Curriculum Vitae

Ronald J. Hayne, Ph.D.
Colonel, U.S. Army (Retired)
Professor, Electrical and Computer Engineering
Program Director, Computer Engineering
The Citadel
171 Moultrie Street
Charleston, SC 29409
(843) 953-2281
ron.hayne@citadel.edu

Education:

Ph.D. Electrical Engineering, University of Virginia	1999
M.S. Electrical Engineering, University of Arizona	1987
B.S. Computer Science, United States Military Academy	1980

Military Education:

Interservice Space Intelligence Operations Senior Course	2000
Command and General Staff College	1994
Materiel Acquisition Management Course	1993

Academic Appointments:

Professor / Program Director, Computer Engineering — 2006 - present
Department of Electrical and Computer Engineering
The Citadel, Charleston, SC
Responsible for development, preparation, and presentation of electrical and computer engineering instruction. Coordinates computer engineering curriculum.

Adjunct Professor — 2001 - 2006
Department of Electrical and Computer Engineering
George Mason University, Fairfax, VA
Responsible for development, preparation, and presentation of computer engineering instruction, including laboratory program.

Associate Professor / Director, Computer Engineering Group — 1987 - 1991
Department of Electrical Engineering and Computer Science
United States Military Academy, West Point, NY
Responsible for development, preparation, and presentation of electrical engineering instruction in upper-division courses. Coordinated computer engineering curriculum.

Professional Experience:

Director, Operations Support Group — 2002 - 2006
Defense Acquisition University, Ft. Belvoir, VA
Responsible for information technology, audio-visual, human resources, student services, publishing, facilities, contracting, logistics, and library support for students, staff, and faculty at regional campuses in VA, MD, OH, AL, and CA.

Chief, Information Technology and Analysis Division 1999 - 2002
National Security Space Architect, Fairfax, VA
Responsible for information technology and analysis support for the organization across the Department of Defense and the Intelligence Community.

Air Defense Artillery Technology Manager 1994 - 1996
Weapons Technology, Army Research Laboratory, Aberdeen Proving Ground, MD
Responsible for matching operational requirements with technology development, serving as a two-way link between the user and developmental communities.

Executive Officer / Research and Development Staff Officer 1991 - 1993
U.S. Army Space and Strategic Defense Command, Arlington, VA
Executive assistant to 3-star Commanding General. Coordinated the Command's Science and Technology Master Plan.

Honors and Awards:

Faculty Excellence in Teaching Award	2024
Award for Outstanding Contributions to the College Transfer Program	2024
Lawton Ellis Electrical and Computer Engineering Teaching Award	2023
C.A. Medbery Award for Dedication to Teaching	2019
Lawton Ellis Electrical and Computer Engineering Teaching Award	2018
IEEE Senior Member	2012
Lawton Ellis Electrical and Computer Engineering Teaching Award	2011
Defense Superior Service Medal	2006
Defense Meritorious Service Medal	2002
Joint Service Commendation Medal	2001
National Reconnaissance Office Director's Team Award	2001
Meritorious Service Medal	1996
Army Research Laboratory Enhancement Award	1996
Meritorious Service Medal	1991
Distinguished Cadet (Top 5% of class), USMA	1980

Professional and Honor Societies:

Institute of Electrical and Electronics Engineers (IEEE), Senior Member
American Society for Engineering Education (ASEE)
Military Officers Association of America
Tau Beta Pi Engineering Honor Society
Eta Kappa Nu Electrical Engineering Honor Society
Phi Kappa Phi Honor Society

Courses Taught at The Citadel:

ELEC 105 Engineering Fundamentals II (course director)
Spring 2009 - 2010
ELEC 106 Fundamentals of Electrical Engineering (course developer)
Fall 2012, 2014, 2015, 2017
ELEC 206 Computer Applications for Electrical Engineers (course director)
Spring 2007

