

Augustus Way Fountain III

Curriculum Vitae

Office Address:

Department of Chemistry and Biochemistry
University of South Carolina
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EDUCATION:

- Ph.D.** The Florida State University, Tallahassee, Florida
Major: Analytical Chemistry, 1997
Dissertation Advisor: Charles K. Mann
Dissertation Title: Abscissa Calibration and Transfer for the Development of Instrument Independent Raman Spectra
- M.S.S.** The United States Army War College, Carlisle, Pennsylvania
National Strategic Studies, 2004
Strategic Research Project Advisor: Leonard Fullenkamp
Strategic Research Project: Transforming Defense Basic Research Strategy
- M.S.** The Florida State University, Tallahassee, Florida
Major: Analytical Chemistry, 1994
Thesis Advisor: Thomas J. Vickers
Thesis Title: The Fourier Transform Approach to Raman Spectroscopy
- B.S.** Stetson University, DeLand, Florida
Major: Chemistry, ACS Certified, 1985
Research Advisor: Edwin Coolidge
Research Title: Application of Differential Pulse Anodic Stripping Voltammetry for the Determination of Selected Heavy Metals

QUALIFICATIONS SUMMARY

Highly driven Executive-level professional and scientist with over 35 years of diverse experience spanning the U.S. Army and the Federal Government. Recognized as the Department of the Army's scientific ambassador to Government, Military, Industry, Academia, and International partners on a range of research and program areas. Poised to leverage vision, strategic perspective and awareness, and vast technical expertise to plan, direct, and oversee Department of Defense research programs in support of current and future military goals.

RESEARCH INTERESTS:

Analytical Chemistry: Vibrational Spectroscopy, Laser Spectroscopy, Chemometrics and Electrochemistry. My primary interests involve the development of novel methodologies, especially those using optical spectroscopy, for qualitative and quantitative analysis to solve difficult chemical problems. I am especially interested in the coupling of vibrational spectroscopy (both infrared and laser Raman spectroscopy) and optical imaging to gather chemical information remotely.

TEACHING EXPERIENCE:

1. While teaching with the Department of Chemistry and Life Science, United States Military Academy (1994 – 1997, 1998 – 2006) I taught, course directed, and/or supervised the following courses:
 - a. General Chemistry, CH101-102: a core course for all cadets. This course is a two-semester introduction to the plebe class in chemistry and the basic sciences. The cadet receives an overview of chemical theory, inorganic chemistry, organic chemistry, biochemistry, environmental chemistry, and military chemistry. Sixteen labs are conducted over the two semesters, with two being CAPSTONE labs, which the cadets design themselves.
 - b. Advanced General Chemistry, CH151-152: an alternate core course for cadets interested in majoring within the Math, Science, or Engineering disciplines. This course is a two-semester introduction to the plebe class in chemistry and the basic sciences. This course is an advanced coverage of the concepts and principles covered in CH101-102 including a more in-depth laboratory program with emphasis on instrumental analysis.
 - c. Introduction to Analytical Chemistry, CH371: a required course for all chemistry, chemical engineering and life science majors. The course teaches the fundamental concepts of analytical chemistry. Topics include acid-base equilibria, redox potentials, compleximetric titrimetry, separations, electrochemistry, and absorption spectroscopy. This course provides an overview of modern analytical techniques being used in various fields emphasizing the development of rigorous laboratory techniques and introduces the cadet to computer based data acquisition.
 - d. Inorganic Chemistry, CH472: an in-depth study of main group and transition elements and their compounds, with emphasis on chemical bonding and both atomic and molecular structures. The fundamentals of quantum chemistry to include the valence bond and molecular orbital theories as applied to inorganic chemistry are studied. An introduction to symmetry/group theory, coordination chemistry/crystal field theory, chemistry in aqueous and nonaqueous solutions, and organometallic compounds are also included in the course. Chemical principles and spectroscopic techniques will also be emphasized. Journal articles from the chemical literature are used to supplement the text with topics of current interest.
 - e. Instrumental Analysis, CH474: a required course for all chemistry majors and an elective course for life science majors. This course requires a multi-disciplinary outlook and focuses on the chemical theory and instrumental design of the major chemical analysis techniques. This course has 16 required laboratory exercises.
 - f. Physical Chemistry, CH483: a required course for all chemistry and life science majors. This course is an advanced look into the fundamental principles of chemistry; delving into the principles of thermodynamics, quantum mechanics, and statistical mechanics.
 - g. Introduction to Spectroscopy, CH487: an elective course for chemistry and life science majors. This course provides further development of the necessary theoretical background and an introduction to the spectroscopic methods applied to the study of molecular structure and species identification. Topics include electronic and vibrational energy levels of polyatomic molecules, optical selection rules, absorption and fluorescence, photo-dissociation.
 - h. Individual Research, CH489-490: an optional course for all chemistry and life science majors. This course is a two-semester effort toward the completion of a research project under the guidance of a faculty mentor. As the course director I was required to monitor the entire undergraduate research program, ensuring quality of effort from the cadet and proper supervision by the faculty members. As a faculty researcher, I have mentored 18 cadets and students over the past six years on chemical research projects that involve lasers and facilities maintained in the Photonics Research Center.
 - i. Light Infantry Operations and Tactics, MS202: a required course for third class cadets taught during the military inter-session. The focus of this course is the organization of the infantry platoon, its missions, and basic troop leading procedures.

2. From 1998 – 2001, I was involved in developing and co-teaching a six hour short course entitled *Visualizing a Digitized Battlefield*. The course was taught during two three-hour blocks on consecutive days. The short course was part of an advanced warfighter seminar for students enrolled in the Command and General Staff College (CGSC) at Fort Leavenworth, KS. TRADOC PAM 725-70: Battlefield Visualization Concept provided the framework for the course. We presented material on the science of modern warfighting as it influenced the commander's ability to visualize the battlefield. Rather than divide the course subjects by scientific discipline, we presented a simple model of the tools of battlefield visualization consisting of signals, sensors, computers and displays. We introduced and then reinforced the basic science of these four components by providing specific examples of applications to U.S. Army equipment.
3. As the USMA Fellow at the U.S. Army War College, I co-taught two electives with Professor Kevin Cogan. The two electives were 181cj Science and Technology for Strategic Leaders and 182cj Research and Development for Transformation. These electives were advanced graduate seminar classes focused on the challenges facing future strategic leaders in a wide variety of R&D areas which will shape future war fighting capabilities, weapons development, and military doctrine.
4. As an adjunct Professor of Chemistry and Biochemistry at the University of Maryland, Baltimore County (2008 – 2019) I taught CHEMISTRY 490B/684B, Special Topics in Chemistry (Chemometrics). This is a graduate-level introductory course in Chemometrics, which is the application of mathematical and statistical techniques for the analysis of data generated from instrumentation used in chemistry, biochemistry and related fields. This course presumes some knowledge of basic statistics, linear algebra and some prior exposure to simple computer programming. Brief reviews of concepts from probability, decision theory and experimental designs are provided as background and to guide discussion. The course's main focus is on the systematic evaluation of high-dimensional data through multivariate calibration and classification of multivariate chemical responses.
5. As an Instructor and Senior Instructor at the University of South Carolina, Columbia, SC from 2019 – 2023 I taught the following courses:
 - a. Principles of General Chemistry I and II (CHEM141/142). Advanced general chemistry for both Honors and Majors.
 - b. Introduction to Quantitative Analysis (CHEM321). Introduction of statistics, gravimetric, volumetric, and introductory instrumental analysis.
 - c. Introduction to Analytical Chemistry (CHEM322). Qualitative analysis, quantitative analysis, fundamental or method analysis, and molecular characterization.
 - d. Instrumental Analysis and Laboratory (CHEM621/CHEM621L). Chemical instrumentation including electronics, signal processing, statistical analysis, molecular/atomic spectroscopy, electrochemical methods, chromatography, and mass spectrometry. I was also responsible for maintaining the In Instrumental Suite in 1112 Greene for Advanced Electives
 - e. General Chemistry I and II (CHEM111/112). This is a survey of the principles that underlie all chemistry with applications illustrating these principles.
 - f. Spectrochemical Analysis (CHEM 722). A comprehensive study of the theory, instrumentation, methodology, and analytical applications of modern atomic and quantitative molecular spectrometry.
 - g. Introduction to Forensic Science (CHEM 107). Surveys scientific aspects of criminal investigation and adjudication including drug, arson, DNA, paint, and fiber identification.
 - h. Forensic Analytical Chemistry (CHEM 622). Analytical chemical methods in forensic science, including gathering of evidence, toxicology, drug identification, analysis of trace evidence, arson analysis, and DNA/serology.

