Dr. Russ Duren

Associate Professor
Dept. of Electrical and Computer Engineering
Baylor University
One Bear Place, #97356
Waco, Texas 76798
254-710-4197
russell_duren@baylor.edu

Education

- Ph.D. in Electrical Engineering, Southern Methodist University, Dallas, TX, 1991
- M.S. in Electrical Engineering, Southern Methodist University, Dallas, TX, 1986
- B.S. in Electrical Engineering, University of Oklahoma, Norman, OK, 1978

Professional Experience

Associate Professor, August 2003 – Present
Department of Electrical and Computer Engineering, Baylor University, Waco, TX

Teach and perform research in the areas of avionics systems engineering; digital design with HDLs (Verilog and VHDL) and HLLs (C-based and others), embedded systems design; FPGAs; and computer architecture, high performance computing and reconfigurable computing.

Accomplishments:
- Developed a FPGA-based reconfigurable computing cluster platform and ported the Linux operating system to the system. This system is being used to performed research into reconfigurable computing architectures, performance, and programming methods.
- Developed and characterized the performance of multiple circuits to explore the application of reconfigurable computing techniques to radar and sonar processing problems. Some of these applications have achieved speedups of 60 to 200 times over conventional solutions.
- Developed and delivered multiple VHDL circuit designs, including a SDRAM controller, for an experimental FPGA-based reconfigurable processor for a small satellite.
- Evaluated various high-level language and graphical tools for the development of FPGA circuits, embedded systems, and replacements for legacy processors.
- Developed multiple VHDL implementations of a 32-bit RISC microprocessor for pedagogical use.
- Helped establish MS and PhD degree programs in Electrical and Computer Engineering
- Obtained over $1,000,000 of research funding and donations with $1,800,000 additional funding awarded and awaiting contract completion.

System Engineer / Scientist 6, June 2005 – Present
DCS Corporation, reporting through the DCS office in Ridgecrest, CA.

I work for DCS mainly during the summer months. During the school year I am a full-time employee of Baylor University.

Perform research to assist the F/A-18 ad EA-18 program offices located at the China Lake and Point Mugu Naval bases.
- Current projects include:
  - Algorithm development to improve the performance of an Electronic Attack (EA) mission planning system. This work includes:
    - Modeling of radar and jamming system performance
    - Research and development of path planning algorithms

- ▪ Research and development of high-level mission planning algorithms
- ▪ Development of a mission planning system using the MATLAB programming language
- ▪ Research of techniques to use of FPGAs, GPUs and HPC clusters to accelerate computational performance of mission planning systems
  - o Algorithm development to improve the geolocation performance of the ALQ-218.
- Completed projects include:
  - o Identified multiple high-level optimizations for the Navy's electronic attack mission planning system.
  - o Researched and documented "choke points" in the F/A-18 C/D avionics architecture.
  - o Developed a repartitioning of the MIL-STD-1553 message architecture that relieved a major problem limiting additional growth of the F/A-18 C/D avionics system and allowed for increased processing time during each time slice. This was incorporated into the F/A-18 C/D Mission Computer Flight Program by engineers at the F/A-18 Advanced Weapons Lab in China Lake, CA. This eliminated a major obstacle to continued growth of the avionics system.
  - o Developed and documented procedures for verifying real-time performance of the Operational Flight Program (OFP) for the F/A-18 C/D Mission Computer.
  - o Developed a software tool to assist software developers to optimize the use of memory in the F/A-18 C/D Mission Computer.
  - o Developed and characterized multiple compression routines to improve communications over the MIL-STD-1553 data bus. These routines had low computational complexity making them suitable for implementation on the legacy AYK-14 mission computer.
  - o Researched and documented methods of extending the life of the legacy avionics system, including methods for replacing the AYK-14 processor while minimizing the impact to the associated software.
  - o Researched and characterized Computer-Aided Design (CAD) tools for use in the development of avionics hardware and software.