ELEC 302 Electrical Machinery Laboratory
Spring 2007, 2010, 2018
ELEC 308 Elements of Electrical Engineering (course director)
Summer 2009, 2013
ELEC 311 Digital Logic and Circuits (course developer)
Fall 2006 - 2015, 2017 - 2024
ELEC 313 Electronics Laboratory (course director)
Fall 2007, 2009 - 2013, 2018 - 2020
ELEC 330 Digital Systems Engineering (course developer)
Spring 2007 - 2024
ELEC 413 Advanced Topics in Electrical Engineering (course developer)
Summer 2011
ELEC 418 Advanced Digital Systems (course developer)
Spring 2008 - 2022, 2024
ELEC 428 (413) Computer Architecture (course developer)
Summer 2012, 2014 - 2020, Fall 2021 - 2023
ELEC 675 Computer Architecture (course developer)
Summer 2016 - 2020, Fall 2022
HONR 400 Honors Directed Research Project
Fall 2007, Spring 2010

Courses Taught at George Mason University:

ECE 331 Digital Systems Design (course developer)
Fall 2001 - 2004, Spring 2002 - 2006
ECE 332 Digital Electronics and Logic Design Lab (course director)
Fall 2001 - 2004, Spring 2002 - 2006
ECE 445 Computer Organization (course developer)
Fall 2005

Courses Taught at the United States Military Academy:

EE 302 Introduction to Electrical Engineering I
Fall 1987
EE 362 Introduction to Electrical Engineering II
Spring 1988
EE 365 Digital Computer Logic (course developer)
Fall 1988 - 1991, Spring 1989 - 1991
EE 475 Computer Architecture (course developer)
Spring 1990 - 1991

Publications:

Book Chapters:

Hayne, R.J., "Design of an Instructional Processor," Supplement to: Roth, C.H. and John, L.K., *Digital Systems Design Using VHDL*, Third Edition, Cengage Learning, Boston, MA, 2018. [Online]. Available: http://academic.cengage.com/resource_uploads/downloads/1305635140_559956.pdf.

Hayne, R.J., “Design of an Instructional Processor,” Supplement to: Roth, C.H., John, L.K., and Lee, B.K., *Digital Systems Design Using Verilog*, First Edition, Cengage Learning, Boston, MA, 2016. [Online]. Available: http://academic.cengage.com/resource_uploads/downloads/1285051076_581158.pdf.

Peer-Reviewed Journals:

Hayne, R., Implementing Serial Communication for the Instructional Processor. *Journal of Higher Education Theory and Practice, 23*(13), 2023.

Barsanti, R., Hayne, R., and Peeples, J., Hands on Remote Learning Using a DC Motor Controller. *Journal of Higher Education Theory and Practice, 21*(12), 2021.

Hayne, R.J., “Translating the Instructional Processor from VHDL to Verilog,” *Computers in Education Journal, ASEE*, Vol. 9, No. 4, December 2018.

Hayne, R.J. and Moore, J.I., Jr., "Evolution of the Instructional Processor," *Computers in Education Journal, ASEE*, Vol. 6 No. 4, October - December 2015.

Hayne, R.J., "An Instructional Processor Design using VHDL and an FPGA," *Computers in Education Journal, ASEE*, Vol. 3 No. 2, April - June 2012.

Hayne. R.J., "Beyond VHDL Simulation to On-Chip Testing," *Computers in Education Journal, ASEE*, Vol. XVIII No. 4, October - December 2008.

Hayne, R.J., "VHDL Projects to Reinforce Computer Architecture Classroom Instruction," *Computers in Education Journal, ASEE*, Vol. XVIII No. 2, April - June 2008.

Peer-Reviewed Conference Proceedings:

Hayne, R.J., “Teaching Computer Architecture Using VHDL Simulation and FPGA Prototyping,” *Proceedings ASEE Annual Conference and Exposition*, Portland, OR, June 2024.

Hayne, R.J., “Synthesis vs. Simulation: Developing a Hardware Interrupt System for the Instructional Processor,” *Proceedings ASEE Southeastern Section Conference*, Charleston, SC, March 2022.

Barsanti, R.J., Hayne, R.J., and Peeples, J.W., “Hands on Remote Learning using a DC Motor Controller,” *Proceedings ASEE Southeast Section Conference*, March 2021.

Hayne, R.J., “Implementing Serial Communication for the Instructional Processor,” *Proceedings ASEE Virtual Conference*, June 2020.

Barsanti, R.J., Hayne, R.J., and Mazzaro, G.J., “Hands on Learning: A Four Year Laboratory Sequence for Electrical Engineering Students,” *Proceedings ASEE Southeast Section Conference*, Raleigh, NC, March 2019.