RESEARCH EXPERIENCE:

- **December 2007 – July 2019, Edgewood Chemical Biological Center, Aberdeen Proving Grounds, MD.** Currently serves as the Department of the Army Senior Research Scientist (ST) for Chemistry within the Research and Technology Directorate, Edgewood Chemical Biological Center (ECBC). I am primarily responsible for planning, leading, and conducting cutting edge research in chemical defense related to the Research and Technology Directorate, ECBC, DA and DOD missions. I additionally provide executive leadership and supervisory guidance to the In-house Laboratory Independent Research (ILIR), R&T Seedling, and external basic research programs. In this capacity I ensure that all proposals selected are innovative, consistent with Army or DOD-CBDP future goals and of an appropriate risk to maintain state-of-the-art research knowledge and tools to stimulate innovation in technology development. I also ensure all project funding is appropriately obligated, that all research metrics are met, and reports submitted on time. Additionally I maintain continuing contact with other government agencies, the academic community and private industry to stay abreast of the latest scientific and engineering developments and foster technology transfer. I serve as an internationally recognized expert in chemistry for the DOD; continually reviewing domestic, foreign, open, and government literature in analytical chemistry, including intelligence reports, joint service research summaries and contractor reports. As well as serve as an at-large representative of the United States to the NATO Sensors & Electronics Technology Panel advising them on CBRNE detection. I also provide advice to top management for developing schedules and milestones for analytical chemistry and nanoscience projects to ensure appropriate emphasis on emerging technologies. From 2010 – 2012, I led a 60 person team across multiple organizations across the DoD to leverage existing and emerging chemical detection technologies to specifically detect the chemical signatures of military and homemade explosives. Also in 2010, I deployed to Iraq as a civilian scientist, advising the CEXC labs on the forensic analysis of explosives residues. I continue to lead several research efforts to develop and improve the forensic and bulk detection of explosive materials. This work includes a long standing collaboration with Carl Meinhart and Martin Moskovits to design and integrate microfluidic-surface enhanced Raman spectroscopy (SERS) based handheld sensors. From 2013 to present I have worked with Smith's Detection to extend the capability of handheld ion mobility based detectors to include explosives and drugs into military grade sensors. From 2011 to present I have worked with the US Army Criminal Investigation Laboratory to realize the concept of Raman Chemical Imaging for the analysis and identification of trace chemicals of interest to latent fingerprints. This effort has resulted in two generations of prototypes with the current being used by the Army in actual cases to determine its efficacy. During fiscal years 2016 and 2017 I successfully led a study into the gamma inactivation and sterility testing for *Bacillus anthracis*. The development of these studies had been assigned by OSD per DSD memo of 23 July 2015. The timely finalization and execution of this research was critical to support the harmonization of biosafety protocols across the DoD, CDC and interagency.
- **September 2006 – December 2007, Edgewood Chemical Biological Center, Aberdeen Proving Grounds, MD.** As a member of the Experimental Personnel Program for Scientific and Technical Personnel (EPPST) program, I served as the Senior Research Scientist in Electro-Optics (AD-1310-00) as it pertains to the chemical and biological standoff detection program at the Edgewood Chemical Biological Center (ECBC). I was responsible for planning, leading, and conducting all research associated with the use of electro-optics for the detection and identification of chemical and biological threats. With funding from the Joint IED Defeat Organization I lead a collaborative research project with MIT, Lincoln Laboratories to develop insights on explosive and chemical signatures; the spectroscopic and compositional differences in artillery shells; what role the non-energetic additives have on the signature; and through relevant background measurements, generate sensitivity and clutter-limited PD/PFa estimates for an idealized explosives sensor. Additionally I organized a one day workshop on explosives signatures to complete a focused gap analysis on the specific chemical signatures of military and homemade explosives in order to recommend spectroscopic studies of the operationally relevant background, explosive signatures in relevant spectral regions and potential spectral interferences. There were 25 workshop participants that represented various entities of the U.S. Army RDECOM, Naval Research Laboratory, NAVOED, Sandia National Laboratory, Lawrence Livermore National Laboratory, MIT-LL, JHU-APL, DHS, ATF, NGIC, INSCOM, NIST, ATF, and the FBI. I served as the Chair of the Trace Explosives Working Group for the Joint IED Defeat Organization and leading their effort in explosive signatures analysis. In this capacity I drafted a strategic

concept plan of chemical sensing of explosives for JIEDDO to include in the FY08-13 POM. I represented JIEDDO at the TSWG Explosives Detection sub-group and drafted for them a chemical sensing program for FY08. I also served as an external advisor on explosives to the Department of Justice and the National Science Foundation, which helps give me additional insight into other government needs.

- **July 1998 – August 2006, United States Military Academy, West Point, New York.** In collaboration with Dr. Nicholas Fell at the Army Research Lab, we investigated the use of various colloidal substrates for the detection of biological warfare contaminants in water using surface enhanced Raman spectroscopy (SERS). In a collaborative effort with the Department of Electrical Engineering and Computer Science and Picatinny Arsenal, I investigated the use of use of hyperspectral imaging to detect and defeat camouflage. Picatinny Arsenal provided us with the hyperspectral imager. We are in the process of determining the relative limits of precision for wavelength as part of our algorithm development. I continue to periodically investigate for the Defense Threat Reduction Agency the thermal degradation products of organophosphate ethers and the remote optical detection of chemical plumes. This research was initially used to correlate plume temperatures with peak and bandwidth shifts in the rotational structure in the ν_2 vibrational band of CO_2 . Previously, I conducted basic and applied research into the thermal and photochemical mechanisms involved with the laser-induced carbonization of polyimide films. I have developed these carbonized polyimide films as substrates for an all-polymer impedance sensor to detect chemical and biological agents. In 1998, I served as a peer reviewer for the U.S. Army Edgewood Research and Development Center (ERDEC), Aberdeen, Maryland and evaluated technologies using both long and open path Fourier-transform infrared spectroscopy and hyperspectral imaging to detect and monitor chemical warfare agents. This involvement developed into collaboration with Dr. William G. Fateley, Professor Emeritus, Department of Chemistry, Kansas State University and Dr. Robert T. Kroutil, ERDEC, Aberdeen, Maryland on the applications of mid-infrared hyperspectral imaging. In an effort funded by NASA, Dr. Marvin Salin, Professor, Department of Biochemistry, Mississippi State University, and I investigated the use of satellite or aircraft based NIR and MIR reflectance spectra of leafy plants to correlate the relative amounts of chlorophylls present.
- **July 1994 – July 1997, United States Military Academy, West Point, New York.** I conducted basic and applied research on the laser-induced carbonization of polyimide films and the development of electrochemical sensors from the carbonized surfaces. This work lead to a collaboration with Dr. Edward Lenoë in the Department of Civil and Mechanical Engineering, United States Military Academy on the use of scanning electron microscopy to characterize these surfaces. I developed the experimental procedures to monitor and characterize gases developed during the carbonization process, leading to a further understanding of the mechanisms involved. Additionally, I collaborated with Dr. Marvin Salin, Professor, Department of Biochemistry, Mississippi State University, and Visiting Professor, Department of Chemistry, United States Military Academy, on the mechanism of photobleaching in metallo-porphyrins; especially chlorophyllin and chlorophyll.
- **August 1994 - July 1997, The Florida State University, Tallahassee, Florida.** Research Assistant for Dr. Charles K. Mann, Professor, Department of Chemistry. As part of my dissertation, I conducted research on the abscissa and intensity calibration procedures required to transfer Raman spectra acquired using a high-resolution interferometer (linear in wavenumber) to an abscissa format that corresponds to a dispersive instrument (linear in wavelength). This research showed that the limits of precision for multichannel dispersive Raman are dependent on the unequal partitioning of radiant energy across adjoining detector elements. The procedures developed in this research will allow the development of instrument independent computer databases of Raman spectra.
- **August 1992 - July 1994, The Florida State University, Tallahassee, Florida.** Research Assistant for Dr. Thomas J. Vickers, Department of Chemistry. As part of my thesis research, I conducted research on the precision limits and calibration procedures for Raman spectra acquired on Fourier-transform based spectrometers. This work was part of a development of a fiber optic based Raman system to be used in the remote optical monitoring of nuclear wastes. In support of this work I compared the relative sensitivities for quantitative analysis of dispersive based Raman spectroscopy using visible excitation and interferometric based Raman using near infrared excitation. I also developed and built a spinning Raman cell for temperature sensitive and inhomogeneous samples.

