

Curriculum Vitae
DAVID AARON WINICK
(919)844-0733
9724 Erinsbrook Drive
Raleigh, NC 27613

EDUCATION:

TEACHING Experience, NORTH CAROLINA STATE UNIVERSITY, to present.

New course development and instruction: *Design of MEMS and Microsystems (ECE591B)*.
Attracted students from several engineering disciplines, and filled all available seats.

Assistantships: *Digital Computer Technology and Design*, and *Artificial Intelligence*
graduate-level courses. Organized course projects, and graded work.

PhD RESEARCH Assistantship, Ctr. for Advanced Computing and Communication.

Design and application of MEMS technology for reconfigurable, high-speed signal routing, in
both the optical and electrical interconnection domains, airborne LIDAR beam-steering and
high-definition adaptive optics.

Designed, fabricated, simulated, and tested several research chip layouts. Developed arrayable
bistable phase reflector. Currently constructing simulation code, in C++, for design and
optimization of these systems.

MS CPE, School of Engineering, NORTH CAROLINA STATE UNIVERSITY, May 1994.

Coursework: VLSI Design, Superscalar Microprocessor Design, Computer Communications,
Parallel Architectures, Fuzzy Logic and Artificial Neural Networks, Operating Systems
Principles, File Organization and Processing.

BS CPE, School of Engineering, NORTH CAROLINA STATE UNIVERSITY, December 1991.

Digital Systems Interfacing, AI & Expert Systems, Microprocessor Design, Elements of Control,
Design of Complex Digital Systems, Computer Organization and Microprocessors, Data
Structures, Real Time Control Management. Senior design project: Worked with NCSU
Libraries in interfacing CD-ROM reference databases to the existing engineering and inter-library
computer networks.

Co-op: Over two years engineering industry experience.

EXPERIENCE:

Computer Engineering Co-op, IBM NETWORK ROUTER SYSTEMS, RTP, NC.

Debugged, reworked, and assembled processor engine cards and backplanes for prototype
routers. Performed system administration and maintenance of a local network of R6000's.
Evaluated portions of ExpressV-HDL as a possible site-wide EDA tool. Assisted in AUSSIM
simulation and logic verification of the department's chip and board designs.

December, 1992 - August, 1993.

EOS Computer Lab Operator, NCSU ELECTRICAL & COMPUTER ENGINEERING DEPT., Raleigh, NC.

Administered aid to DECstation, PC, and VAX users in the Department's computing facilities. Maintained an atmosphere conducive to computing. Made available reference materials.

August, 1991 - December, 1992.

Computer Engineering Co-op, NORTHERN TELECOM (400 PPK), Morrisville, NC.

Prototyped, modified, and tested circuit packs and daughterboards for the DMS-10 400E rural switch. Programmed PLD's and ROM's using CUPL and CSIM languages. Assisted engineers in circuit debugging and documentation.

Programmed Apollo Domain Computer Workstation and IBM System 370. Designed, coded, and maintained software tools for the DMS-10 product Technology division.

Specialized skills include proficient use of C, Pascal, and PL/I languages under UNIX, AEGIS, and VM/CMS operating system environments.

May - August, 1990; January - May, August - December, 1989.

HONORS AND ACTIVITIES:

Leader of NCSU design team entry, "Monolithic Copper Integrated Circuitry supporting Multi-layer MEMS", to SRC Copper IC Design Challenge. Invited into Phase-II competition.

Motorola Fellow (1995 Motorola Inc./IEEE CPMT Graduate Fellowship in Electronics Packaging).

Eta Kappa Nu, Upsilon Pi Epsilon, Cum Laude graduate, NCSU Academic Dean's List.

Member of IEEE and SPIE professional societies.

Avid bicyclist, and soaring pilot.

PAPERS PUBLISHED:

"Monolithic Copper Integrated Circuitry Supporting Multi-Layer MEMS." B. Duewer, A. Glaser, D. Nackashi, J. Wilson, and D. Winick. Presented at SRC TECHCON 2000, Special Session: SRC Copper Design Challenge (Pub P001093). Phoenix, AZ, September 2000. Semiconductor Research Corporation.