Hayne, R.J., “Translating the Instructional Processor from VHDL to Verilog,” *Proceedings ASEE Annual Conference and Exposition*, Salt Lake City, UT, June 2018.

Barsanti, R.J., Hayne, R.J., Bower, K.C., and Peeples, J.W., “An Undergraduate Engineering Ethics and Leadership Education Program,” *Proceedings ASEE Annual Conference and Exposition*, Columbus, OH, June 2017.

Mazzaro, G.J. and Hayne, R.J., "Instructional Demos, In-Class Projects, and Hands-On Homework: Active Learning for Electrical Engineering using the Analog Discovery," *Proceedings ASEE Annual Conference and Exposition*, New Orleans, LA, June 2016.

Hayne, R.J. and Moore, J.I., Jr., "Evolution of the Instructional Processor," *Proceedings ASEE Annual Conference and Exposition*, Seattle, WA, June 2015.

Hayne, R.J., "An Instructional Processor Design using VHDL and an FPGA," *Proceedings ASEE Annual Conference and Exposition*, Vancouver, B.C., Canada, June 2011.

Hayne, R.J., "Presynthesis Test Generation using VHDL Behavioral Fault Models," *Proceedings IEEE SoutheastCon*, Nashville, TN, March 2011.

Hayne, R.J. and McKinney, M.H., "Interdisciplinary Laboratory Projects Integrating LabVIEW with VHDL Models Implemented in FPGA Hardware," *Proceedings ASEE Annual Conference and Exposition*, Louisville, KY, June 2010.

Hayne, R.J., "Beyond VHDL Simulation to On-Chip Testing," *Proceedings ASEE Annual Conference and Exposition*, Pittsburgh, PA, June 2008.

Hayne, R.J., "VHDL Projects to Reinforce Computer Architecture Classroom Instruction," *Proceedings ASEE Annual Conference and Exposition*, Honolulu, HI, June 2007.

Hayne, R.J. and Johnson, B.W., "Behavioral Fault Modeling in a VHDL Synthesis Environment," *Proceedings VLSI Test Symposium*, Dana Point, CA, April 1999.

Kaufman, L.M., Gretlein, R., and Hayne, R.J., "A Quantitative Assessment of the Application of Software Reliability to Reusable Code," *Proceedings Reliability and Maintainability Symposium*, Washington, D.C., January 1999.

Hayne, R.J., Brown, P.A., Hair, S.G., and Oristian, J.E., "An Innovative Educational Application of the VHSIC Hardware Description Language," *Proceedings Frontiers in Education Conference*, Vienna, Austria, 1990.

Other Publications:

Hayne, R.J., "Behavioral Fault Modeling in a VHDL Synthesis Environment," doctoral dissertation, University of Virginia, School of Engineering and Applied Science, Charlottesville, VA, May 1999.

Presentations at Conferences and Professional Meetings:

Peer-Reviewed National/International Organizations:

Hayne, R.J., “Teaching Computer Architecture Using VHDL Simulation and FPGA Prototyping,” ASEE Annual Conference and Exposition, Portland, OR, June 2024.

Hayne, R.J., “Implementing Serial Communication for the Instructional Processor,” ASEE Virtual Conference, June 2020.

Hayne, R.J., "Translating the Instructional Processor from VHDL to Verilog," ASEE Annual Conference and Exposition, Salt Lake City, UT, June 2018.

Hayne, R.J. and Moore, J.I., Jr., "Evolution of the Instructional Processor," ASEE Annual Conference and Exposition, Seattle, WA, June 2015.

Hayne, R.J., "An Instructional Processor Design using VHDL and an FPGA," ASEE Annual Conference and Exposition, Vancouver, B.C., Canada, June 2011.

Hayne, R.J. and McKinney, M.H., "Interdisciplinary Laboratory Projects Integrating LabVIEW with VHDL Models Implemented in FPGA Hardware," ASEE Annual Conference and Exposition, Louisville, KY, June 2010.

Hayne, R.J., "Beyond VHDL Simulation to On-Chip Testing," ASEE Annual Conference and Exposition, Pittsburgh, PA, June 2008.

Hayne, R.J., "VHDL Projects to Reinforce Computer Architecture Classroom Instruction," ASEE Annual Conference and Exposition, Honolulu, HI, June 2007.