GRANTS AND EXTERNAL FUNDING:

- **June 2022 – July 2023**, McCausland Innovation Fund, \$13,000, Forensic Science Course Development
- **October 2013 – September 2019**, United States Army, \$11.1M, Forensic Analysis of Explosive Signatures Applied Research
- **October 2013 – September 2019**, United States Army, \$10.5M, Forensic Analysis of Explosive Signatures Advanced Technology Development
- **October 2013 – September 2019**, United States Army, \$13M, Detection Mechanisms for Contaminants
- **October 2012 – September 2019**, United States Army, \$23M, Surface Science
- **October 2009 – September 2012**, United States Army, \$12.4M, Detection of Unknown Bulk Explosives (UBE) R.ECB.2010.01
- **July 2009 – 2012**, DHS, \$1.5M, VBIED Detection
- **July 2009 – March 2010**, DAPRA, \$250,000, Army Support to SERS S&T Fundamentals
- **December 2008 – December 2009**, JIEDDO, MIPR9B380J7098, \$1,872,000, Explosive Chemical Signature Analyses
- **November 2008 – September 2010**, Army Research Laboratory, Total Award \$1,400,00: ECBC portion \$200,000, Nanostructures for Sensors
- **July 2008 – September 2009**, DARPA, \$125,000, Army Support to SERS S&T Fundamentals
- **October 2007 – September 2008**, JIEDDO, MIPR7B380X7664, \$1,292,000, Signature & Analysis Studies
- **January 2007 – September 2007**, JIEDDO, MIPR7D139J7086, \$800,000, Signature & Analysis Studies
- **November 2006 – September 2007**, JIEDDO, MIPR7NCUIMEBDEBR056, \$25,000, Explosives Signatures
- **January 2004 – September 2005**, Picatinny Arsenal, MIPR4EP1C02037, Total Award \$226,000, Hyper-spectral Imagery
- **January 2004 – September 2005**, Defense Threat Reduction Agency, MIPR4CDPG78021, Total Award \$10,000, Gas Phase Infrared Hyper-spectra of Chemical Simulants
- **January 2002 – December 2004**, Army Research Office MIPR2FUSMAR023, Total Anticipated Award \$750,000: A. W. Fountain's portion \$142,100 Surface Enhanced and UV Resonance Enhanced Raman Spectroscopy for Biological Detection
- **October 2001 – September 2002**, Army Research Laboratory MIPR2DUMAN0133, \$26,000 Carbonized Polymer Based Micro-Biological Sensors
- **October 2001 – September 2002**, PM-Soldier Objective Force Warrior MIPR2B1BR17106, Total Award \$250,000: A. W. Fountain's portion \$25,000 Polymer Based Micro-Chemical Sensors
- **March 2000 – February 2003**, Defense Threat Reduction Agency MIPR00-2068/7381, \$50,000, Gas Phase Infrared Spectra of Chemical Simulants
- **April 1999 – March 2001**, Army Research Office MIPR9GNPSAR039, MIPROFUSMAR037, MIPR1GUSMAR036, Total Center Award \$688,000: A. W. Fountain's portion, \$134,777 Chemical Sensor Development: Applications Toward Raman and Infrared Hyper-Spectral Remote Chemical Imaging
- **April 1998 – March 1999**, Army Research Office MIPR8DUMAAR021, Total Center Award \$245,000: A. W. Fountain's portion, \$39,900 UV Laser Induced Carbonization of Polymers and Detection and Quantification of Chemical Warfare Gases
- **June 1998 – September 1998**, ERDEC, Project Safeguard, MIPR W90B32970390, \$15,000.
- **April 1997 – March 1998**, Army Research Office MIPR7DUMAAR023, Total Center Award \$160,500: A. W. Fountain's portion, \$7,200, Laser Induced Carbonization of Polymers
- **April 1996 – March 1997**, Army Research Office MIPRAR096-21, Total Center Award \$250,000: A. W. Fountain's portion, \$33,500, Laser Induced Carbonization of Polymers

RESEARCH STUDENTS and POST-DOCTORATE ASSOCIATES:

1. Dr. Neal Kline, Rapid Detection of Drugs and Explosives for Forensic Analysis, ORISE Post Doctorate Associate, July 2014 – July 2016.
2. Dr. Wenli Huang, Implementation of an error diffusion neural network (EDN) algorithm to identify chemical components in UV reflectance and Raman spectra, USMA Sabbatical Fellow, July 2013 – June 2014.
3. Dr. Erik Emmons, UV Surface Enhanced Resonance Raman Spectroscopy (UV-SERRS) NRC Post Doctorate Fellow, June 2008 – June 2011.
4. CDT Eric Ni, 2006, The Evaluation of a SERS Active Substrate for Biological Agent Spore Detection.
5. Mr. Frederick Nytko, Lehigh University, Summer 2005, Hyperspectral Imagery.
6. Dr. Edisanter Lo, Assistant Professor of Mathematical Sciences, Susquehanna University, May 2005 – August 2005, NRC Senior Post Doctorate Fellow.
7. Dr. James P. Jones, November 2002 – April 2004, ASEE Post Doctorate Fellow, Sensors and Electron Devices Directorate, Army Research Laboratory, Adelphi, Md.
8. CDT R. Brandon Ritz, 2003 Selection and Optimization of SERS Substrates for the Detection of E. Coli, Medical School. NYSAS Undergraduate Research Award in Applied Spectroscopy - 2003
9. Miss Christin M. Tombrello, Ithaca College, Summer 2002, 2003, & 2005, The Development of a SERS Active Substrate Capable of Biological Agent Detection Through Spectroscopy.
10. Miss Kristl V. Dorschner, Pamaona College, Summer 2002, The Development of a SERS Active Substrate Capable of Biological Agent Detection Through Spectroscopy.
11. Mr. Robert D. Jannarone, Bucknell University, Summer 2002, The Development and Evaluation of an All-Polymer G-Nerve Agent Sensor.
12. Mr. Vinay S. Shah, Rensselaer Polytechnic Institute, Summer 2003, Gas Phase Fourier Transform Infrared Analysis of Chemical Agent Plumes, Summer 2002, Development of a Molecular Imprinted Bio-Sensor from Carbonized Kapton™.
13. CDT Matthew Greb, 2002, The Development of a Polymeric Nerve Agent Sensor from Carbonized Kapton.
14. CDT Sherwin Cheuk, 2002, Surface Enhanced Raman Spectroscopy of Selected Biological Organisms.
15. CDT George Elias, 2002, Surface Enhanced Raman Spectroscopy of Selected Biological Organisms.
16. Miss Melissa Vellone, Rensselaer Polytechnic Institute, Summer 2001, Surface Enhanced Raman Spectroscopy of Selected Biological Organisms, NYSAS Undergraduate Research Award in Applied Spectroscopy – 2002.
17. Mr. Bryson Borgstedt, SUNY - Binghamton, Summer 2001, Gas Phase Spectra of Chemical Agent Simulants.
18. CDT Dylan Mack, 2001, Aqueous Detection of Biological Warfare Simulants using Surface Enhanced Raman Spectroscopy.
19. CDT Kevin Taylor, 2001, Aqueous Detection of Biological Warfare Simulants using Surface Enhanced Raman Spectroscopy, National Organization of the American Legion Award, Medical School.
20. CDT James Nicholson, 2001, The Development of Polymeric Sensors from Carbonized Kapton, Best Poster, Eastern Colleges Science Conference, April 2001.
21. CDT Teresa Van Heusen, 2000, NIR and MIR Reflectance Spectroscopy of Cotton Leaves.
22. CDT David Morehan, 2000, Fiber Optic Raman Spectroscopy of Adsorbed Chemical Species.
23. CDT Steve Dinetz, 2000, Infrared and Mass Spectral Analysis of UV Laser Pyrolysis Products, First Prize - Mid-Hudson American Chemical Society Undergraduate Research Symposium, SUNY New Paltz, 10 May 2000.
24. CDT Michael P. Szczepanski, 1999, The Remote Optical Detection of Gas Plume Temperature From Low Resolution Gas Phase Infrared Spectra Of Carbon Dioxide, College Recognition Award for Academics & Research, Mid-Hudson American Chemical Society, AY1999, Medical School.
25. CDT Elliot Bird, 1998 -1999, A Comparison of the Thermal and UV-Laser Pyrolysis of the Polyimide Kapton.
26. CDT Luis M. Alvarez, Mechanism of Oxidative Bleaching of Chlorophyllin, Hertz Scholarship - Luis Alvarez, MS (Biotechnology), MIT.
27. CDT Corey Shea, 1997, Mechanism of Oxidative Bleaching of Chlorophyllin.
28. CDT Jin Kim, 1997, Gas Phase Fourier Transform Infrared Analysis of UV Laser Induced Carbonization of Polyimides.

29. CDT Nelson So, Case Western Reserve (ROTC), Summer 1996, Development of a Silver Quasi-Reference Electrode for UV Laser Induced Carbon-Polyimide Microelectrodes.
30. CDT Gary Wynn, 1996, Development and Characterization of Glassy Carbon Electrodes Using UV Laser Induced Carbonization of Polyimides, Medical School.

