Interconnects"*, IEEE Advanced Packaging Transactions, September 2001, pp. 255-259.
- D. Staiculescu, J. Laskar, M. Tentzeris – *"Design rule development for microwave flip chip applications"*, IEEE MTT Transactions, vol. 48, No. 9, September 2000, pp. 1476-1481.
- D. Staiculescu, K.Lim, A.Sutono, H.Liang, M.Tentzeris and J.Laskar, *"Flip Chip vs. Wirebond"*, Printed Circuit Design Magazine, June 2002.

Selected Conference:

- L. Martin, D. Staiculescu, H. Li, S.L. Ooi, C.P. Wong, M. M. Tentzeris, "Investigation of the Impact of Magnetic Permeability and Loss of Magnetic Composite Materials on RFID and RF Passives Miniaturization", 2007 CEM-TD Workshop, October 2007.
- F. Placentino, D. Staiculescu, S. Nikolaou, L. Martin, A. Scarponi, F. Alimenti, L. Roselli, M.M. Tentzeris, *"Concurrent Circuit-Level/System-Level Optimization of a 24 GHz Mixer for Automotive Applications Using a Hybrid Electromagnetic/Statistical Technique"*, 2007 IEEE IMS Symposium, June 2007.
- D. Staiculescu, L. Martin, M. M. Tentzeris, *"Performance Capability Modeling And Optimization Of RF/Millimeter Wave Integrated Functions And Modules Using A Hybrid Statistical/Electromagnetic Technique That Includes Process Variations"*, 2006 IEEE European Microwave Conference, September 2006.

- C. You, D. Staiculescu, L. Martin, W. Hwang, M.M. Tentzeris, *"Efficient co-design of composite smart structures (antennas and mechanical structures) using a novel hybrid optimization technique",* 2006 Antenna and Propagation Symposium, July 2006.
- D. Staiculescu, C. You, L. Martin, W. Hwang M.M. Tentzeris, *"Hybrid Electrical/Mechanical Optimization Technique Using Time-Domain Modeling, Finite Element Method and Statistical Tools for Composite Smart Structures"*, 2006 IMS Symposium, San Francisco, CA, June 2006.
- D. Staiculescu, M.M. Tentzeris*, "Hybrid Optimization Techniques Including Deterministic Electromagnetic Simulators and Statistical Tools"*, 2006 ACES Symposium, Miami, FL, March 2006.
- D. Staiculescu, L.Martin, M.M. Tentzeris, *"3D Integrated Metamaterials for System on a Package (SOP) Applications"*, 2005 Mediterranean Microwave Conference, Athens, Greece, September 2005.
- L.J.Martin, D.Staiculescu and M.M.Tentzeris, *"Design and Optimization of 3D Multilayer Balun Architectures Using the Design of Experiments Technique"* , 2005 IEEE-APS Symposium, July 2005.
- D.Staiculescu, N.Bushyager, L.Martin and M.M.Tentzeris, *"Design of Millimeter-Wave Metamaterials Using Deterministic Full-Wave Electromagnetic Simulators and Patch of Ascent Statistical Optimizer",* 2005 IEEE-ECTC Symposium, June 2005.
- N.Vasiloglou, D.Staiculescu and M.M.Tentzeris, *"Investigation of the Effect of Fractal Shapes on the Broadband Behavior of One-Dimensional Optimized Antennas"*, 2004 URSI Symposium, June 2004.
- N.Bushyager, D.Staiculescu, L.Martin, J.-H.Lee, N.Vasiloglou and M.M.Tentzeris, *"Design and Optimization of 3D RF Modules, Microsystems and Packages Using Electromagnetic and Statistical Tools"*, IEEE ECTC Symposium, June 2004.
- N.Bushyager, D.Staiculescu, A.Obatoyinbo and M.M.Tentzeris, *"Optimization of 3D Multilayer RF Components using the Design of Experiments (DOE) Technique"*, 2004 IEEE IMS Symposium, June 2004
- R.J. Pratap, S. Pinel, D. Staiculescu, J. Laskar, G. May, *"A neural network model for sensitivity analysis of circuit parameters for flip chip interconnects"*, 2003 Electronic Components and Technology Conference, May 2003,
- J. Laskar, A. Sutono, D. Staiculescu, C-H. Lee, M.F. Davis, K. Lim, M.Tentzeris, *"Multi-layer 3D System-on-Package (SOP) Architectures for Highly Integrated Microwave and Millimeter Wave Radio Front-end",* International Conference on Surface Mount Technology, September 2001.
- D. Staiculescu, J. Laskar, M. Tentzeris, *"Flip-chip Design Rule Development for Multiple Signal and Ground Bump Configurations"*, 2000 Asia Pacific Conference, December 3-6.
- D. Staiculescu, A. Sutono, J. Laskar – *"Wideband Scaleable Electrical Model for Microwave/Millimeter Wave Flip Chip Interconnects"*, 2000 IEEE EPEP Topical Meeting, October 2000.
- B. McGarvey, D. Staiculescu, M. Tentzeris, J. Laskar – *"Adaptive modeling of complex packaging using Haar Wavelets"* –2000 European Microwave Conference.
- M. Tentzeris, D. Staiculescu, G. Cafaro, J. Laskar – "*Design and optimization of novel RF packaging structures using multi resolution and statistical schemes,* 2000 PIERS Conference, July 2000.
- D. Staiculescu, J. Laskar, J. Mather – *"Design rule development for microwave flip chip applications"* – presented at the 1999 IEEE EPEP Topical Meeting – San Diego, CA – October 25 – 27 1999, pp.231-234
- D. Staiculescu, J. Laskar, J. Mendelsohn, E. Sweetman, D. Rudy, I Artaki – *"Ni-Au surface finish effects on RF performance"* –1999 IEEE IMS Symposium, June1999.
- D. Staiculescu, H. Liang, J. Laskar, J. Mather – *" Full wave analysis and development of circuit models for flip-chip interconnects"* – 1998 IEEE EPEP Topical Meeting, Ocotber 1998.
- D. Staiculescu, A. Pham, J. Laskar, S. Consolazio and S. Moghe - *"Analysis and Performance of BGA Interconnects for RF Packaging"*- 1998 IEEE RFIC Symposium, June 1998.
- J. Laskar, N. Jokerst, M. Brooke, M. Harris, C. Chun, A. Pham, H. Liang, D. Staiculescu, A. Sutono – *"Review of packaging research at Georgia Tech's PRC"* – 1998 IEEE International Symposium and Exhibition on Advanced Packaging Materials Processes, Properties and Interfaces , March 1998.

Invention disclosure:

- *"Radial Multiple Ground Bump Configurations"*, with Joy Laskar, patent No. US 6,624,521 B2, Sep. 23, 2003