Associate Professor, August 1996 – Aug. 2003
Department of Aeronautics and Astronautics, Naval Postgraduate School, Monterey, CA

- Developed and taught courses in avionics systems, digital design, and software engineering.
- Performed research in avionics, avionics systems, and reconfigurable computing, including projects related to the E-2C, EA-6B, F/A-18, V-22, and the JSOW GPS-guided weapon including:
  - o Analysis of potential upgrades to the F/A-18 avionics system
  - o Hardware acceleration of signal processing algorithms
  - o Methods to upgrade legacy avionics systems
  - o Analysis of replacements for the EA-6B
  - o EMI Shielding effectiveness of composite aircraft structures
  - o Evaluation of potential avionics network architectures using Fiber Channel
  - o A pilot warning system for the Vortex Ring State (VRS)
  - o Using the JSOW against moving targets
- Produced 10 conference papers, 5 technical reports, 1 trade magazine article, 2 invited conference presentations, and 10 additional conference presentations without associated papers.
- Obtained over $750,000 of research funding.

Lead Engineer, August 1983 – August 1996
Lockheed Martin Aeronautics Company, Fort Worth, TX.

- Served as the Lead Engineer for the F-22 Stores Management System (SMS) Modular Hardware Design group.
  - o Designed, debugged, qualified and supported a variety of avionics line replaceable modules (LRMs) which performed mission-critical and safety critical functions.

- o Responsibilities included: technical leadership of a team of 12 engineers reporting on a full-time basis and many others reporting on a part-time basis, estimating and meeting schedule and budget for the design group, and algorithm development.
- Earlier assignments involved avionics development for F-16 and F-111 aircraft and classified programs, including several variants of the F-16's Data Entry Electronics Unit (DEEU)
- Designed LRUs, SRUs and LRMs including:
  - o Embedded controllers using multiple microprocessors and FPGAs
  - o Interfaces for multiple parallel and serial interface standards including MIL-STD-1553 and ARINC 429
  - o High current switching to drive weapons systems and weapon bay doors
  - o Audio and video digitization
  - o Digital signal processing
- Designed and programmed test equipment for avionics equipment.
- Involved with every part of the life-cycle of avionics systems, including bid and proposal, specification, preliminary design, detailed design, integration, testing and verification, qualification and reliability testing, full scale production, field support, and system upgrades.

Engineer, April 1979 – August 1983
RTEC Systems Corporation, Bedford, TX

- Designed and programmed test equipment for telecommunications systems.
- Performed reliability assessments and qualification of telecommunications equipment.
- Provided technical supervision of two technicians and one intern.

Engineer, June 1978 – April 1979
Texas Instruments, Inc., Lubbock, TX

- Component engineer for LED and LCD watches.
- Researched battery technology for low current, long lifetime applications.
- Technical leadership of one technician.

Design Skills

- Avionics system design
- Avionics architecture, networking, open systems and updating of legacy systems
- Algorithm development for a wide range of military avionics applications including electronic warfare, mission planning, and performance optimization
- Avionics interface standards including MIL-STD-1553, MIL-STD-1760, and ARINC 429
- Avionics design standards including DO-178, DO-254, MIL-STD-498
- Digital hardware design using VHDL, Verilog, and Impulse C
- Embedded system design with a variety of processors including the 8051, 80x86, Atmel AVR, PowerPC and Xilinx MicroBlaze families
- Application of FPGAs to reconfigurable computing and digital signal processing
- Design of custom microprocessors
- Computer architecture research and design
- Real-time systems and RTOS design
- High Performance Computing and HPC architectures
- Digital signal processing, digital filtering, adaptive filtering, image processing
- Neural networks, machine learning, artificial intelligence and software agents
- Analog design at audio through video frequencies
- System engineering
- Software engineering and programming

Computer-Aided Design Tools

- Various digital CAD tools including Xilinx ISE, Xilinx EDK, Xilinx System Generator, ModelSim, and Synplicity synthesis tools
- Programming with Ada, Basic, C, C++, Fortran, Pascal, and multiple assembly languages
- Multiple operating systems including Microsoft Windows, Palm OS, Linux and uCOS-II
- Multiple specification, development and debugging tools and environments
- MathCAD, MATLAB, Simulink
- High Performance Computing tools including Carte C, MPI, Pthreads, and Impulse C