SUPERVISORY EXPERIENCE:

- **Oct 2016 – September 2017**, *Office of the Deputy Assistant Secretary of the Army (Research & Technology), Arlington, Virginia*, Deputy Army Chief Scientist. I am primarily responsible for providing strategic vision and executive leadership for science and technology (S&T) horizon scanning, scientific studies, and international engagement for the Office of the Deputy Assistant Secretary of the Army (Research & Technology) (DASA(R&T)). I am the principal interface between the DASA(R&T) and external advisory panels such as the Board on Army Science & Technology (BAST), the Army Science Board, JASONS, and DARPA. I chair and/or support panel peer reviews of Army programs. Additionally I provide executive leadership in the planning of the Army Science Conference and maintain continuing contact with other government agencies, the academic community and private industry to stay abreast of the latest scientific and engineering developments. I also serve as the representative of the Army's Senior Scientific Professionals (STs) to the Army Staff and support the ST Subpanel of the Executive Review Board and the ST pay pool. I also serve as the Chair of the NATO Sensors & Electronics Technology Panel.
- **April 2016 – August 2016; October 2014 – March 2015; February 2012 – June 2012**, *Edgewood Chemical Biological Center, Aberdeen Proving Ground, Maryland*. Director (Acting), Research and Technology. Provided executive supervision and leadership for the research operations at the Nation's pre-eminent non-medical chemical and biological defense research and development establishment. Exercised management oversight over an expansive chemical and biological surety laboratory (BSL-3) infrastructure; a workforce of approximately 500 scientists, engineers, and professional staff; and a research budget of approximately \$150,000,000.
- **July 2004 – August 2006**, *United States Military Academy, West Point, New York*. Professor of Chemistry in the Department of Chemistry and Life Science, responsible for leading and administering academic programs at the United States Military Academy. Course supervisor for the Analytical, Instrumental Analysis, Inorganic, Spectroscopy, and Independent Research courses. Supervised two military instructor and two civilian Title X professors. Responsible for supervising six Title V laboratory and computer support staff. Served as a Department safety and hygiene officer responsible for compliance with OSHA and EPA regulations. Also served as the Departmental representative to the Laboratory Resource Committee, Faculty Council, Academy Professor search committees, and other Academy-level committees as directed. Served as a primary investigator within the Photonics Research Center conducting research in spectroscopy and laser technologies in support to Army and Defense agencies.
- **July 2000 – July 2003**, *United States Military Academy, West Point, New York*. Director of the Photonics Research Center. The center is a basic and applied research laboratory that conducts research in the applications of laser technology. It is comprised of two staff members and sixteen researchers spanning three academic disciplines: Chemistry, Electrical Engineering and Computer Science, and Physics. As Director, I was responsible for over \$8 million in capital equipment and facilities, a \$250,000 annual operating budget, \$500,000 in additional external funding and setting the research direction of the organization. I also served as the National Research Council (NRC) Laboratory Program Administrator for the Center. As an Academy Professor in the Chemistry Department, I was responsible for teaching and supervising four Assistant Professors in the execution of classroom discussions, laboratory exercises, and course administration for the Introduction to Analytical Chemistry, Instrumental Methods, Introduction to Spectroscopy, and Individual Research elective courses. Additionally, I supervised the resourcing of the laboratory equipment and the department's computer and technology integration program. Over a three-year period, I assisted the Heads of the Departments of Chemistry and Physics in the design and program requirements for the expansion and modernization of the Academy's science building, Bartlett Hall. I acted as an expert in spectroscopy and laser technologies providing technical assistance to Army and Defense agencies, as well as providing instruction to officers and cadets in laser technologies. My academy responsibilities included serving on the Faculty Council, the Moral Awareness

Committee, the Academic Computing and Advisory Committee, the Faculty Research Funding Committee, and the Laboratory Equipment Resource Committee.

- **July 1994 – July 2000**, *United States Military Academy*, West Point, New York. Associate Professor, Assistant Professor, Research Officer, Instructor. During this period I taught introductory and upper-division courses in chemistry as well as conducted basic research in remote optical sensing, Raman spectroscopy, gas-phase vibrational spectroscopy and laser carbonization of polymer films. I was responsible for research in the USMA Photonics Research Center and served as the Associate Director. In addition, I supervised the Undergraduate Research Program, Instrumental Analysis and Advanced Instrumental Analysis courses, and the integration of technology throughout the department. I also served on the Faculty Council, the Moral Awareness Committee, the Academic Computing and Advisory Committee, the Faculty Research Funding Committee, and the Laboratory Equipment Resource Committee.
- **July 1991 – August 1992**, *21st Chemical Company, 82nd Airborne Division*, Ft. Bragg, North Carolina. Company Commander. Responsible for the health, welfare, and mission status of a 150 man separate chemical company capable of worldwide deployment by parachute, air assault, or air land within 18 hours of notification. Responsible for \$24 million in real property, a fleet of 50 vehicles, organizational motor pool, and an annual operating budget of \$30,000.
- **August 1990 – July 1991**, *504th Parachute Infantry Regiment, 82nd Airborne Division*, Ft. Bragg, North Carolina. Regimental Chemical Officer, Assistant Operations Officer. Responsible for the training and chemical defensive posture of a 1500 man parachute infantry regiment and 2500 man brigade task force. Organized and conducted consolidated regimental sniper sustainment training. Responsible for the chemical decontamination and reconnaissance efforts of the brigade during operations Desert Shield and Desert Storm.
- **August 1987 – March 1990**, *1st Battalion, 75th Ranger Regiment*, Hunter Army Airfield, Georgia. Battalion Chemical Officer, Assistant Operations Officer. Responsible for the training and chemical defensive posture of a 750 man special operations Ranger battalion. Responsible for the forecasting and management of \$1.5 million in ammunition annually. Evaluated potential weapon systems for fielding in the 75th Ranger Regiment; namely the Carl-Gustaf recoilless rifle and several replacements for the M60 machine-gun.
- **October 1985 – August 1987**, *3rd Battalion, 19th Infantry Regiment (Mechanized)*, 24th Infantry Division, Ft. Stewart, Georgia. Battalion Chemical Officer, Assistant Operations Officer, Atomic Demolition Target Team Leader. Responsible for the training and chemical defensive posture of a 750 man mechanized infantry task force. Responsible for the forecasting and management of training ammunition, ranges, and facilities. Responsible for the planning and execution of all unit missions involving the use of Atomic Demolition Munitions (ADMs).

FELLOWSHIPS AND SCHOLARSHIPS:

United States Military Academy Fellow to the U.S. Army War College, 2003 - 2004

Department of the Army Graduate Fellowship, The Florida State University, 1992 - 1994

4-year Army ROTC Scholarship, Stetson University, 1981 - 1985

PATENTS, PATENTS FILED, DISCLOSURES:

Gregory W Peterson, Augustus W Fountain, III, Jennifer R Soliz, Adam J Hauser, Use of metal-organic frameworks and metal oxides for sensing chemicals using electrical impedance spectroscopy, United States Patent Number 10,495,592, filed with the USPTO August 29, 2017, issued December 3, 2019.

Ashish Tripathi, Jason A. Guicheteau, Erik D. Emmons, Steven D. Christesen, Augustus W. Fountain, Darren K. Emge, Phillip G. Wilcox Apparatus and Method to Identify Exogenous and Residue Material From Biometric and Surface Measurements, Disclosed February 8, 2011.

John M. Ingram, Thomas M. Spudich, Augustus W. Fountain III, Light Emitting Element Based on Laser Carbonized Polymer Substrate, U.S. Patent No. 8,587,188; disclosed November 5, 2008; filed in the USPTO on 04/27/2010; issuance allowed on 11/05/2013; issued on 11/19/2013.

Augustus W. Fountain III, John M. Ingram, James A. Nicholson, Development and Optimization of a Laser Carbonized Polyimide Film as a Sensor Substrate for an all Polymer Humidity Sensor, U.S. Patent Number 6,796,166; disclosed December 3, 2002; issuance allowed August 11, 2004; issued September 28, 2004.

BOOKS or BOOK CHAPTERS:

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30. Dinetz, Stephen F.; Bird, Elliot J.; Wagner, Raymond L.; Fountain, Augustus W. III Thermal and UV Laser Pyrolysis of the Polyimide PMDA-ODA: Analysis of the Gaseous Products by Time-Resolved and Discrete Infrared Spectroscopy Proceedings of the International Symposium on Polyimides and Other High Temperature Polymers, Newark, NJ, December 1999.

NON-REFERED PUBLICATIONS:

1. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; January 2018. https://www.ecbc.army.mil/wp-content/uploads/2019/02/FY18_ILIR_Report.pdf
2. Carl D. Meinhart, Martin Moskovits, Neal D. Kline, and Augustus Way Fountain III, Rapid Detection of Drugs and Explosives for Forensic Analysis, ECBC-TR-1565, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, December 2018. <https://apps.dtic.mil/docs/citations/AD1065041>
3. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2017. https://www.ecbc.army.mil/wp-content/uploads/2018/04/FY17_ILIR_Report.pdf
4. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2016. https://www.ecbc.army.mil/wp-content/uploads/2018/04/FY16_ILIR_Report.pdf
5. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2015. <https://www.ecbc.army.mil/wp-content/uploads/2018/04/FY15-ECBC-ILIR-Report-2015.pdf>
6. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2014. <https://www.ecbc.army.mil/wp-content/uploads/2018/04/FY14-ECBC-ILIR-Report-2014.pdf>
7. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2013. https://www.ecbc.army.mil/wp-content/uploads/2018/04/2013_ILIR_Report.pdf
8. Proceedings of the Edgewood Chemical Biological Center In-House Laboratory Independent Research and Surface Science Initiative Programs; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2012. https://www.ecbc.army.mil/wp-content/uploads/2018/04/2012_ILIR_Report.pdf
9. Annual Report of the Edgewood Chemical Biological Center In-House Laboratory Independent Research Program; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2011. https://www.ecbc.army.mil/wp-content/uploads/2018/04/2011_ILIR_Report.pdf
10. Annual Report of the Edgewood Chemical Biological Center In-House Laboratory Independent Research Program; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2010. https://www.ecbc.army.mil/wp-content/uploads/2018/04/2010_ILIR_Report.pdf
11. Annual Report of the Edgewood Chemical Biological Center In-House Laboratory Independent Research Program; Edgewood Chemical Biological Center; Aberdeen Proving Ground, MD; February 2009. https://www.ecbc.army.mil/wp-content/uploads/2018/04/2009_ILIR_Report.pdf
12. Fountain, Augustus W. III, Technically Speaking: How the explosives detectors at airports work, Army AL&T Magazine, April-June 2015, p. 98 – 99.
13. Fountain, Augustus W. III; Genovese, James; Steinert, Charles; Kreis, Richard; Lyons, Timothy; Cress, James M.; Fritz, Kevin M.; and Murphy, Kevin, Final Report for the Colorimetric Reconnaissance Explosives Squad Screening (CRESS) Kit: Work Performed under Army ATO R.ECB.2010.01 Titled Detection of Unknown Bulk Explosives, ECBC-TR-1263, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, August 2014.

