Chris DeMarco

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OBJECTIVE

To secure a challenging position in ASIC design, including architectural formulation, logic-level synthesis, FPGA modeling with Verilog/VHDL, digital, analog, or mixed-signal circuit design, and VLSI IC layout and verification.

EDUCATION

North Carolina State University, Raleigh NC

Ph.D. in Computer Engineering	May 2003 (pending)
Master of Science in Computer Engineering	December 1996
Bachelor of Science in Computer Engineering	December 1994

Summa Cum Laude graduate, GPA 3.89

Special Honors: Highest Computer Engineering graduate in the December 1994 class.

University Appointments:

Research Assistant: Lead microchip VLSI and prototype design for a retinal prosthesis (1998-2000)
Research Assistant: Studied reconfigurable computing using FPGA's (1997-1998)
Research Assistant: Developed a medical computer vision software application (1996-1997)
Teaching Assistant: Lead the robotics and intelligent systems laboratory (1994-1996)

EXPERIENCE

IBM Corporation, Raleigh NC **May 2001 to June 2002**
Advisory Engineer

As Advisory Engineer on the circuits team of IBM's PowerPC Embedded Processor Solutions, performed custom circuit design (including dynamic logic) for low power, high-speed embedded processors. Also conducted studies of transmission line effects in global clock distribution interconnect.

North Carolina State University, Raleigh NC **1998 to 2000**
Research Assistant, Retinal Prosthesis Project

Conducted research work in the areas of analog/digital/mixed-mode circuit design, VLSI, FPGA's (Field Programmable Gate Arrays), and computer vision/image-processing applicable to retina prosthesis development. Project is a joint research effort between ophthalmologists/surgeons and researchers at Johns Hopkins University and electrical engineers/researchers at North Carolina State University. The goal is the development of a chronic retina-prosthesis implant to restore some vision to people who are blind due to outer-retinal degeneration cause primarily by the two diseases Retinitis Pigmentosa and Age-Related Macular degeneration.

TECHNICAL / COMPUTER SKILLS

Digital system architectural formulation and behavioral modeling and simulation (Verilog, VHDL)
FPGA-based rapid-prototyping in Verilog/VHDL (Altera CPLD/FPGA tools)
Logic-level synthesis (Synopsys)
Digital/analog designs at transistor level, circuit simulation (Hspice, Spectre)
IC layout, verification, DRC/LVS, and fabrication (Cadence Design Tools)
C programming and X-Windows/MS-Windows programming (X/Xlib, MFC)
Java programming for standalone applications and internet E-commerce
Web development experience using HTML, Coldfusion, Java, Javascript, XML, SQL, and MySQL

ACADEMICS

Software Coursework:
Compilers
Data Structures
Neural Networks/Neural Control
Fuzzy logic/Fuzzy Control
Software Engineering
Operating Systems
Pascal, C, C++, MSVisual C++, Linux X/Xlib
Computer Vision
Computer Graphics
Multimedia
Numerical Electromagnetics

Hardware Coursework:
VLSI system design/VLSI layout
Digital Electronics
Analog Electronics
ASIC Design
Piplelined/Superscalar CPU design
Parallel Computer Architecture
Logic testing and Testability
Digital Control Systems
Analog Control Systems
Switchmode DC-DC converters
Robotics

SELECTED PUBLICATIONS

Refereed Journal Papers

[1] S.C. DeMarco, G. Lazzi, W. Liu, J.D. Weiland, and M.S. Humayun. "Computed SAR and Thermal Elevation in a 0.25mm 2D Model of the Human Eye and Head in Response to an Implanted Retinal Stimulator. Part I: Models and Methods." Accepted and to be printed in *IEEE Transactions on Antennas and Propagation.*

[2] G. Lazzi, S.C. DeMarco, W. Liu, J.D. Weiland, and M.S. Humayun. "Computed SAR and Thermal Elevation in a 0.25mm 2D Model of the Human Eye and Head in Response to an Implanted Retinal Stimulator. Part II: Results." Accepted and to be printed in *IEEE Transactions on Antennas and Propagation.*

[3] S.C. DeMarco, P.R. Singh, W. Liu, G. Lazzi, M.S. Humayun, and J.D. Weiland. "A Multi-Bias Digital-to-Analog Converter for Use in Bio-Implantable Neuro-Stimulators." Accepted by *IEEE Journal of Solid State Circuits.*