Awards and Honors

- Twice nominated for Baylor **Outstanding Faculty Scholarship** Award, 2007 and 2008
- Invited to speak at the **National Academies** Decadal Survey of Civil Aeronautics
- Naval Postgraduate School **Outstanding Instructional Performance** Award, 2002
- 34th IEEE Midwest Symposium on Circuits and Systems, Myril B. Reed **Outstanding Paper** Award, 1991
- Southern Methodist University's Frederick E. Terman **Outstanding Electrical Engineering Graduate Student** Award 1990 - 1991
- **General Dynamics Doctoral Fellowship**, 1989 – 1991
- Eta Kappa Nu, Electrical Engineering Honor Fraternity, 1975 - 1977
- University Scholars Scholarship at the University of Oklahoma, 1973 – 1974

Funded Research

- "Avionics Life Extension" Sponsor: NAVAIRSYSCOM. This includes approximately $1,800,000 of funding extending through September 2013. The money is awaiting the final contract arrangements.
- Obtained a donation of FPGA-based ASIC simulators to support reconfigurable computing research. The equipment is valued at $437,136.
- Co-Principal Investigator, "F/A-18 Avionics Research," Sponsor: DCS Corporation via funding from the Naval Air Warfare Center-Weapons Division at China Lake, $296,469 over 3 years, June 2006-May 2009.
- "F/A-18 Avionics Architecture," Sponsor: The Naval Postgraduate School via funding from the Naval Air Warfare Center-Weapons Division at China Lake, $65,000. December 2003 – October 2004.
- "F/A-18 C/D Avionics Architecture Study," Sponsor: The Naval Air Warfare Center-Weapons Division at China Lake, $210,000, October 1999-December 2003.
- Note: The above 3 contracts represent **sustained funding** from the same source for a period spanning from October 1999 to May 2009.
- "Experiment Design for a Reprogrammable Satellite," Sponsor: Naval Postgraduate School, $34,403, 2004-2006.
- "Signal Processing with a Reconfigurable Computer," Sponsor: Naval Postgraduate School, $29,246, 2003-2005.
- "E-2C UESA (UHF Electrically Scanned Array) Studies," Sponsor: NAVAIR, $20,000, 2002.
- Co-Principal Investigator with LCDR Dean Wilson (thesis student), "Analysis of Tracking Characteristics and ID Contributions of Diverse Systems and Data Sources for Multiple Source Integration (MSI)," Sponsor: Naval Air Warfare Center-Aircraft Division, $40,000, 2000-2001.
- Co-Principal Investigator, "Vortex-Ring State Warning System Research and Validation," Sponsor: Office of Naval Research, $40,000, 1999-2000.
- Co-Principal Investigator, "Rapid Air-Ground Retargeting," Sponsor: PMA-201, Conventional Strike Weapons, $167,000, 1998-2000.

- Co-Principal Investigator with LCDR David Varnes (thesis student), "Pilot and Crew Aids for the H-60 Helicopter," Sponsor: Office of Naval Research, $25,000, 1999.
- Co-Principal Investigator, "An Unmanned Air Vehicle Ballistic Missile Launcher Detection and Destruction System," Sponsor: Institute for Joint Warfare Analysis, $100,000, 1998.
- "Virtual Prototyping of Avionics Systems," Sponsor: Naval Air Systems Command, Maritime Avionics Subsystems and Technology (MAST) Program, $45,000, 1997-1999.
- Co-Principal Investigator, "Avionics Laboratory Recapitalization Grant," Sponsor: Naval Postgraduate School, $25,000, 1998.
- Co-Principal Investigator, "Passive Sensor-Based Control of Nonlinear Autonomous Systems," Sponsor: Office of Naval Research, $62,113, 1997.