14. Yang, Clayton S.C.; Williams, Barry R.; Tripathi, Ashish; Hulet, Melissa S.; Samuels, Alan C.; Domanico, Joseph A.; May, Joseph; Miles, Ronald W., Jr.; and Fountain, Augustus W. III, Spectral Characterization of RDX, ETN, PETN, TATP, HMTD, HMX, and C-4 in the Mid-Infrared Region, ECBC-TR-1243, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, April 2014.
15. Fountain III, A. W., Special Edition Guest Editorial: Chemical, Biological, Radiological, and Explosive Sensing. *Optical Engineering* 2014, 53, (2), 021101-021101.
16. Francis M. D'Amico, Augustus W. Fountain III, Raphael P. Moon, Steven D. Christesen, Ellen L. Holthoff, Mikella E. Hankus, Paul M. Pellegrino, Norman Green, and Erik Emmons, UV Raman Checkpoint Explosives Detection System (CPEDS) Field Technology Assessment, ECBC-TR-1233, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, March 2014.
17. Wilcox, P.G.; Guicheteau, J.A.; Christesen, S.D.; Fountain III, A.W., Semi-Automated Technique for the Detection of Explosive Materials within Fingerprints on Novel Surfaces, ECBC-TR-1189; U.S. Army Edgewood Chemical Biological Center: Aberdeen Proving Ground, MD, February 2013; CLASSIFIED Report.
18. Jason A Guicheteau, Phillip G. Wilcox, Darren Emge, Steven D. Christesen, Augustus W Fountain III, Ashish Tripathi, Erik D Emmons, Raman Chemical Imaging and Biometric Analysis of Explosives-Contaminated Fingerprints, ECBC-TR-1088, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, February 2013.
19. Moon, Raphael P.; Guicheteau, Jason A.; Christesen, Steven D.; Fountain, Augustus W. III; Ginter, Joy; Tokarz, John; Green, Norman; Tripathi, Ashish; Emmons, Erik; and Hung, Kevin, Preparation of Chemical Samples on Relevant Surfaces Using Inkjet Technology, ECBC-TR-1056, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, April 2013.
20. Carl Meinhart, Martin Moskovitz, Brian Piorek, John Day, Seung Joon Lee, Phil Strong, Jason A. Guicheteau, Darren Emge, Steven D. Christesen, Augustus W Fountain III, Detection of Airborne Explosives with High Sensitivity and Specificity, ECBC-TR-1086, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, February 2013.
21. Jason A Guicheteau, Steven D. Christesen, Augustus W Fountain III, Ashish Tripathi, Erik D Emmons, Raman Signatures and Cross Sections for Explosives Detection, ECBC-TR-1085, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, February 2013.
22. Erik D Emmons, Jason A Guicheteau, Augustus W Fountain III, Ultraviolet Surface-Enhanced Raman Scattering for Detection Applications, ECBC-TR-095, Edgewood Chemical Biological Center, Aberdeen Proving Ground, MD, August 2012. (<http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA568658>)
23. Alan R. Ford, Robert D. Waterbury, Darius M. Vunck, Jeremy B. Rose, Thomas B. Blank, Ken R. Pohl, Edwin L. Dottery, Troy A. McVay, Mikella E. Hankus, Ellen L. Holthoff, Paul M. Pellegrino, Steve D. Christesen, Augustus W. Fountain III, Explosives Sensing Using Multiple Optical Techniques in a Standoff Regime with a Common Platform, *Spectroscopy Magazine*, Apr 1, 2011, <http://spectroscopyonline.findanalytichem.com/spectroscopy/Articles/Explosives-Sensing-Using-Multiple-Optical-Techniqu/ArticleStandard/Article/detail/719324>.
24. Roderick R. Kunz, Michelle L. Clark, Kerin E. Gregory, Dennis E. Hardy, Keith E. Krohn and Augustus W. Fountain III, Fate Of Trace Explosive Signatures in Hot Arid Conditions: Implications For Their Tactical Detection TNT, Composition B, and C-4, ECBC-TR-780, Aberdeen Proving Ground, MD, June 2010.
25. Warren Beck, Erik D. Emmons, Jason A. Guicheteau, and Augustus Way Fountain III, Raman Spectroscopy Of Explosives For Detection Of Vehicle Borne Improvised Explosive Devices, ECBC-TR-767, Aberdeen Proving Ground, MD, May 2010.
26. Roderick R. Kunz, Kerin Clow, Dennis Hardy, Keith E. Krohn, and Augustus Way Fountain III, Environmental Persistence of Trace Levels of Nitro Organic Explosive Materials, ECBC-TR-683, Aberdeen Proving Ground, MD, April 2009.
27. Joy M. Ginter, John A. Tokarz III, Augustus W. Fountain III, Dawn Riegner and Sarah Kaplan, Analytical Method Development for the Analysis of Homemade Explosives by Liquid Chromatography–Mass Spectrometry and Capillary Electrophoresis with Diode Array Detection, ECBC-TR-681, Aberdeen Proving Ground, MD, April 2009.

28. Roderick R. Kunz, Kerin Clow, Dennis Hardy, Michael Switkes, Keith E. Krohn, Stanley A. Ostazeski, Jonathan M. Oyler, Augustus Way Fountain III Quantitative Analysis Of Trace Explosive Residues Found at The National Training Center , ECBC-TR-679, Aberdeen Proving Ground, MD, February 2009.
29. Barry R. Williams, Melissa S. Hulet, Jill L. Ruth, Alan C. Samuels, Ronald W. Miles, and Augustus W. Fountain III, Vapor Phase Infrared Studies of the Headspace During the Formation of Urea Nitrate From the Reaction of Aqueous Urea and Nitric Acid, ECBC-TR-627, Aberdeen Proving Ground, MD, May 2008.
30. Patrick J. Gardner and Augustus Way Fountain III, Defense R&D, A variety of classical, new, and emerging identification and detection techniques are being developed for chemical, biological, and explosive threats, SPIE Professional, April 2008, pp 13 – 14. DOI: 10.1117/2.4200804.05.
31. Augustus W. Fountain III, Book Review, Handbook of Raman Spectroscopy. Edited by I. R. Lewis and H. G. M. Edwards, Applied Spectroscopy, 56(3), 83A.
32. Augustus W. Fountain III, Guest Editorial, Applied Spectroscopy, 53(10), 388A.
33. Augustus W. Fountain III, Book Review, Infrared spectral interpretation: a systematic approach. B. Smith. Applied Spectroscopy, 53(6), 208A.
34. Augustus W. Fountain III, Book Review, Molecular Spectroscopy Workbench by E. W. Ciurczak. Applied Spectroscopy, 52(8), 302A.

