Sarah J. Bolton, Ph.D.

Major, United States Air Force
Assistant Professor, Department of Computer and Cyber Sciences
Director, Academy Center for Cyberspace Research
United States Air Force Academy
Academic Curriculum Vitae | Colorado Springs, Colorado | sarah.bolton.compsci@gmail.com

RESEARCH INTERESTS

Applied machine learning for aerospace and cyber data, including aircraft classification, physiological state prediction, and time series modeling of operational signals. Cyber operations and network defense, with attention to AI and ML in operational contexts. Computer science education, with current work on retrieval practice, autograder design, and learning in a generative AI environment. Human and machine teaming and decision support.

EDUCATION

Doctor of Philosophy, Computer Science 2023
Air Force Institute of Technology, Wright Patterson AFB, Ohio
Research emphasis in artificial intelligence and machine learning

Master of Science, Computer Science 2018
Air Force Institute of Technology, Wright Patterson AFB, Ohio
Research focus on artificial intelligence and cognitive measurement

Bachelor of Science, Computer Science 2012
University of Arizona, Tucson, Arizona

ACADEMIC APPOINTMENT

Assistant Professor and Director, ACCR Sep 2023 to Present
Department of Computer and Cyber Sciences, United States Air Force Academy

- Director, Academy Center for Cyberspace Research (ACCR). Coordinate cyberspace research across the Academy, manage research collaborations and CRADAs, and connect cadets and faculty with external partners in government, industry, and academia.
- Coordinator, Cadet Summer Research Program (CSRP). Manage approximately 70 cadet summer research internships annually across DoD laboratories, federally funded research and development centers, and industry partners.
- ABET Lead for CS and Cyber Science Student Outcome 2 (design and evaluation of computing solutions).
- Led procurement and standup of the departmental AI computing cluster supporting cadet and faculty research.

PUBLICATIONS

Peer Reviewed Journal Articles

Bolton, S., Dill, R., Grimaila, M. R., et al. (2023). ADS-B classification using multivariate long short term memory and fully convolutional networks and data reduction techniques. *The Journal of Supercomputing*, 79, 2281 to 2307.

Peer Reviewed Conference Proceedings

Bolton, S., Dill, R., Grimaila, M. R., and Hodson, D. D. (2023). Multi sensor aircraft classification. *2023 Congress in Computer Science, Computer Engineering, and Applied Computing (CSCE)*, Las Vegas, Nevada, pp. 796 to 800.

Bolton, S., Dill, R., Grimaila, M. R., and Hodson, D. D. (2023). Aircraft classification using flight phase identification. *NAECON 2023, IEEE National Aerospace and Electronics Conference*, Dayton, Ohio, pp. 192 to 197.

Under Review

Owen, L. R., Smith, J. B., Shin, E., and Bolton, S. (2026). Predictive modeling of G induced loss of consciousness (GLOC) using physiological data and machine learning. Submitted to *NAECON 2026, IEEE National Aerospace and Electronics Conference*.

Scholarship of Teaching and Learning

Bolton, S., Phan, T., and Crowl, M. (2026). Retrieval practice in action: Reflections on repeated testing in an introductory programming course. *USAFA Scholarship of Teaching and Learning Conference*.

DOCTORAL ADVISING

Dissertation Chair

Patrick Moore, Ph.D. Candidate In Progress

Capitol Technology University

"Using AI to Mine Data and Provide Easily Interpretable Goal Oriented Insights: A Comparative Study"

Balasubramani Venugopal, Ph.D. Candidate In Progress

Capitol Technology University

"Beyond the Horizon: The Future of Scalable and Secure Satellite Communications"

Dissertation Committee Member

Refat Zamkhshri, Ph.D. 2026

Capitol Technology University

"Satellite Ground Station Cybersecurity Challenges and Controls Effectiveness"

RESEARCH LEADERSHIP AND SERVICE

- Director, Academy Center for Cyberspace Research (ACCR). Oversee cyber and aerospace research portfolio, external partnerships, and cadet and faculty research support.
- Coordinator, Cadet Summer Research Program (CSRP). Place approximately 70 cadets per year in summer research internships at DoD labs, FFRDCs, and industry partners.
- Faculty lead, CS405 and CyS405 Senior Colloquium, curating speakers from across the Department of Defense, industry, government, and academia.
- ABET Lead for CS and Cyber Science Student Outcome 2.
- Led procurement and standup of the departmental AI computing cluster.

TEACHING

Course Director for CS210 (Programming Fundamentals in C) and CS220 (Data Structures and Systems Programming), and incoming Course Director for CS380 (Design and Analysis of Algorithms). Vice Chair for CS220, CS380, CS472 (Autonomous Systems Integration), CS314 (Quantum Computation), and CS426 (Languages and Machines). Also teaches CS110 (Introduction to Programming in Python) and the senior CS405 and CyS405 Colloquium. A teaching focused CV is available separately.

PROFESSIONAL DEVELOPMENT AND RECOGNITION

- Dean's Teaching Certificate, United States Air Force Academy.
- Course Design Institute, 2025.
- Mastery of Teaching Certification Community (MTCC), Cohort 8.

MILITARY SERVICE SUMMARY

Major, United States Air Force, with 24 years of continuous service. Commissioned through Officer Training School in March 2013 after 11 years enlisted as an Airborne Spanish Cryptologic Linguist flying on the EC-130H COMPASS CALL and RC-135 RIVET JOINT. Commissioned career spans cyberspace operations and communications leadership, including Officer in Charge of the Network Control Center at the 90th Communications Squadron (F. E. Warren AFB), Flight Commander for Network Operations at the 25th Space Range Squadron (Schriever AFB), and graduate study at the Air Force Institute of Technology. Deployments and missions to Colombia, Ecuador, Afghanistan, Qatar, and Djibouti. A full military assignment chronology is available on request or in the official Air Force biography.

Selected Awards

- Air Medal with one oak leaf cluster
- Aerial Achievement Medal with one oak leaf cluster
- Joint Service Commendation Medal
- Air and Space Commendation Medal with three oak leaf clusters

PROFESSIONAL PROFILES

Google Scholar: scholar.google.com/citations?user=2_rtff4AAAAJ

ResearchGate: researchgate.net/scientific-contributions/Sarah-Bolton-2228137423

LinkedIn: linkedin.com/in/sarah-bolton-547a2019

Teaching site: sjbolton.github.io/teaching-site