

Curriculum Vitae

Nathaniel J. Davis IV, Ph.D.
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Biographical Information

College Level Education

Ph.D. (Electrical Engineering), 1985, Purdue University, West Lafayette, Indiana. Period attended: 1982-1985.

M.S. (Electrical Engineering), 1977, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Period attended: 1976-1977.

B.S. (Electrical Engineering), 1976, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Period attended: 1972-1976.

Academic Employment

August 2005 – Present:

Professor and Head, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Responsible for the academic and research direction as well as the administration of the 38-faculty department.

August 1989 – August 2005:

Professor, Bradley Department of Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Tenure granted in 1995. Promoted to Professor in 2002.

- Assistant Department Head 2000 – 2004. Responsible for the academic programs within the department and the department's 850 undergraduate and 600 graduate students. These responsibilities included program assessment activities (ABET), course scheduling (approximately 300 course sections per year), instructor assignments, supervision and guidance of the department's graduate and undergraduate counselors, resolution of admissions review disputes, and resolution of student complaints.

September 1985 - August 1989:

Assistant Professor, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. Selected for promotion to the rank of Associate Professor (with tenure), to have been effective October 1, 1989.

April 1988 - December 1988:

Adjunct Assistant Professor, Department of Computer Science and Engineering, Wright State University, Dayton, Ohio.

March 1981 - July 1982:

Instructor, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio.

Professional Non-Academic Employment Experience

August 1989 – February 2000:

Lieutenant Colonel, U. S. Army Reserve Individual Mobilization Augmentation Program; assigned to the CECOM Night Vision and Electro-optics Laboratory, Fort Belvoir Virginia as a Research and Development Coordinator. During annual two-week summer training periods, assisted in the development of land mine training simulators compatible with other MILES simulators, provided a critical assessment of the next-generation soldier environmental support system, led the development of neural network parallel computer systems for land mine detection and classification, and provided technical support for humanitarian demining operations. Transferred to the Retired Reserve in February 2000.

June 1977 - August 1989:

Commissioned Officer in the United States Army Signal Corps. Attained the rank of Major. In addition to the academic experience noted above, active duty assignments included:

August 1982 - August 1985:

Doctoral student, Purdue University. Attended school under an Army fellowship program.

June 1977 - June 1980:

Assigned to the XVIII Corps (Airborne), Fort Bragg, North Carolina as a communications-electronics officer. Directed the employment of a 65-soldier communications platoon. Led efforts in the planning, the installation, and the operation of UHF and microwave communication systems for ten company and battalion field training exercises. Provided direct administrative assistance to the Commander, 35th Signal Brigade (Corps) (Airborne), a 3,000-soldier tactical Signal Corps brigade.

June 1976 - May 1977:

Master's Degree student and Graduate Teaching Assistant, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

Scholarly Activities

Teaching Experience

I have taught a wide-range of electrical and computer engineering courses. The focus of these courses has been on the design and use of computer systems. In each of these courses, major subsystems of a computer's architecture were explored and design alternatives were investigated. Sophomore-level courses provided a broad-based introduction to the computer engineering field while the more advanced courses dealt with state-of-the-art and emerging computer architectures, to include computer architecture, high-performance uniprocessors, massively parallel processing systems, computers embedded within larger systems, distributed computing systems, and computer-communications networks.

Thesis, Dissertation, and Project Advising:

Undergraduate Research Projects:

Alexander Kourakas

Project title: "Using the MC68HC11 Microcontroller." Completed as part of the Engineering Fundamentals course EF 1006, Introduction to Engineering, Spring 1994 semester.

Elvin L. Taylor, Jr.

Project title: "Design of a Queueing Model Based on an FDDI Network." Completed under the National Science Foundation Research Experience for Undergraduates program while attending Virginia Tech during the 1993 summer sessions. Mr. Taylor was a rising senior at the time of the project. He later completed his MS program at Virginia Tech as a recipient of an NSF graduate fellowship.

Project title: "Design and construction of two micro satellites to be launched as part of the space shuttle's hitchhiker program." This independent study research project supported a team of 4-8 undergraduate students during the Spring 99 – Spring 01 semesters. The goal of the project was to specify and design the on-board flight computer for HokieSat, a USAF/NASA-sponsored microsatellite constructed in the Aerospace and Ocean Engineering Department.

Theresa Nelson and Almohanad Fayeze

Project title: "Laboratory Development for ENGE 1104, Exploring the Digital Future." This project was done in the Summer 2004 semesters and was supported in part by an NSF curriculum development grant. The project focused on the development of course material for ENGE 1104. ENGE 1104 was a new course that was to be taught for the first time by the Engineering Education Department in the Spring 2005 semester. EE, CPE, and CS freshmen were required to take the course. Nelson and Fayeze developed course materials, MATLAB manuals, and 2 years of laboratory experiments for use in the course. These materials were solicited from ECE by the ENGE Department.