Journal Papers

1. **Duren, Russell W**., "Performance enhancement of avionics systems," Aerospace and Electronic Systems Magazine, IEEE, vol.25, no.7, July 2010, pp. 25-29.
2. **Duren, R. W.**, Marks, R. J., II, Reynolds, P. D. and Trumbo, M. L., "Real-Time Neural Network Inversion on the SRC-6e Reconfigurable Computer," Neural Networks, IEEE Transactions on, vol. 18, May 2007, pp. 889-901.
3. **Duren, R.** "Options for Upgrading Legacy Avionics Systems," AIAA Journal of Aerospace Computing, Information, and Communication, June 2006 vol. 3 no. 6, pp. 251-259.
4. Fouts, D. J., Macklin, K. R., **Duren, R. W**, and Zulaica, D. P., "Electronic Warfare Digital Signal Processing On COTS Computer Systems With Reconfigurable Architectures," AIAA Journal of Aerospace Computing, Information, and Communication, Oct. 2005 vol. 2 no. 10, pp. 414-429.

Best in Conference Paper

5. **Duren, R.** and Peikari, B., "A New Neural Network Architecture for Rotationally Invariant Object Recognition," Proceedings of the 34th Midwest Symposium on Circuits and Systems, Volume I, pp. 320-323, Monterey, CA, 14-17 May 1991. **Selected as Best Paper in Conference**.

Invited Presentation to the National Academies

6. **Duren, R.**, "Avionics Research Challenges," presented at the National Academies Decadal Survey of Civil Aeronautics, Washington, DC, 15 November 2005.

Conference Papers

7. **Duren, R.**, "Algorithmic and Architectural Methods for Performance Enhancement of Avionics Systems," Proceedings of the 28th Digital Avionics Systems Conference, Orlando, FL, 25-29 October 2009.
8. **Duren, R.** and Thompson, M, "Application of Data Compression to the MIL-STD-1553 Data Bus," Proceedings of the 2008 IEEE Aerospace Conference, Big Sky, MT, 1-8 March 2008.
9. **Duren, R.**, Stevenson, J. and Thompson, M., "A Comparison of FPGA and DSP Development Environments and Performance for Acoustic Array Processing," Proceedings of the 50th IEEE International Midwest Symposium on Circuits and Systems, Volume I, pp. 320-323, Montreal, Canada, 5-8 August 2007.
10. Reynolds, P.D., **Duren, R.W.**, Trumbo, M.L., and Marks, R.J., II, "FPGA implementation of particle swarm optimization for inversion of large neural networks," Proceedings of the 2005 IEEE Swarm Intelligence Symposium, Pasadena, CA, 8-10 June 2005, pp. 389-392.
11. Surratt, M., Loomis, H. H., Ross, A. A., and **Duren, R.**, "Challenges of Remote FPGA Configuration for Space Applications," Proceedings of the 2005 IEEE Aerospace Conference, Big Sky, MT, 5-12 March 2005.

12. **Duren, R.**, Fouts, D., and Zulaica, D., "Performance Comparison of CORDIC Implementations on the SRC-6E Reconfigurable Computer" presented at the 2003 MAPLD International Conference, Washington, D.C., 9-11 September 2003.
13. **Duren, R.** "Options for Upgrading Legacy Avionics Systems," Proceedings of the 21st Digital Avionics Systems Conference, pp. 12.C.2.-1-12, Irvine, CA, 27-31 October 2002.
14. Hutchins, R. G, Wilson, D., Allred, L. K., and **Duren, R.**, "Alternative Architectures for IMM Tracking of Maneuvering Aircraft," Proceedings of SPIE, Volume 4728, August 2002.
15. Schmidt, L. V. and **Duren, R.**, "Wing Induced Drag," Proceedings of the AIAA Atmospheric Flight Mechanics Conference, Monterey, CA, 5-8 August 2002.
16. **Duren, R.**, Couch, M. and Wood, E. R., "An Analysis Of 'Vortex Ring State' Encounters From Flight Test Data With Application To An Onboard Warning System," Proceedings of the 57th American Helicopter Society (AHS) Annual Forum, Washington, DC, 9-11 May, 2001.
17. Hendricks, S. and **Duren, R.**, "Using OPNET to Evaluate Fibre Channel as an Avionics Interconnection System," Proceedings of the 19th Digital Avionics Systems Conference, pp. 4.C.1-1-8, Philadelphia, PA, 7-13 October 2000.
18. Varnes, D., **Duren, R.** and Wood, E. R., "An Onboard Warning System to Prevent Hazardous 'Vortex Ring State' Encounters," Proceedings of the 26th European Rotorcraft Forum, pp. 88-1-22, The Hague, The Netherlands, 26-29 September 2000.
19. **Duren, R.**, "Development of a Small Rotary-Wing Autonomous Vehicle," Proceedings of the 18th Digital Avionics Systems Conference, pp. 6.A.2-1-8, St. Louis, MO., 24-29 October 1999.
20. Barnaby, J. and **Duren, R.**, "Development of a Standard Interface for a New Generation of Miniature Stores," Proceedings of the 18th Digital Avionics Systems Conference, pp. 1.C.1-1-7, St. Louis, MO., 24-29 October 1999.
21. Varnes, D. and **Duren, R.**, "Pilot and Crew Aids for the H-60 Helicopter," Proceedings of the 18th Digital Avionics Systems Conference, pp. 4.D.4-1-8, St. Louis, MO., 24-29 October 1999.
22. **Duren, R.** and Peikari, B. "A Comparison of Second-Order Neural Networks to Transform Based Methods for Translation and Orientation Invariant Object Recognition," in Neural Networks for Signal Processing - Proceedings of the 1991 IEEE Workshop, pp. 236-245, Princeton, NJ, 30 September – 2 October, 1991.