[4] S.C. DeMarco, M. Clements, P.R. Singh, W. Liu, M.S. Humayun, and J.D. Weiland. "A 60 Channel, Implantable Neuro-Stimulator for an Epi-Retinal Visual Prosthesis." Submitted to *IEEE Transactions on VLSI.*

[5] W. Liu, K. Vichienchom, M. Clements, S.C. DeMarco, D. Hughes, E. McGucken, M.S. Humayun, E. De Juan, J.D. Weiland, and R. Greenberg. "A Neuro-Stimulus Chip with Telemetry Unit for Retinal Prosthetic Device." *IEEE Journal of Solid State Circuits*, 35(10):1287-1497, October 2000.

Conference Papers

[6] G. Lazzi, W. Liu, S.C. DeMarco, K. Gosalia, M. Eberdt, J. Weiland, M. Humayun, "Computational Electromagnetics for a Retinal Prosthesis to Restore the Sight in the Blind," (Invited) 2002 IEEE Antennas and Propagation International Symposium and URSI North American Radio Science Meeting, San Antonio, TX, June 2002.

[7] S.C. DeMarco, G. Lazzi, W. Liu, M. Humayun, and J. Weiland "Computed Heating in Head/Eye Model Containing an Implantable Retinal Stimulator Microchip," BMES 2001 Symposium, Durham, Sept. 2001.

[8] G. Lazzi, S. C. DeMarco, W. Liu, M. Humayun, "Simulated Temperature Increase in a Head/Eye model containing an Intraocular Retinal Prosthesis," 2001 IEEE Antennas and Propagation International Symposium and URSI North American Radio Science Meeting, Boston, MA, July 2001.

[9] W. Liu, G. Lazzi, C. DeMarco, M. Humayun, J. Weiland, "Safety Assessment of the Retinal Prosthesis System: Electromagnetics and Thermal Energy Deposition," ARVO Proceedings, Florida, 2001.

[10] G. Lazzi, S.C. DeMarco, W. Liu, and M. Humayun. "Simulated Temperature Increase in a Head/Eye Model Containing an Intraocular Retinal Prosthesis." *IEEE International symposium on Antennas and Propagation*, 2:72-75, 2001.

[11] M. Clements, K. Vichienchom, W. Liu, C. Hughes, E. McGucken, C. DeMarco, J. Mueller, M. Humayun, E. De Juan, J. Weiland, and R. Greenberg. "An Implantable Power and Data Receiver and Neuro-Stimulus Chip for a Retinal Prosthesis System." Proceedings of the 1999 *IEEE International Symposium on Circuits and Systems*, 1:194-197, 1999.

[12] M. Clements, k. Vichienchom, W. Liu, C. Hughes, E. McGucken, C. DeMarco, J. Mueller, M. Humayun, E. De Juan, J. Weiland, and R. Greenberg. "An Implantable Neuro-Stimulator Device for a Retinal Prosthesis." *IEEE International Solid State Circuits Conference Digest of Technical Papers*, pages 216-217, 1999.

[13] W. Liu, E. McGucken, K. Vichienchom, S.M. Clements, S.C. DeMarco, M. Humayun, E. De Juan, J. Weiland, and R. Greenberg. "Retinal Prosthesis to Aid the Visually Impaired." *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, 4:364-369, 1999.

[14] S.C. DeMarco, M. Clements, K. Vichienchom., W. Liu, m. Humayun, and J. Weiland. "An Epi-Retinal Visual Prosthesis Implementation." *Proceedings of the First Joint BMES/EMBS Conference*, 1:475, 1999.

Book Chapters

[15] W. Liu, E. McGucken, R. Cavin, M. Clements, K. Vichienchom, C. DeMarco, M. Humayun, E. De Juan, Jr., J. Weiland, and R. Greenberg, editors. *Intelligent Systems and Technologies in Rehabilitation Engineering*, "Chapter 2: A retinal prosthesis to benefit the visually impaired," pages 31-92.CRC Press LLC, Boca Raton, Florida, 2001.

COMMUNITY / VOLUNTEER WORK

Colonial Baptist Church, Usher/Head Usher	1995 to present
AWANA Children's Ministry, Leader	1998 to 2000