INVITED CONFERENCE PRESENTATIONS:

1. Augustus Fountain, Neal Kline, Ashish Tripathi, Rustin Mirsafavi, Martin Moskovits, Carl Meinhart, Jason Guicheteau, Combat Forensics: Identification of Bad Actors with the Aid of Microfluidic SERS (Invited), SciX 2017, Reno, NV, 8 – 13 October, 2017.
2. Augustus W. Fountain, Trends and Future Challenges for the CBRNE Detection (Invited), NDIA Annual CBRN Defense Conference and Exhibition, Aberdeen Proving Ground, MD, 2 – 4 August 2016.
3. Augustus W. Fountain, Trends and Future Challenges for the CBRNE Detection (Keynote Plenary), 12th International Symposium on the Protection against Chemical and Biological Warfare Agents, Stockholm, Sweden, 8 – 10 June 2016.
4. Augustus W Fountain, Trends and Challenges for the Detection of HME Threats, Applied Industrial Optics: Spectroscopy, Imaging and Metrology, (Optical Society of America, Washington, DC) 2015/6/7, JW2D. 3.
5. Augustus W. Fountain III, The Great Merger: Integrating Chemical Sensing for Responsive Detection of Future Threats, Plenary Keynote, 22 January 2014, OnSite 2014, Arlington, VA.
6. Augustus Fountain, Raphael Moon, Ashish Tripathi, Jason Guicheteau, Steven Christesen, Development of Trace Explosive Optical Standards for the Evaluation of Stand-off Raman Sensors, FACSS/SciX 2013, Milwaukee, WI, 2013-09-30.
7. Augustus Way Fountain III, Raman Chemical Imaging of Explosive-Contaminated Fingerprints for Forensic Attribution, BIOS, Photonics West, San Francisco, CA, 21 – 26 January 2012, 8219-38.
8. Augustus Way Fountain III, Raman Chemical Imaging of Explosive-Contaminated Fingerprints for Forensic Attribution, Applied Industrial Optics: Spectroscopy, Imaging, & Metrology (AIO), Toronto, Canada, 11 – 14 July 2011, AIWA1.
9. Augustus Way Fountain III, Sensing Impacts of the Fate of Trace Explosives Signatures Under Environmental Conditions, Countering Improvised Explosive Devices in a Long-Term Perspective, NATO SET-175 RSM-015, 06-07 June 2011, Copenhagen, Denmark.
10. Augustus W. Fountain III, 21st Century Challenges for the Detection of CBRNE Threats, PITTCO, 16 March 2011, Atlanta, GA.
11. Augustus W. Fountain III, Sensing Impacts of the Fate of Trace Explosives Signatures, Counter IED Summit, January 24 - 27, 2011, Crystal Gateway Marriott, Virginia.
12. Augustus W. Fountain III, Defense Applications of Raman Spectroscopy, Spectroscopy Magazine Webinar, June 16, 2010.
13. Augustus W. Fountain III, A survey of chemical and explosives detection (Invited Paper), Optically Based Biological and Chemical Detection for Defence V, SPIE Europe Security and Defence, Conference Proceedings of SPIE Volume 7484, Berlin, Germany, 1 September 2009, Paper 7484-2.
14. Jason Guicheteau, Augustus W. Fountain III, Steven Christesen, Erik Emmons, and Ashish Tripathi Research applications of surface-enhanced Raman at the US Army Edgewood Chemical Biological Center, Nanorods

and Microparticles in Homeland Security, Division of Colloid & Surface Chemistry, The 238th ACS National Meeting, Washington, DC, August 16-20, 2009.

15. Augustus W. Fountain III, Multivariate Statistical Classification of Surface Enhanced Raman Spectra of Chemical and Biological Warfare Agent Simulants, 3rd International Conference on Photonic Nanosystems: Nanofabrication & Application of Organic and Inorganic Photonic Systems, Knowledge Foundation, San Francisco, CA, 7 – 8 November 2005.
16. COL David C. Allbee, COL Merrill S. Blackman, MAJ Peter A. Lofy, and LTC Augustus W. Fountain III, The Use of Technology to Facilitate the Interactive Learning of Chemistry at the United States Military Academy, ACS National Meeting, Boston, Massachusetts, 20 August 2002, paper COMP 0097.
17. Augustus W. Fountain III, Optical Detection Strategies for Chemical and Biological Warfare Agents, Florida Annual Meeting and Exposition, Florida ACS Regional Meeting, Orlando, Florida, May 2001, paper 42.
18. B. L. Shoop, B. G. Oldaker, A. W. Fountain III, R. P. Fabrizio II, T. R. Moore, and W. W. Prior, Educating Mid-career managers in science and technology, Invited Presentation in OSA Annual Meeting Technical Digest, 2000, Providence, Rhode Island, October 2000.

INVITED UNIVERSITY PRESENTATIONS:

1. Transforming Defense Basic Research: a Reprise After 14 Years of War, Meredith College, Cary, NC, 14 April 2014.
2. Getting Big Things From Thinking Small: Expectations and Strategic Implications of Nano-, Bio-, and Bionanotechnologies, Regent University, July 2010.
3. Transforming Defense Basic Research, Duquesne University, Spectroscopy Society of Pittsburgh, Pittsburgh, PA, 16 January 2008.
4. Combat Boots and Lab Coats: My Journey as a Soldier Scientist, University of South Carolina, 24 April 2006
5. Combat Boots and Lab Coats: My Journey as a Soldier Scientist, Stetson University, 16 March 2006.
6. Characterization of Photonic Nanostructures used as Surface-Enhanced Raman Substrates for Bacterial Spores, University of Central Arkansas, 11 April 2005.
7. Characterization of Photonic Nanostructures used as Surface-Enhanced Raman Substrates for Bacterial Spores, Armstrong Atlantic State University, 29 November 2004.
8. Analytical Challenges for the Detection of Chemical and Biological Warfare Agents, University of Georgia, 6 November 2002.
9. Analytical Challenges for the Detection of Chemical and Biological Warfare Agents, Rensselaer Polytechnic Institute, 8 April 2002.
10. Remote Optical Detection of Chemical and Biological Warfare Agents, Rensselaer Polytechnic Institute, 10 April 2001.
11. Research for the Army and Beyond, Georgia Southern University, 27 January 1997

SUBMITTED ORAL PRESENTATIONS:

1. Jason Guicheteau, Ashish Tripathi, McKay Allred, Tattianna Olvera, Erik Emmons, Phillip Wilcox, Kevin Hung, Anthony Koertner, Augustus Fountain, Chemical Fingerprint Identification System: Beyond Concept and towards Applications for Field Expeditionary Military Forensic Analysis, SciX 2018, Atlanta, GA, 21-16 October 2018.
2. Ashish Tripathi, Erik D. Emmons, Augustus W. Fountain III, Jason A. Guicheteau, Planar Array Substrate Based Surface Enhanced Raman Spectroscopy: Effect of Metal Types and Geometries on Enhancement and Thermodynamics of Binding, SciX 2017, Reno, NV, 8 – 13 October, 2017.
3. Harris, Coleman; Soliz, Jennifer; Klevitch, Andrew; Rossin, Joseph; Fountain, Augustus, III; Peterson, Gregory; Hauser, Adam, Sensing of NO₂ with Zirconium Hydroxide via Electrical Impedance Spectroscopy, APS March Meeting 2016, abstract #C51.003.
4. Ashish Tripathi, Erik Emmons, Steven Christesen, Augustus Fountain, and Jason Guicheteau, Effect of Ionization of Thiophenol on the Mechanism of Heterogeneous Adsorption on Gold Substrates by Surface-Enhanced Raman Spectroscopy, FACSS/SciX 2013, Milwaukee, WI, 2013-10-02.

5. Charles S. Harden, Gretchen E. Blethen, Christina L. Crawford, Brian S. Ince, Vincent M. McHugh, Augustus W. Fountain III, Herbert H. Hill, Ion mobility spectrometry for detection of explosives, taggants, and related materials using an existing, fielded chemical agent detector: the M4A1-JCAD, Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensing XIII, Baltimore, MD, USA, SPIE.
6. Jason Guicheteau, Steven Christesen, Jerry Caballo, and Augustus, W. Fountain III, Understanding the Role of Physical and Chemical Adsorption on the Raman Enhancement from Metallic Nanoparticles and Nanostructured Surfaces, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, 2011.
7. Steven Christesen, Jason Guicheteau, Norman Green, Raphael Moon, and Augustus Fountain, Generating Optical Standards for Standoff Detection of Explosives, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, 2011.
8. Kevin Shefcheck, John Tokarz, Stanley Ostazeski, and Augustus Fountain, Detection and Characterization of Perchlorate/Sugar Homemade Explosives (HMEs) by Liquid Chromatography - Tandem Mass Spectrometry (LC-MS/MS), Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, 2011.
9. Joy Ginter, Timothy Allan, E. Alex Jestel, Kevin Shefcheck, Stanley Ostazeski, and Augustus Fountain, Determining the Environmental Persistence of Ammonium Nitrate Fuel Oil (ANFO) using Gas Chromatography – Mass Spectrometry (GC-MS) and Ion Chromatography with Conductivity Detection (IC-CD), Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, 2011.
10. Erik Emmons, Steven Christesen, Ashish Tripathi, and Augustus Fountain, Ultraviolet Resonance Raman Spectroscopy of Explosives and Chemical Warfare Agents, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Reno, NV, 2011.
11. Erik David Emmons, Augustus. Fountain, Production of Nanoparticle Substrates of Platinum and Palladium for Ultraviolet Surface-Enhanced Raman Spectroscopy Using Electrode-less Deposition, PITTCON 2010, Orlando, FL, March 2010, (930-66 P)
12. Ashish Tripathi, Erik David Emmons, Jason Guicheteau, Steven Christesen, Phillip Wilcox, Darren K Emge, Augustus W Fountain Detection of Traces of Explosives in Fingerprints with Raman Imaging, PITTCON 2010, Orlando, FL, March 2010, (2020-2).
13. Guicheteau, J., S. Christesen, et al. Raman and Surface-Enhanced Raman for Military Applications. XXII International Conference on Raman Spectroscopy 1267: 1069-1070.
14. William F. Pearman and Augustus W. Fountain, Long Range Standoff Detection of Chemical and Explosive Hazards on Surfaces, PITTCON 2010, Orlando, FL, March 2010, (1830-1).
15. Riegner, D. E., S. H. Kazmi, et al. (2009). Developing an LC-MS analysis protocol for ammonium and urea nitrate. Abstracts of Papers of the American Chemical Society 237: 218-CHED.
16. Guicheteau, J., A. W. Fountain, et al. (2009). COLL 370-Research applications of surface-enhanced Raman at the US Army Edgewood Chemical Biological Center. Abstracts of Papers of the American Chemical Society 238: 370-COLL.
17. Sloop, J., Fountain, A., Weyand, J., Boyle, P., Gomez, C. Synthesis of and Structure-Property Relationships in Novel Triketones, Indanone and Tetralone Derivatives, US Army Research Laboratory (USARL) Technical Symposium, Atlantic City, NJ, 2008.
18. Jason Guicheteau, Steven Christesen, Augustus Fountain III, and Darren Emge, Surface-Enhanced Raman Substrate Comparison, FACSS, Reno, NV, October 2008, paper 443.
19. Augustus W. Fountain III, Explosives Signatures and Analysis, Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 16 - 20 March 2008, Paper 6954-1.
20. Augustus W. Fountain III, Explosives Signatures and Analysis, The 2007 Scientific Conference on Chemical & Biological Defense Research, Timonium, Maryland, 13-15 November 2007.
21. Eric V. Ni, William N. Radicic, and Augustus W. Fountain III, Matrix effects and design considerations for quartz-bound Au nanoparticle SERS substrates in chemical and biological detection Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 9 - 13 April 2007, Paper 6554-6.
22. Edisanter Lo, Augustus W. Fountain III, and John Ingram, Wavelength calibration of hyperspectral sensors with 2D detector arrays Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 9 - 13 April 2007, Paper 6565-46.