Technical Reports

- **Duren, R.**, "MATLAB EA Mission Planning Program – Revision 0.0.0.8," November 2, 2010
- **Duren, R.**, "MATLAB EA Mission Planning Program – Revision 0.0.0.7," August 4, 2010
- **Duren, R.**, "MATLAB Program for EA Mission Planning Research," June 21, 2010
- **Duren, R.**, "Mission Planning Research Summary," October 5, 2009
- Brewer, B. E., Kurdian, A. H. and **Duren, R.**, "Tactical Considerations in Choosing an Electrically Scanned Array for Incorporation in the E-2C Hawkeye," 18 April 2002.
- **Duren, R.**, "F/A-18 C/D Avionics Architecture Upgrade Study Status Report," 26 January 2001.
- **Duren, R.**, "F/A-18 C/D Avionics Architecture Upgrade Study: An Introduction to CPU Tech," 12 January 2001.
- **Duren, R. W.**, "Report on Previous Studies Related to the EA-6B Follow-on Platform," paper provided to the Airborne Electronic Attack (AEA) Analysis of Alternatives (AoA) Technical IPT, June 5, 2000.
- **Duren, R.** and Tyo, S., "Report on F-18 E/F EMI Susceptibility Due to Effectiveness of Composites for EM Shielding," 13 October 1999

Online Trade Journal Article

- **Duren, R.**, "Low Cost Reconfigurable Computing Cluster Brings Millions of Reconfigurable FPGA Gates to Students," FPGA and Structured ASIC Journal, 9 December 2008, Available online at http://www.fpgajournal.com/articles_2008/20081209_mentor.htm

Trade Magazine Article

- Varnes, D., **Duren, R.** and Wood, E. R., "Detecting the Vortex Ring State," Rotor & Wing, Vol. 34, No. 1, pp. 60-65, January 2000.

Invited Presentations

- **Duren, R.**, Wood, E. R. and Couch, M., "NPS Vortex Ring State Definition and Safety Data Review," Rotorcraft Aeromechanics Workshop, Patuxent River, MD, 18-19 July 2000.
- Wood, E. R., Couch, M. and **Duren, R.**, "NPS Research on Vortex Ring State," Rotorcraft Aeromechanics Workshop, Patuxent River, MD, 18-19 July 2000.