Hayne, R.J. and Johnson, B.W., "Behavioral Fault Modeling in a VHDL Synthesis Environment," VLSI Test Symposium, Dana Point, CA, April 1999.

Hayne, R.J., Brown, P.A., Hair, S.G., and Oristian, J.E., "An Innovative Educational Application of the VHSIC Hardware Description Language," Frontiers in Education Conference, Vienna, Austria, 1990.

Peer-Reviewed Regional Organizations:

Hayne, R.J., "Synthesis vs. Simulation: Developing a Hardware Interrupt System for the Instructional Processor," ASEE Southeastern Section Conference, Charleston, SC, March 2022.

Hayne, R.J., "Presynthesis Test Generation using VHDL Behavioral Fault Models," IEEE SoutheastCon, Nashville, TN, March 2011.

By Invitation Local Organizations:

Hayne, R.J., "Design of an Instructional Processor," Sigma Xi Brown Bag Lunch, The Citadel, February 2018.

Hayne, R.J., "Programmable Logic Devices," IEEE Coastal SC Section Meeting, Charleston, SC, October 2010.

Grants:

Citadel Foundation New Faculty Research Grant:

"Testbed for Advanced Digital Systems Development Using Hardware Description Languages and Programmable Logic Devices," November 2006, $2,720.

Citadel Foundation Presentation of Research Grant:

IEEE SoutheastCon, March 2011, $1470.

Citadel Foundation Faculty Development Grants:

ASEE Annual Conference and Exposition, June 2024, $3492.
Microcontroller Hardware and Software, July 2022-June 2023, $1500.
ASEE Southeastern Section Conference, March 2022, $250.
Learning IoT with Python® and Raspberry Pi®, July 2020-June 2021, $550.
ASEE Virtual Conference, June 2020, $500.
ASEE Annual Conference and Exposition, March 2018, $2413.
ASEE Annual Conference and Exposition, March 2015, $2522.
ASEE Annual Conference and Exposition, April 2013, $2209.
ASEE Annual Conference and Exposition, March 2011, $2500.
ASEE Annual Conference and Exposition, April 2010, $1861.
ASEE Annual Conference and Exposition, March 2008, $1893.
ASEE Annual Conference and Exposition, April 2007, $2000.

Senior Design Projects (Student Research):

Farley, K.N., Rogers, J., Short, J., and Larson, G., "Design and Implementation of an Interactive Dual-Train Display," *Proceedings 2024 Citadel Electrical Engineering Design Symposium*.

Pohlabein, N., Lott, T., and Reid, R., "Integrated Home Safety Network," *Proceedings 2023 Citadel Electrical Engineering Design Symposium*.

Campbell, M., McDonald, J., Bilitski, R., and Dowell, J., “JumpStart Alarm Clock,” *Proceedings 2022 Citadel Electrical Engineering Design Symposium.*

Kilpatrick, A., Furmanick, C., Watson, G., and Wiand, T., “The MailGuard,” *Proceedings 2021 Citadel Electrical Engineering Design Symposium.*

Cromwell, B., Marchant, R., Tipton, H., and Vanover, B., “Happy Hour Cocktail Mixer,” *Proceedings 2020 Citadel Electrical Engineering Design Symposium.*

Murray, L., Spohnholz, S., Stanton, M., and Wentley, M., "Smart Door Home Automation," *Proceedings 2019 Citadel Electrical Engineering Design Symposium*.

Terwilliger, A., Washington, Q., Foor, A., and Anderson, C., "Complete Pet Care System," *Proceedings 2019 Citadel Electrical Engineering Design Symposium*.

Dale, J., Tye, K., Ledford, N., and Matthew, R., “C.A.R.T.S: Crash Avoidance Railway Tracking System,” *Proceedings 2018 Citadel Electrical Engineering Design Symposium.*

Alexander, A., Kisabeth, M., Middleton, S., and Ramos, G., "Remote Access Door System,” *Proceedings 2018 Citadel Electrical Engineering Design Symposium.*

Nichols, W., Browne, D., Edwards, N., and Bryant, P., "TruBru Automated Brewing System," *Proceedings 2016 Citadel Electrical Engineering Design Symposium*.

Dedding, O., Miller, C., Snipes, W., and Chen, Y., "PanaCea: Medication Organization and Healthcare Integration," *Proceedings 2016 Citadel Electrical Engineering Design Symposium*.