23. Edisanter Lo and Augustus W. Fountain III, An algorithm for computing partial pixel in hyperspectral imaging camera calibration, Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 17 - 21 April 2006, Paper 6233-44.
24. Edisanter Lo and Augustus W. Fountain III, An algorithm for wavelength calibration in hyperspectral imaging camera, Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 17 - 21 April 2006, Paper 6233-22.
25. William N. Radicic, Eric V. Ni, Christin Tombrello, Augustus W. Fountain III, Characterizing the spectral reproducibility of quartz-bound Au nanoparticle substrates for surface-enhanced Raman spectroscopy, Defense and Security Symposium, Society of Photo-Optical Instrumentation Engineers, Orlando, FL, 17 - 21 April 2006, Paper 6218-3.
26. William N. Radicic, Christin Tombrello, Augustus W. Fountain III, Characterizing the spectral reproducibility of quartz-bound Au nanoparticle substrates for surface-enhanced Raman spectroscopy, PITTCON 2006, Orlando, FL, 13 – 17 March 2006, Paper 2010-1.
27. A. W. Fountain III and W. F. Pearman, Classification of chemical and biological warfare agent simulants by surface enhanced Raman spectroscopy and multivariate statistical techniques, Chemical and Biological Sensors for Industrial and Environmental Security, Society of Photo-Optical Instrumentation Engineers, Boston, MA, 23 - 26 October 2005, Paper 5994-31.
28. Jay Pendell Jones, Troy Alexander, Nicholas F. Fell, Jr. and LTC Augustus W. Fountain III, Characterization of Photonic Nanostructures used as Surface-Enhanced Raman Substrates for Bacterial Spores, SPIE Vol. 5617, Optically Based Biological and Chemical Sensing for Defence, Society of Photo-Optical Instrumentation Engineers, Bellingham, London, UK, Oct. 27, 2004, Paper 5617-50.
29. Jay Pendell Jones, Nicholas F. Fell, Jr., Troy Alexander, and LTC Augustus W. Fountain III, Photonic Nanostructures as SERS Substrates for Characterizing Bacterial Spores, SPIE Vol. 5416 Chemical and Biological Sensing V, Society of Photo-Optical Instrumentation Engineers, April 2004, Paper 5416-94.
30. Investigation of Nanostructures for Reproducible SERS Characterization of Bacterial Spores, Nicholas F. Fell, Jr., Jay Pendell Jones, Troy Alexander, B. Reis Ritz, and LTC Augustus W. Fountain III, Invited Talk, The 30th Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies, Ft. Lauderdale, FL, 19-23 Oct 2003.
31. Surface-enhanced Raman Substrate Optimization for Bacterial Identification, Nicholas F. Fell, Jr., Troy Alexander, Jay Pendell Jones, Kristl Dorschner, Christin Tombrello, B. Reis Ritz, and LTC Augustus W. Fountain III, Talk, SPIE's 17th Annual International Symposium on Aerospace/Defense Sensing, Simulation, and Controls, Orlando, FL, 21-25 April 2003.
32. Substrate Evaluation and Optimization for Surface-Enhanced Raman Spectroscopy of Bacteria, Nicholas F. Fell, Jr., Troy Alexander, Kristl Dorschner, Christin Tombrello, LTC Augustus W. Fountain III, Poster, 2002 Scientific Conference on Chemical & Biological Defense Research, Hunt Valley, MD, Nov. 19-21, 2002.
33. Melissa Vellone, Nicolas F. Fell Jr., Alicia G. B. Smith, Augustus W. Fountain III, Optimization of Substrates for Surface-Enhanced Raman Spectroscopy of Vegetative Bacteria 29th Annual Conference of the Federation of Analytical Chemistry & Spectroscopy Societies, Providence, Rhode Island, October 2002.
34. John M. Ingram, Michael White, and Augustus W. Fountain III, Development and Optimization of a Laser Carbonized Polyimide Film as a Sensor Substrate, The 29th Annual Conference of the Federation of Analytical Chemistry & Spectroscopy Societies, Providence, RI, October 2002.
35. Augustus W. Fountain III and Laurence Bryson Borgstedt, Gas Phase Infrared Spectra of Organophosphate Chemical Agent Simulants, PITTCON 2002, New Orleans, LA, 20 March 2002, Paper # 2075P.
36. John M. Ingram, James Nicholson, and Augustus W. Fountain III, Development and Optimization of A Laser Carbonized Polyimide Film as a Sensor Substrate for an All-Polymer Humidity Sensor, Second International Symposium on Polyimides and Other High Temperature Polymers, Newark, NJ, December 2001.
37. Nicholas F. Fell, Jr., Alicia G. B. Smith, Melissa Vellone, and Augustus W. Fountain III, Optimization of Substrates for Surface-Enhanced Raman Spectroscopy of Bacteria, Talk #4577-24, SPIE International Symposium on Environmental and Industrial Sensing, Boston, MA, October 28-November 2, 2001.
38. Augustus W. Fountain III, Nicolas F. Fell Jr., Alicia G. B. Smith, Kevin Taylor, and Dylan Mack Detection of Biological Agents Through Surface Enhanced Raman Spectroscopy 28th Annual Conference of the Federation of Analytical Chemistry & Spectroscopy Societies, Detroit, Michigan, October 2001, paper 827.

39. Fountain, Augustus W. III; Van Heusen, Tresa; Sathyamoorthy, Madhankumar; Varco, Jac J.; Salin, Marvin L. NIR and Mid Infrared Reflectance Spectroscopy of Cotton Leaves, 27th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Nashville, Tennessee, September 2000, paper 719.
40. Wagner, R. L; Fountain, Augustus W. III, Thermal and UV-laser Pyrolysis of Kapton: A Comparative Study, International Symposium on Polyimides and Other High Temperature Polymers, Newark, NJ, December 1999.
41. Fountain, Augustus W. III; Szczepanski, Michael P., The Remote Optical Detection of Gas Plume Temperature from Low Resolution Gas Phase Infrared Spectra of Carbon Dioxide, 26th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Vancouver, British Columbia, October 1999, paper 701.
42. Fountain, Augustus W. III; Szczepanski, Michael P. The Remote Optical Detection of Gas Plume Temperature from Low Resolution Gas Phase Infrared Spectra of Carbon Dioxide, Northeastern Regional Meeting of the American Chemical Society, Potsdam, New York, June 1999, paper 164.
43. Salin, Marvin L.; Fountain, Augustus W. III; Lynn, Bert Photoperoxidation of Chlorophyllin: Evidence of a Carboxylated Product, Winter Meeting 1998 of the Society for Free Radical Research, Granada, Spain, November 1998.
44. Alvarez, Luis M.; Shea, Corey; Fountain, Augustus W. III; Salin, Marvin Mechanism of Oxidative Bleaching of Chlorophyllin, ACS Spring National Meeting, San Francisco, California, 1997.
45. Wynn, Gary H.; Cuadrado, Juan A.; Fountain, Augustus W. III; Allbee, David C. UV-Laser Induced Carbonization of Polyimides: Development of Patternable Conducting Carbon Networks and Electrochemical Characterization, 20th Army Science Conference, Norfolk, Virginia, July 1996, paper B-03.
46. Wynn, Gary H.; Fountain, Augustus W. III; Cuadrado, Juan A.; Allbee, David C., Development and Electrochemical Characterization of UV-Lased Induced Conducting Carbon Networks on Polyimides, ACS Spring National Meeting, New Orleans, Louisiana, 1996, paper 566.
47. Fountain, Augustus W. III; Wynn, Gary W.; Cuadrado, Juan A.; Allbee, David C., Laser Induced Carbonization of Polyimides: Electrochemical Characterization, PITTCON, Chicago, Illinois, March 1996, paper 377P.
48. Fountain, Augustus W. III; Mann, Charles K.; Vickers, Thomas J., Routine Wavenumber Calibration of an FT-Raman Spectrometer, PITTCON, New Orleans, Louisiana, March 1995, paper 1048.
49. Fountain, Augustus W. III; Mann, Charles K.; Vickers, Thomas J., Routine Wavenumber Calibration of an FT-Raman Spectrometer, Florida Section American Chemical Society, Orlando, Florida, June 1994, paper 13.