Master's Degree Students:

From the Air Force Institute of Technology

Barry A. Carpenter

December, 1987. Thesis Title: "Implementation and Performance Analysis of Parallel Assignment Algorithms on a Hypercube Computer." Initial employer: United States Air Force with post-graduation assignment as a computer engineer, Air Force Operational Test and Evaluation Center, Edwards Air Force Base, California.

Wayne C. DeLoria

December, 1987. Thesis Title: "A Digital Logic Simulator with Concurrent Programming Considerations." Initial employer: United States Army with post-graduation assignment as a communications-electronics staff officer, United States Army Installation Systems Engineering Command, Fort Huachuca, Arizona.

Richard A. Raines

December, 1987. Thesis Title: "The Modeling, Simulation and Comparison of Interconnection Networks for Parallel Processing." Initial employer: United States Air Force with post-graduation assignment as the computer engineer, National Training Center/Air Warrior Air Combat Maneuvering Instrumentation System, United States Air Force Aeronautical Systems Division, Systems Command, Eglin Air Force Base, Florida.

William J. Shaw

March 1988. Thesis Title: "Electronic Intelligence Support to Theater/Tactical Military Operations: An Evaluation of the Collection Management Process." Initial employer: United States Air Force with post-graduation assignment as a computer engineer, National Security Agency, Fort Meade, Maryland.

David L. Mannix

December, 1988. Thesis Title: "Distributed Discrete-Event Simulation Using Variants of the Chandy-Misra Algorithm on the Intel Hypercube." Initial employer: United States Air Force with post-graduation assignment as a software engineer, 6545th Test Group, Hill Air Force Base, Utah.

From Virginia Polytechnic Institute and State University

Kurt R. Schaubach

August 1992. Thesis Title: "Microcellular Radio Channel Prediction Using Ray Tracing." Initial employer: Southwest Bell Technology Resources, Inc., St. Louis, Missouri.

Vishwanathan Ramachandran

August 1992. Thesis Title: "Performance Analysis of Augmented Shuffle Exchange Networks." Initial employer: Vertex Semiconductors, Inc., San Jose, California.

Manjula Rajan

August 1992. MS Project Title: "Performance Enhancement of Wireless Indoor Communication Systems Using Pedestrian Traffic Modeling." Initial employer: U. S. West Advanced Technologies, Inc., Bolder, Colorado.

Minuti Sahu

August 1992. MS Project Title: "A Study on Neural Networks and Some Applications." Continued her studies as a Ph.D. student at the University of Texas at Austin.

Shannon E. Lawson

January 1993. Thesis Title: "Distributed Reconfiguration and Fault Diagnosis in Cellular Processing Arrays." Initial employer: Motorola Semiconductor Products, Austin, Texas.

Kimy Loka

September 1993. MS Project Title: "Performance Evaluation of Packet-Switched Multistage Cube Interconnection Networks." Initial employment unknown (returned to home country).

Patricia A. Jedrzewski

January 1994. MS Project Title: "A Comparison of the Globalstar and Iridium Satellite Communications Proposals." Initial employer: Motorola Semiconductor Products, Austin, Texas.

Jahng S. Park

February, 1994. Thesis Title: "Performance Analysis of Partitioned Multistage Cube Network and Adaptive Routed Single-Stage Cube Network." Currently a post-doctoral researcher at Virginia Tech.

Daniel A. Hess

May 1994. MS Project Title: "Analysis of the Two-Level Cache Structure." Initial employment unknown.

Vikrampal Chadha

September 1994. Thesis Title: "Simulation of Large-Scale System-Level Models." Initial employer: Computing Staff, Virginia Tech Library System.

Matthew S. Kurtin

August 1996. Thesis Title: "Verification and Implementation of a Multiple Retransmission Technique for a One-way Asynchronous Communication Channel." Initial employer: Triad Performance Technologies, Inc., Farmington Hills, MI.

Henry Green

May 1996. Thesis Title: "IVDS Consumer Control Unit Evolution and Bar Code Interface Design." Initial employer: Intranga, Blacksburg, VA.

Todd Goodde

March 1997. Thesis Title: "Decoder Board Hardware/Software Development in Wireless Interactive Video Data Service System." Initial employer: Hill-Rohm, Cincinnati, OH.

Steven Franks

December 1997. Thesis Title: "IVDS System: Channel Simulation and Repeater Unit Design." Initial employer: Intel Corporation, Folsom, CA.

Aaron Hawes

December 1997. Thesis Title: "The Design of an IVDS World Wide Web Browser Architecture." Initial employer: Intel Corporation.

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