Richard A. Raines

Biographical Information

Demographic

Director, Cyber and Data Analytics Initiative UT-
Battelle LLC
Oak Ridge National Laboratory
One Bethel Valley Road
PO Box 2008 MS 6242 Oak
Ridge TN 37831-6242 Phone:
(865) 241-7390
E-mail: rainesra@ornl.gov

Education

July 1994	**Ph.D., Electrical Engineering, Virginia Polytechnic Institute & State University, Blacksburg, Virginia** Dissertation Title: *Performance Modeling and Analysis of Parallel Processing and Low Earth Orbit Satellite Communication Systems.*
December 1987	**Master of Science in Computer Engineering, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio** Thesis Title: *Performance Modeling and Analysis of Interconnection Networks for Parallel Processing.*
December 1985	**Bachelor of Science in Electrical Engineering - Cum Laude, The Florida State University, Tallahassee, Florida**

Specialized Education

2014	Stanford Venture Investing Process of Technology Companies Program—40 hours
2013	Gas Centrifuge Operations—Oak Ridge National Lab—40 hours
2006	SANS Institute Security – 50 hours Pittsburgh, PA
2005	Ethical Hacking and Penetration Testing – 60 hours Infosec Institute, Los Angeles, CA
2003	Biometrics for Information Assurance – 40 hours West Virginia University, Arlington, VA
1998	Military Satellite Communications – 40 hours AFCEA, Fairfax, VA
1997	Information Warfare - 40 hours Maxwell AFB, AL
1996	Computer Network Security - 40 hours AFCEA, Fairfax, VA

1995	Academic Instructor School - 120 hours
	Maxwell AFB, AL
1990	Management of Software Acquisition Course - 40 hours Ft
	Belvoir, VA
1989	Fiber Optic Communications - 40 hours
	AFIT, Wright-Patterson AFB, OH
1989	Advanced Computer Resources Acquisition Course - 40 hours Eglin
	AFB, FL
1988	MIL-STD-1553 Seminar - 16 hours
	Destin, FL
1988	U. S. Army Logistics Support Analysis- 40 hours Eglin
	AFB, FL
1988	Computer Systems Security - 40 hours Eglin
	AFB, FL
1988	Computer Resources Acquisition Course - 80 hours
	Brooks AFB, TX
1988	Acquisition Management 100 - 40 hours Eglin
	AFB, FL

Professional Military Education

1999	Air Command and Staff College by correspondence—year-long leadership/management course for mid-level officers
1991	Squadron Officer School—six week leadership/management school for junior officers Maxwell AFB, AL
1989	Squadron Officer School by correspondence—year-long leadership/management course for junior officers
1977	Advanced Individual Training for Nike Track Radar and Computer Repair—44 week course covering electronics for radar/computer systems U. S. Army Missile and Munitions School Redstone Arsenal, AL

Professional History

2013 – Present	**Director, Cyber and Data Analytics Initiative**, UT-Battelle LLC, Oak Ridge National Laboratory (ORNL), Oak Ridge Tennessee. Responsible for cybersecurity and data analytics research and development at ORNL. Develops and promotes lab-wide cybersecurity R&D strategy. Leads internal Laboratory Director Research and Development (LDRD) efforts for cybersecurity of energy systems. Conducts technical interchange meetings with ORNL research staff and partners; provides strategic briefings to national and international forums; develops and matures business relationships between ORNL and government, industry, and academia; manages $30M research portfolio. Works with national and international defense nuclear nonproliferation partners for cybersecurity threat mitigation. Develops strategies and research proposals for data analytics.
2013 – Present	**Joint Faculty Appointment, Professor of Electrical Engineering**, University

of Tennessee, Knoxville. Periodically teaches and consults with/to the Department of Electrical Engineering and Computer Science on cybersecurity education and research.

2013 – Present   **Professor Emeritus**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Dayton Ohio.

2007 – 2013   **Professor of Electrical Engineering**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright- Patterson AFB, OH. Expertise in computer communication networks, wireless communication systems, and computer networking security. Teaches classes in computer software and network application exploitation. Provides research leadership for software protection, biometrics, anonymous communication systems, attack and protection tree modeling and analysis, and satellite communication systems vulnerabilities.

2006 - 2013   **DoD Cyber Transformation Chair**, Center for Cyberspace Research (CCR), Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH. Externally funded by the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)). Develops, directs, promotes, and implements transformational education and research agendas related to cyberspace and information security. Provides integrating leadership for cyber force transformation. Works with 15 DoD academic institutions and national senior leaders to promote transformational education and research for workforce development. Represents AFIT at national and international force transformation meetings.