Selected Presentations

- **Duren, R.**, Reynolds, P. and Ottewell, B., "Implementation of Large Neural Networks on the SRC-6e Reconfigurable Computer," Classified Advanced Technology Update Conference, Naval Postgraduate School, Monterey, California, July 15, 2004.
- **Duren, R.**, Fouts, D., and Zulaica, D., "Algorithm and Programming Considerations for Embedded Reconfigurable Computers," Seventh Annual Workshop on High Performance Embedded Computing (HPEC 2003), MIT Lincoln Laboratory, Lexington, MA, 22-25 September 22-25, 2003.
- **Duren, R.**, Couch, M. and Wood, E. R., "An Analysis of "Vortex Ring State" Encounters from Flight Test Data with Application to an Onboard Warning System," presented by request to a DoD committee investigating "Tiltrotor Aeromechanics Phenomena," NASA Ames Research Center, June 18, 2001.
- **Duren, R.**, "F/A-18 C/D Avionics Architecture Upgrade Study," F/A-18 Advanced Weapons Laboratory Combined Country Conference (AWL C3): Building Synergies – A Look to the Future, NAWCWD, China Lake, CA, 6 - 7 March 2001.
- **Duren, R.**, "F/A-18 C/D Avionics Architecture Upgrade Study," F/A-18 Advanced Weapons Laboratory Mission Systems Review, 21 February 2001.
- Varnes, D., **Duren, R.** and Wood, E. R., "Development of a Helicopter Vortex-Ring State Warning System Through a Moving Map Display Computer," presented at Boeing Helicopters, Inc., La Mesa, AZ, 26 May 2000.
- Varnes, D. and **Duren, R.**, "Vortex Ring State Warning System," presented by the request of Col. Nolan Schmidt, USMC, the V-22 Program Manager, to PMA-275. The charts were e-mailed to PMA-275 and presented by phone on 19 May 2000.
- Varnes, D. and **Duren, R.**, "Development of a Helicopter Vortex-Ring State Warning System Through a Moving Map Display Computer," presented to Ms. Susan Bales, Director, Naval Fleet/Force Technology Innovation Office, Monterey, CA, 29 September 1999.
- Varnes, D. and **Duren, R.**, "Development of a Helicopter Vortex-Ring State Warning System Through a Moving Map Display Computer," presented to representatives from PMA 299, Patuxent River, MD, 12 September 1999.
- **Duren, R.** and Kaminer, I., "Sensor Based Control of UCAV Autonomous Landing," ONR Meeting on Basic Research on Intelligent Autonomous Air Vehicles, Stanford University, Stanford, CA, 23-24 September 1997.

Thesis Supervision

- S. L. Dark, "Increased Computation Using Parallel FPGA Architectures," Master of Science in Electrical Engineering, Baylor University, December 2010
- W. S. Troy, "Construction and validation of a reconfigurable computer cluster," Master of Science in Electrical Engineering, Baylor University, August 2009