Creed, W., Decker, J., Kerr, J., and Vandermolen, D., "The Smart Pour System," *Proceedings 2015 Citadel Electrical Engineering Design Symposium*.

Becherer, N., Eastwood, C., Shelton, S., Smith, C., and Smith, J., "RFI-Key," *Proceedings 2015 Citadel Electrical Engineering Design Symposium*.

Davis, D., Gause, A., Cardin, C., and Shannon, J., "The All-In-One," *Proceedings 2014 Citadel Electrical Engineering Design Symposium*.

Harrison, D., Hubbs, D., Gulipardo-Thompson, I., and Faucher, R., "Vehicle Parking Notification System," *Proceedings 2014 Citadel Electrical Engineering Design Symposium*.

Cummings, T., Feagin, J., Jenkins, B., Langan, J., and Stevick, B., "2013 IEEE Southeast Conference Hardware Competition: Autonomous Shipping-Container Sorting Robot," *Proceedings 2013 Citadel Electrical Engineering Design Symposium*.

Amalla, S., Isham, J., Lowe, S., and Sturgis Jr., D., "Pill Bottle Platform," *Proceedings 2013 Citadel Electrical Engineering Design Symposium*.

Finn, M., Ivashchenko, D., Rogers, D., and Barnhill, M., "Automated Saltwater Aquarium," *Proceedings 2012 Citadel Electrical Engineering Design Symposium*.

Diemer, D., Hargadine, C., Helfer, R., Mutters, J., and Valerio, V., "Automated Railway Control System," *Proceedings 2011 Citadel Electrical Engineering Design Symposium*.

Crenshaw, J., Kubik, J., Fernandez, W., and Malone, J., "The Advent of Comfort through a Brilliant Idea," *Proceedings 2010 Citadel Electrical Engineering Design Symposium*.

Kottraba, R., Jackson, R., Seabolt, T., and Huckaby, D., "IEEE Southeast Conference 2009 Hardware Competition - Team: EBOT," *Proceedings 2009 Citadel Electrical Engineering Design Symposium*.

Spell, B., Morgan, H., Riddick, L., and Throckmorton, J., "Online Reprogrammable LED Sign," *Proceedings 2008 Citadel Electrical Engineering Design Symposium*.

Student Research Projects:

Finlay, G., "Assembler for an Instructional Processor," Student Paper Competition, IEEE SoutheastCon, Orlando, FL, March 2012.

Smoak, E., "A Sustainable Future through Engineering," Honors Directed Research Project, April 2010.

Cobb, T., "Our Solar Solution," Honors Directed Research Project, April 2010.

Kelley, J., "Examine-a-Bit Program," Honors Directed Research Project, March 2008.

Professional Development Activities:

Conferences and Workshops:

ASEE Annual Conference, June 2024.
Artificial Intelligence (AI) Faculty Workshop, August 2022
ASEE Southeastern Section Conference, March 2022
ASEE Virtual Conference, June 2020
ASEE Annual Conference, June 2018
Getting Started with IoT for Research and Teaching Workshop, June 2018
Online Teaching Faculty Academy, Spring 2016
ASEE Annual Conference, June 2015
ASEE Annual Conference, June 2013
Machine Science, Bringing a First-year Programming Course to Life Using Programmable Microcontrollers Workshop, June 2013
IEEE SoutheastCon, March 2013
Excellence in Engineering Education (ExcEEd) Teaching Workshop, Spring 2012
IEEE SoutheastCon, March 2012
ASEE Annual Conference, June 2011
Texas Instruments MSP430 Microcontroller Workshop, June 2011
IEEE SoutheastCon, March 2011
ASEE Annual Conference, June 2010
IEEE SoutheastCon, March 2010
IEEE SoutheastCon, March 2009
ASEE Annual Conference, June 2008
Embedded System Design using the FPGA Workshop, June 2008
IEEE SoutheastCon, April 2008
ASEE Annual Conference, June 2007
ABET Faculty Workshop on Assessing Program Outcomes, June 2007

Advanced Courses:

Learning IoT with Python® and Raspberry Pi®, March 2021
Live Streaming (Canvas/Zoom/SWIVL) Training, July 2020
Best Practices in Teaching Online, April 2020
Canvas Fundamentals and Zoom Training, April 2020
Microchip MPLAB Code Configurator, Explorer 8 Development Board, October 2019
The Connected Microcontroller Lab, Imagination University Program, January 2017
MIPSfpga Fundamentals, Imagination University Program, November 2016

Xilinx Vivado Design Suite Tutorial, June 2016
Analog Discovery Portable Analog Circuit Design Kit Tutorial, May 2014
Xilinx Integrated Synthesis Environment VHDL Simulator Tutorial, June 2013
Microchip MPLAB X Integrated Development Environment Tutorial, February 2013
Microchip MPLAB Integrated Development Environment Tutorial, June 2009
Xilinx ChipScope Pro Tutorial, May 2007
Xilinx Integrated Synthesis Environment Tutorial, July 2006

Institutional Service:

Service to College:

- School of Engineering Building Committee (2022 - present)
- School of Engineering Innovation in Teaching Tack Force (2022 - 2023)
- School of Engineering Vision Task Force (2021 - 2022)
- Sabbaticals Committee (2018 - present)
- Faculty Senate (2017 - 2018)
- High Impact Practices Faculty Reading Group (2017)
- Fellow, Center for Cyber, Intelligence, and Security Studies (2016 - present)
- Interdisciplinary Study Committee (2017 - 2018)
- Graduate Curriculum Committee (2016 - 2017, 2023 - present))
- Tenure and Promotion Review Committees, School of Engineering and School of Science and Mathematics (2014 - present)
- Scholarship Committee (2014 - 2016)
- Core Curriculum Oversight Committee (2013 - 2016)
  - Chair (2015 - 2016)
- Evaluation of Instruction Committee (2010 - 2014)
- Computer Services Committee (2007 - 2013)
  - Chair (2009 - 2011)
- Pre-Knob Visits (2006 - present)

Service to Department of Electrical and Computer Engineering:

- Virtual Fourth-class Orientation (2021)
- Freshman Math Review (2015)
- Senior Design Microcontroller Applications Primer (2014 - present)
- Fundamentals of Engineering (FE) Exam Review (2013, 2016, 2018)
- Engineers Week Robotics Competition (2009 - present)
- Electrical and Computer Engineering Curriculum Committee (2007 - present)
- ABET Self-Study Committee (2007 - 2008, 2013 - 2014, 2022 - present)
- Faculty Search Committee (2012, 2019, 2021 - present)

Service to Students:

- Academic Advisor, Electrical Engineering Majors (2007 - present)
- Academic Advisor, Computer Engineering Majors (2019 - present)
- Academic Advisor, Charlie Company, SCCC (2007 - 2012)
- Faculty Advisor, IEEE Student Branch (2007 - 2015)
- Treasurer, IEEE Student Branch (2011 - 2018)
- Faculty Advisor, IEEE SoutheastCon Trip (2007 - 2013)
- Sponsor / Host Family to 30+ Cadets (2007 - 2021)
- Faculty Advisor, Senior Class Officers, SCCC (2007 - 2008)

Professional Service: (* indicates monetary compensation provided)

Service to the Community:

- Volunteer, Career & Technology Education Support Team, Charleston County School District (2022)
- Leadership Day, FIRST Lego League Service Project (2011 - 2021)
- FIRST Robotics, Palmetto Regional Competition (2011)
- *STEM (Science, Technology, Engineering, and Mathematics) Summer Camp, Baptist Hill High School (2010)
- Engineering Outreach Visits, local schools (2008 - present)
- Engineering Outreach Visits, Columbia schools ALERT Program (2007 - present)

Service to the Discipline:

- *Reviewer, Digital Logic Design course, McGraw Hill (2023)
- Volunteer, American Society for Engineering Education Southeast Section Conference (2022)
- *College Board AP Engineering Research Study (2015)
- Reviewer, *Computers in Education Journal*, ASEE (2015 - present)
- Reviewer, Computers in Education Division, ASEE Annual Conference (2014 - present)
- Electronics Engineering Technology Advisory Committee, Trident Technical College (2010 - present)
- *Reviewer, *Fundamentals of Digital and Computer Design with VHDL* (2010)
- Executive Committee, IEEE Coastal SC Section and Chapter (2007 - 2014)
- * Panel Member, National Defense Science and Engineering Graduate Fellowship Program (2007 - 2012)