2002 – 2013   **Director, Center for Cyberspace Research (CCR)**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH. Founding Director of CCR. Founding Director of the Air Force Cyberspace Technical Center of Excellence (designated by Secretary of the Air Force in June 2008). Formulates and directs day-to-day operation of Center which supports 22 graduate faculty members, 25 researchers/staff members and operates on an annual externally funded budget of close to $20M. Established nationally recognized Center of Academic Excellence in Information Assurance Education (2002); Center of Academic Excellence in Research (2009); and Center of Excellence in Cyber Operations (2013). Responsibilities include the discovery, resourcing and implementation of new and emerging cybersecurity researcher thrusts, personnel management and acquisition of funding to support the Center operation, personnel, and research thrusts. Seeks and gains funding to support Center faculty and activities. Works with 156 other nationally recognized Centers of Academic Excellence in Information Assurance Education to establish policies, procedures, and curriculum. Works with the National Science Foundation and the Office of Personnel Management to promote and implement the Scholarship for Service Program. Represents AFIT at national workshops and colloquiums. Advises and works closely with the Senior leaders of DoD and Air Force, National Security Agency, Department of Homeland Security, Air Force Space Command, and 24th Air Force on issues related to research, education and force development requirements.

2002 – 2007   **Associate Professor of Electrical Engineering (Civilian faculty appointment, Tenured October 2004)**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright- Patterson AFB, OH. Expertise in computer communication networks and wireless communication systems. Teaches graduate-level courses in computer

networks, satellite communications, wireless communications, and information assurance. Directs and advises Masters and Ph.D.-level research in communication network modeling and analysis. Co-director of Communications Simulation Laboratory and the Wireless Information Networks and Security Laboratory. Provides technical consultation for Air Force and Department of Defense organizations.

1986 - 2002 **Officer, United States Air Force** (USAF), promoted to the rank of Major. Job assignments include:

1999 – 2002 **Associate Professor of Electrical Engineering (Military Tenure June 1999)**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH. Expertise in computer communication networks and wireless communication systems. Teaches graduate-level courses in computer networks, satellite communications, and wireless communications. Directs and advises Masters and Ph.D.-level research in communication network modeling and analysis. Co-director of Communications Simulation Laboratory. AFIT Point of Contact for National Security Agency Center of Academic Excellence in Information Assurance accreditation. Provides technical consultation for Air Force and Department of Defense organizations.

1998 - 2001 **Chief, Computer Science and Engineering Division**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH. Responsible for the successful operation of the Computer Science and Engineering Division. Managed division of 11 military and civilian Ph.D.-level faculty members. Responsibilities include the management of eight major curriculum areas, management of $30 million research laboratories, the scheduling of and workload distribution for over 50 courses supporting division's two academic programs, leading curriculum development/reviews and preparing documentation for ABET accreditation, generating performance reports for full-time USAF students and military faculty members, and full-time teaching and research related to communication networks.

1994 - 1999 **Assistant Professor of Electrical Engineering**, Department of Electrical and Computer Engineering, Air Force Institute of Technology, Wright-Patterson AFB, OH. Expertise in computer communication networks and wireless communication systems. Teaches graduate-level courses in computer networks, satellite communications, and wireless communications. Directs and advises Masters and Ph.D.-level research in communication network modeling and analysis. Provides technical consultation for Air Force and Department of Defense organizations.

1988 - 1991 **Lead Systems Engineer**, Air Combat Maneuvering Instrumentation (ACMI) Directorate, Deputy for Range Systems, Aeronautical Systems Division, Eglin AFB, FL. Responsible for engineering management of $80M program. Duties included site surveys to determine microwave communication capabilities, developing system specifications and statements of work, leading technical teams in source selections of developmental contractors, chairing interim program design reviews, reviewing/accepting/denying contractor developed system design and documentation, leading factory and site testing.

1986 - 1987 **Graduate Student**, Air Force Institute of Technology, Wright-Patterson AFB, OH. Masters student in Computer Engineering. Specialization in uniprocessor and distributed computer architecture. Research emphasis in interconnection networks for parallel processing.

1984 - 1986	**Engineer**, FSU Physics Dept., High Energy Group, The Florida State University. Responsible for design and development of high speed integrated circuits. Duties included installation and management of local area network, circuit board design and fabrication, and personal computer installation and upgrade.
1977 - 1980	**Nike Hercules Radar and Computer Repairman**, Stuttgart, Germany. Responsible for the operational readiness of four tracking radars and associated computer systems. Duties included troubleshooting to the board and component level, repair and replacement of defective electronic devices.