JOB RELATED TRAINING:

Emergency Management - Feb 1991

Hazardous Materials - Aug 1991

Radiological Emergency Management - Feb 1992

Supervisor Development Course - Aug 1999

Leadership Education and Development (LEAD) - Sept 1999

Manager Development Course - Jan 2000

Planning, Programming, Budgeting and Execution (PPBE) - Jan 2008

Contracting Officers Representative - June 2008, January 2014

Science, Technology and Public Policy - 2011

Science & Technology Management (CLE045)

Intellectual Property and Data Rights (CLE068)

Army Acquisition Corps Executive Leadership Program

Fundamentals of Systems Planning, Research, Development and Engineering (SYS 101)

Fundamentals of Systems Acquisition Management Course (AC101)

Technology Readiness Assessment (CLE 021)

PROFESSIONAL SOCIETIES AND HONORS:**Grant review activities:**

DDR&E, SMART Scholarship Panel Member, Chemistry and Chemical Engineering
 DARPA, Source Selection Evaluation Board (SSEB) Member, Panoptic Analysis of Chemical Traces (PACT) Program, 2008
 DDR&E, NSSEFF Panel Chair, Functional Materials, 2008
 Defense Threat Reduction Agency
 Department of Homeland Security, Science and Technology Division, Basic Research Program
 DARPA, BAA07-61, Source Selection Evaluation Board (SSEB) Member, Surface Enhanced Raman Scattering Science and Technology Fundamentals, 2008
 Army Research Laboratory, Army Research Office

- Institute for Collaborative Biotechnologies, Technical Advisory Board
- Institute for Soldier Nanotechnologies, Technical Advisory Board

 Department of Energy, NNSA, NA-22 Program Reviewer
 National Institutes of Health; SBIR program reviewer
 National Science Foundation; explosives detection
 Department of Justice; National Institute of Justice; explosives detection
 Technical Support Working Group (TSWG); explosives detection, homemade explosives

Regular Reviewer for the following journals:

Analytical Chemistry
 Analytical and Bioanalytical Chemistry
 Journal of Physical Chemistry (A, B, & C)
 Applied Spectroscopy
 Royal Society of Chemistry, Analyst
 Sensors and Actuators A (Physical)
 Sensors and Actuators B (Chemical)
 IEEE Sensors
 ACS Nano
 Talanta

Journal of Optical Engineering

Associate Editor, 2013 – 2021

Senior Editor, 2022 - present

Society for Applied Spectroscopy, member since 1992

2006 – 2008	Executive Committee, Member at Large; Nominating Committee
2003 – 2005	Chair, Membership Committee
2000 – 2002	National Executive Committee, Parliamentarian
2001 – 2002	Chair, New York Local Section
2000 – 2001	Chair-Elect, New York Local Section
1999 – 2001	Publication Committee, Journal of Applied Spectroscopy
1999 – 2001	New York Student Awards Chairman
1998 – 2000	New York delegate to the National Meeting

Coblentz Society, member 1994 – present

American Chemical Society

Analytical Division member 2000 – present
 Regular Member 1992 – present
 Student chapter president 1984 – 1985
 Student member 1981–1985

Optical Society of America

2001 – 2021 Member
 2012 – 2021 Senior Member
 2007 – 2009 Meggers Award Committee

SPIE—Society of Photo-Optical Instrumentation Engineers

Member 2005 – present
 Elected Fellow 2014
 Chair, Chemical, Biological, Radiological, Nuclear, and Explosives Sensing Conference,
 Defense and Security Symposium, 2006 – 2018
 Vice-Chair, Defense and Security Symposium, 2019 – 2022

75th Ranger Regiment Association, life member since 1990

U. S. Army Ranger Association, life member since 1988

82nd Airborne Division Association, life member since 1991

United States Army War College Alumni Association, life member since 2004

Chemical Corps Regimental Association, life member since 1998

Association of the United States Army, member 1985 – present

Senior Executive Association, member 2008 – present

Assistant Professor, USMA, appointed August 1995

Associate Professor, USMA, appointed August 1998

Professor of Chemistry, USMA, appointed August 2004

Adjunct Professor of Chemistry and Biochemistry, University of Maryland (Baltimore County), appointed
 December 2007

National Research Council, Postdoctoral Associate Research Advisor, appointed November 2000

2016 Presidential Rank Award – Meritorious Senior Professional, Department of the Army

2013 U.S. Army Research & Development Achievement Award, Deputy Assistant Secretary of the Army (Research and Technology), November 2014, “Raman Chemical Imaging of Explosive Contaminated Fingerprints for Forensic Attribution”, co-awarded to: Jason A. Guicheteau, Ph.D.; Steven D. Christesen, Ph.D.; Phillip Wilcox; Augustus W. Fountain III, Ph.D. (ST)

Distinguished Chemistry Department Alumnus, Stetson University, March 2006.

Eisenhower Series College Program, National Security and Strategy Tour Speaker (2003 – 2004)

Florida Section, American Chemical Society, Best Presentation, Analytical Division, American Chemical Society,
 Annual Meeting, Orlando, Florida, 1994.

Who’s Who in American Colleges and Universities, 1985.

Mortar Board, 1985, National academic and honor association.

Gamma Sigma Epsilon, National chemistry honor society

Beta Beta chapter, Stetson University, inducted 1984

Kappa Iota chapter, United States Military Academy, charter member and faculty sponsor

National Society of Scabbard and Blade, 1984, National military honor society.

Boy Scouts of America

Assistant Scoutmaster, Troop 313, Baltimore Area Council, 2006

Assistant District Commissioner, 2004 – 2006

Faculty, *University of Scouting*, Hudson Valley Council, 2002 & 2003.

Unit Commissioner, 2001 – 2004, *Unit Commissioner of the Year* – 2003.

Woodbadge, NE II-118, Antelope Patrol, 2003

Chairman Cub Pack Committee, 1999 – 2002.

Den Leader, 1998.

Eagle Scout, 1981.

MILITARY RANK: Lieutenant Colonel (Retired)

BRANCH: Chemical Corps /Academy Professor

ACADEMIC RANK: Professor of Chemistry

MILITARY EDUCATION:

2004	United States Army War College (Resident, USMA Fellow)	
1998	Command and General Staff Officers College (Resident)	
1998	Space Operations Course (3Y)	
1995	Combined Arms and Services Staff School	
1992	New Instructor Training Course, USMA (5K)	
1990	Live Chemical Agent Detection and Decontamination	
1990	Chemical and Nuclear Target Analysis Course (5H)	
1990	Chemical Corps Officer Advanced Course	(Honor Graduate)
1989	Airlift of Hazardous Materials Course, USAF	
1988	Jungle Expert Course	
1988	Jumpmaster Course	
1987	Ranger Regimental Indoctrination Program	
1987	Ranger Course	
1986	Atomic Demolition Target Team Leader Course	
1985	Chemical Corps Officer Basic Course	(Honor Graduate)
1982	Airborne Course	

MILITARY AWARDS AND HONORS:

Legion of Merit

Meritorious Service Medal, with two Oak Leaf Clusters

Superior Civilian Service Award

Army Commendation Medal, with three Oak Leaf Clusters

Army Achievement Medal

National Defense Service Medal, (2)

Southwest Asian Service Medal, with two Campaign Stars for *Operations Desert Shield and Desert Storm*

Armed Forces Expeditionary Medal, with Bronze Arrowhead for *Operation Just Cause*

Global War on Terrorism Service Medal

Army Service Ribbon

Saudi Arabian Kuwait Liberation Medal

Kuwaiti Kuwait Liberation Medal

Ranger Tab

Senior Parachutist Badge, with Bronze Combat Jump Star

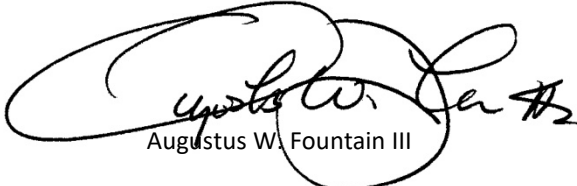
Jordanian Parachutist Badge

Honor Graduate, U.S. Army Chemical Advanced Course, 1990

Honor Graduate, U.S. Army Chemical Basic Course, 1985

Distinguished Military Graduate, Stetson University, 1985

I certify that this document is accurate and true as of July 27, 2023.



Augustus W. Fountain III