"Methodology for Design of Electrostatic MEMS Devices using the SUMMiT Process." Bruce Duewer, David Winick, John Wilson, Jeremy Palmer, and P. D. Franzon. In 45th IIS, Surface Micromachining Application. Albuquerque, NM, May 1999. Instrument Society of America and Industrial Computing Society.

"MEMS-based capacitor arrays for programmable interconnect and RF applications." B. E. Duewer, J. M. Wilson, D. A. Winick, and P. D. Franzon. In 29th Conference on Advanced Research in VLSI, Atlanta, GA, March 1999. The Institute of Electrical and Electronics Engineers.

"Tunable MEMS Capacitor Arrays." J. M. Wilson, B. E. Duewer, D. A. Winick, and P. D. Franzon. In 3rd Annual Wireless Communications Conference, pages 111-115. San Diego, CA, November 1998. International Microelectronics and Packaging Society.

"MEMS-Based Diffractive Optical Beam Steering Technology." David A. Winick, Bruce E. Duewer, John M. Wilson, S. Palchadhury, John C. Tucker, and Paul D. Franzon. In Miniaturized Systems with Microoptics and Micromechanics III. San Jose, CA, January 1998. SPIE.

"Performance evaluation of micromechanical binary phase-only holographic optical elements." David A. Winick, Bruce E. Duewer, S. Palchadhury, and Paul D. Franzon. In 47th Electronic Components and Technology Conference, pages 419-424. San Jose, CA, May 1997. Components, Hybrids, and Manufacturing

Technology Society, IEEE.

"A micro-machined approach to optical interconnect." David A. Winick, W. Michael Teague, and Paul Franzon. In 45th Electronic Components and Technology Conference, pages 780-785. Las Vegas, NV, May 1995. Components, Hybrids, and Manufacturing Technology Society, IEEE.

"Case study: Automatic VHDL generation using ExpressV-HDL." Ken Martin, Darrell Wolfe, Mark McCool, Chris Durham, S. L. Vanderlinden, and David Winick. In Proceedings of the Electronic Design Automation Interdivisional Technical Liaison Meeting, Poughkeepsie, NY, April 1993.

PAPERS IN PROGRESS:

"VLSI Design Styles Applied to MEMS Design." David Winick, Bruce Duewer, John Wilson, Krutarth Mehta, and Paul Franzon. Submitted / in process to Special Issue of IEEE Design and Test of Computers: MEMS Design and Test.

"Development and Characterization of a Multi-level Surface Release Process for 0.12 micron Copper Technology".

"Dual-damascene Copper as the Foundary-based Solution to implementing Smart Microsystems."

"Reducing I/O Constraints in MEMS Array Designs."

"Two-beam Microinterferometry for CCD-based lambda/100 Precision Area Tomography."

"Why the likelihood of a timely graduation remains a mysterious illusion."

Summary of PhD research:

My PhD work is in the design and application of micro-electro-mechanical systems (MEMS) for dynamic optical signal modulation. I have developed micromirror elements during this research, using standard micromachining processes, and organized them into large two-dimensional arrays. In arrayed form these elements act to impart a phase-mostly modulation function on an incident optical wavefront. Unique properties of the micromachined implementation offer several opportunities for insertion into new applications, such as high-speed and precision beamsteering, adaptive optical signal routing for computer interconnect, and portable display generation. In addition to exploring these applications, my study includes the development of a generalized strategy and CAD tool extensions for MEMS design, as well as innovative methods for array control and for optical inspection. My hope is that suitability of MEMS to optical applications, in combination with its strong ties to the chip fabrication industry, will drive a generation of low cost electro-optical components into the mainstream.

Name: David Winick
Address: 9724 Erinsbrook Drive, Raleigh, NC 27613
E-mail: david_winick@ncsu.edu
University: North Carolina State University
Department: Department of Electrical and Computer Engineering (ECE)
Position: PhD student, expected graduation 12/00.
Residency: US Citizen