Licenses, Registrations, and/or Certifications

2005	Certified Ethical Hacker, INFOSEC Institute, April 2005
1999	Senior Member of IEEE—awarded for professional maturity and significant professional achievement—8% of 320,000 members hold this grade

Awards and Honors

2013	Emeritus Professor of Electrical Engineering, Air Force Institute of Technology
2013	U.S. Air Force Civilian Meritorious Service Award
2011	Government Information Security Leadership Award (Workforce Improvement)
2009	Tau Beta Pi, Eminent Professor, AFIT Chapter
2008	Air Force Science and Engineering Educator of the Year--Sept 2008 2008 Air Education and Training Command nominee for Air Force Outstanding Science and Engineering Educator
2007	Inducted into the Association of the Old Crows National Hall of Fame— for significant contributions towards the advancement of Information Operations and cyber warfare—October 2007
2007	Colonel Charles A. Stone Award, Wright Memorial Chapter Air Force Association—for personal leadership in the advancement of the Air Force Institute of Technology mission--September 2007
2007	The Kittyhawk Chapter of the Association of Old Crows, Information Operations Award winner—for significant contributions in development of information technology programs or related doctrine or tactics, or in the application of information operations
2007	AFIT, AU, AETC Nominee for the Secretary of the Air Force Harold Brown Award--for significant achievement in research and development
2005	General Bernard E. Schriever Award, Wright Memorial Chapter Air Force Association—for advancing aerospace power, technology, Air Force doctrine, and military as a profession—April 2005
2005	Eta Kappa Nu Electrical Engineering Instructor of the Year 2004-2005 2003 AFIT nominee, 2002 General Muir S. Fairchild Educational Achievement Award—Air University award for achievement in curriculum/program development
2002	Lieutenant Colonel Charles P. Brothers Jr. Outstanding Volunteer Service Award—Graduate School of Engineering and Management award for sustained exemplary volunteer service to community and profession
2002	Air Force Meritorious Service Medal—awarded for meritorious service as Chief,

	Computer Science and Engineering Division and Associate Professor of Electrical Engineering
2001	AFIT Board of Visitors' Colonel Charles E. Stone leadership award nominee from Graduate School of Engineering and Management—chosen from 45 military faculty
2001	Air Force Commendation Medal -- awarded for outstanding achievement in the development and presentation of the AFIT Warrior Brief to senior leaders of the Air Force
2000	Top-rated Major in Graduate School of Engineering and Management (out of 26)—recognized for outstanding professional leadership and technical accomplishments
2000	Da Vinci Best Paper co-author *2000 IEEE National Aerospace and Electronics Conference*
2000	Military Outstanding Volunteer Service Medal—awarded for outstanding long-term volunteer service to local community
1999	Sequential Tour Faculty—only top 16% of military faculty granted second faculty tours
1999	Master's thesis advisor for Armed Forces Communications and Electronics Association Research Excellence Award winner
1998	Air Force Meritorious Service Medal—awarded for meritorious service as assistant professor of electrical engineering
1998	Graduate School of Engineering nominee for Air Education and Training Command Educator of the Year Award—selected from 47 graduate military faculty
1998	IEEE Distinguished Speaker Award – presented by the Communications Society of IEEE, Mohawk Valley Section, Rome NY, April 1998
1996	Air Force Institute of Technology Company Grade Officer of the Quarter January - March -- competitive award given in recognition of outstanding achievement in teaching, research, and community service
1991	Air Force Commendation Medal -- awarded for meritorious service and performance in engineering management and system acquisition from January 1988 to June 1991
1991	Graduated in top 10% of Squadron Officer School (class size of 641) 1991 Voted *Outstanding Contributor,* Squadron Officer School
1990	ASD/YI Company Grade Officer of the Quarter, October - December 1990 -- competitive award given in recognition of outstanding engineering management service to System Program Office
1990	ASD/YI Military Employee of the Quarter, July - September 1990 -- competitive award given in recognition of exceptional performance as lead engineer for Alaskan ACMI program
1989	MSD/CZ Company Grade Officer of the Quarter, July - September 1989 -- competitive award given in recognition of superior performance in source selection for Alaska and Wisconsin ACMI systems
1989	MSD/YI Company Grade Officer of the Quarter, July - September 1989 -- competitive award given in recognition of outstanding military and professional performance for officers in rank of captain and below
1989	Air Force Achievement Medal -- awarded for exceptional performance in source selection of contractor for Alaska and Wisconsin training ranges
1979	U. S. Army Good Conduct Medal
1977	Distinguished Graduate, Advanced Individual Training for Nike Track Radar and Computer Repair
1977	Redstone Arsenal Soldier of the Month, May 1977