- W. Yue, "Research on board to board communication for a reconfigurable computing system," Master of Science in Electrical Engineering, Baylor University, August 2009
- B. O. Lam, "Implementation of lossless compression algorithms for the MIL-STD-1553," Master of Science in Electrical Engineering, Baylor University, December 2008
- C. C. Li Shen, "Evaluating Impulse C and multiple parallelism partitions for a low-cost reconfigurable computing system," Master of Science in Electrical Engineering, Baylor University, December 2008
- J. D. Franz, "An evaluation of CoWare Inc.'s Processor Designer tool suite for the design of embedded processors," Master of Science in Electrical Engineering, Baylor University, August 2008
- B. Ottewell, "Evaluating the SRC-6E Reconfigurable Computer C Programming Environment," Master of Engineering, Baylor University, 2006.
- J. C. Stevenson, "A Comparison of Field Programmable Gate Arrays and Digital Signal Processors in Acoustic Array Processing," Master of Science in Electrical Engineering, Baylor University, May 2006
- B. O. Weston, "Data Compression Application to the MIL-STD-1553 Avionics Data Bus," Master of Science in Electrical Engineering, Baylor University, December 2005
- P. D. Reynolds, "Algorithm Implementation in FPGAs Demonstrated Through Neural Network Inversion on the SRC-6e," Master of Science in Electrical Engineering, Baylor University, May 2005
- B. J. Fetter, "Design Recovery and Implementation of the AYK-14 VHSIC Processor Module Adapter with Field Programmable Gate Array Technology," Master of Science in Aeronautical Engineering with Distinction, December 2002
- W. B. Mayberry, "Life-Cycle Cost Analysis of F/A-18C/D Mission Computer and Data Bus Upgrade Options," Master of Science in Management, December 2002
- M. R. Croskrey, "Design Recovery and Implementation of the AYK-14 VHSIC Processor Module with Field Programmable Gate Array Technology," Master of Science in Aeronautical Engineering, September 2002
- C. M. Kidd, "System Assessment of the F/A-18 C/D Avionics Architecture for Long Term Support and Future Growth," Master of Science in Aeronautical Engineering, September 2002
- O. Samlioglu, "A Neural Network Approach for Helicopter Airspeed Determination," Master of Science in Aeronautical Engineering, March 2002
- D. A. Wilson, "Analysis of Tracking and Identification Characteristics of Diverse Systems and Data Sources for Sensor Fusion," Master of Science in Aeronautical Engineering, June 2001
- R. L. Mahr, "Evaluation of the Use of GPS-Aided Weapons to Attack Moving Targets," Master of Science in Aeronautical Engineering with Distinction, March 2001
- G. L. Reyhan, "Targeting and Fire Control System Analysis of the New Turkish Attack Helicopter 'The AH-1Z KingCobra'," Master of Science in Aeronautical Engineering, March 2001
- R. A. Degennaro, "Incorporation of an Enhanced Ground Proximity Warning System (EGPWS) in the NASA Ames Research Center CAE Boeing 747-400 Flight Simulator," Master of Science in Aeronautical Engineering, September 2000
- S. P. Hendricks, "Exploration Of Fibre Channel as an Avionics Interconnect for the 21st Century Military Aircraft," Master of Science in Aeronautical Engineering, September 2000
- L. Nance, "EA-6B Follow-on Study: UAVS and UCAVS," Master of Science in Aeronautical Engineering, June 2000
- J. Barnaby, "Miniature Munitions/Stores Functional Interface Requirements," Master of Science in Aeronautical Engineering, September 1999
- R. Smitha, "High Power Microwave Source Integration with an Unmanned Combat Air Vehicle," Master of Science in Aeronautical Engineering, September 1999
- D. Varnes, "Development of a Helicopter Vortex Ring State Warning System through a Moving Map Display Computer," Master of Science in Aeronautical Engineering, September 1999
- D. Greer, "Avionics System Development for a Rotary Wing Unmanned Aerial Vehicle," Master of Science in Aeronautical Engineering, June 1998

- M. McEwen, "Dynamic System Identification and Modeling of a Rotary Wing UAV for Stability and Control Analysis," Master of Science in Aeronautical Engineering, June 1998
- G. L. Goldsmith, "A System Analysis of a New ASCM (Anti-Ship Cruise Missile) Simulator," Master of Science in Aeronautical Engineering, March 1997

Ph.D. Dissertation Committee Member

- R. L. King, "Nonlinear Dynamics in the Modeling of Helicopter Rotor Blade Lead/Lag Motion," Ph.D., June 1999
- E. N. Hallberg, "On Integrated Plant, Control, and Guidance Design," Ph.D., September 1997
- O. E. Fitch, "The Control of Bifurcations with Engineering Applications," Ph.D., September 1997

Faculty Activities

- Member of Baylor's University Research Committee, 2010-2011
- Member of Baylor's University Calendar Committee, 2010-2011
- Faculty Sponsor for the Baylor Sailing Club
- Chairman of the 2009-2010 ECE Department Faculty Search Committee
- Served on two department search committees 2006-2008
- Worked on an Avionics Strategic Initiative and a PhD Strategic Initiative
- Participated in preparation for ABET and SACS accreditation
- Session Organizer for the 2005 and 2006 IEEE Aerospace Conference
- Chairman of Committee on Engineering Honors Program, Baylor 2004
- Member of the Software Engineering Committee, Baylor, 2003 - 2004
- Member of the Retirement, Insurance and Special Functions Committee, NPS, 2001 - 2002
- Departmental Representative to the Faculty Council, NPS, 1997 - 2001
- Member of the Naval Postgraduate School Faculty Executive Board, 1997 - 1998
- Exhibits Chairman for the 1998 IEEE International Symposium on Circuits and Systems
- Committee Chairman on Information Security Procedures and Secure Computing Laboratory Policies, NPS 1998

Professional Affiliations

- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Engineering Education (ASEE)
- Associate of Old Crows (AOC)
- Institute of Electrical and Electronic Engineers (IEEE) - Senior Member