Carnegie Mellon University and Carnegie Mellon Institute for Strategy & Technology

in collaboration with the

United States Coast Guard, Assistant Commandant for Intelligence (CG-2)

PRESENTS

AI Bootcamp for USCG Intel Professionals: Implications for National Security

12-14 December 2023

Carnegie Mellon University

www.cmu.edu/cmist

Background

In August 2023, the U.S. Coast Guard Assistant Commandant for Intelligence (CG-2) directed the creation of a workforce development primer on the implications of artificial intelligence to better appreciate its future impacts on both the intelligence community and the broader U.S. Coast Guard.

Webinar Objectives

- Appreciate how artificial intelligence impacts U.S. Coast Guard strategy and intelligence.
- Explain the relationship between artificial intelligence, machine learning, computer vision, and natural language processing within the context of the U.S. Coast Guard intelligence domain.
- Gain knowledge of advancements in the DoD Ethical AI Principles and Responsible AI framework.

Last updated on 12 Dec 2023
***Agenda will be updated regularly to reflect the latest information.**

AI Bootcamp for USCG Intel Professionals: Implications for National Security

Overview

The three-day webinar, developed by Carnegie Mellon Institute for Strategy and Technology (CMIST) in collaboration with the office of the CG-2, will be offered from 1200-1645 on 12,13, and 14 December 2023 to a virtual audience of between 250 and 500 viewers located across various time zones and locations. The audience will principally consist of mid to senior grade officers and non-commissioned officers from the intelligence communities of both the U.S. Coast Guard (USCG) and the U.S. Navy.

The presentations are organized into three modules: 1. Defining AI as a Source of Advantage, 2. National Security Implications of AI, and 3. Technology and Competition. Speakers will include senior leaders, security scholars, policy experts, and scientists. A few highlights include Lt. Gen. Jack Shanahan, USAF (RET), the Honorable Robert O. Work, Professor Audrey Kurth Cronin, and Dean Ramayya Krishnan. Of note, in addition to a traditional read ahead packet, all registrants and presenters will be provided with access to an interactive chatbot prior to the event. The chatbot will enable a guided discussion about the event presentations, as well as featured speakers and their recent publications and public engagements. Additionally, the chatbot will ingest the data from the event itself to serve as the post event knowledge repository.

Day 1: Defining AI as a Source of Advantage

Topics include responsible rules of governance over AI technologies, the structure and history of the AI stack, how AI is shaping intelligence operations, and an overview of the strategic implications of AI. Opening with a panel discussion highlighting the recommendations of the DoD Advisory Board on AI, the module closes with a keynote address by the Honorable Robert O. Work, former Deputy Assistant Secretary of Defense.

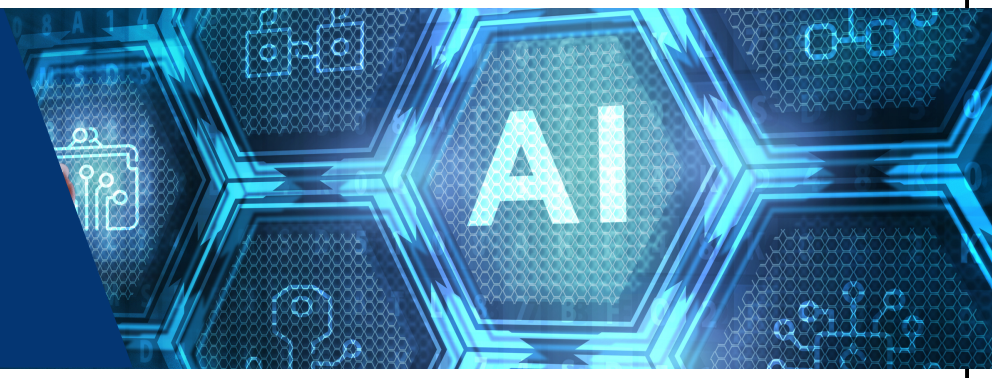
Day 2: National Security Implications of AI

Topics include the operational implications of artificial intelligence, humanmachine teaming and automation, computer vision, and generative AI. Opening with a keynote address by Lt. Gen. Jack Shanahan, USAF (RET), the founding director of the Joint AI Center and Project Maven, the module will focus on cutting edge research.

Day 3: Technology and Competition

Topics include data as a basic building block of AI, evolving commercial technological capabilities, and adversarial AI technological capabilities. The module ends the three-day event with a panel discussion on the future implications of AI on National Security

Agenda



Carnegie Mellon University and Carnegie Mellon Institute for Strategy and Technology
in collaboration with the
United States Coast Guard, Assistant Commandant for Intelligence (CG-2)
Presents

AI Bootcamp for U.S. COAST GUARD Intel Professionals: Implications for National Security

12-14 December 2023

Background

In August 2023, the U.S. Coast Guard Assistant Commandant for Intelligence (CG-2) directed the creation of a workforce development primer on the implications of artificial intelligence to better appreciate its future impacts on both the intelligence community and the broader U.S. Coast Guard.

Webinar Objectives

- Appreciate how artificial intelligence impacts U.S. Coast Guard strategy and intelligence.
- Explain the relationship between artificial intelligence, machine learning, computer vision, and natural language processing within the context of the U.S. Coast Guard intelligence domain.
- Gain knowledge of advancements in the DoD Ethical AI Principles and Responsible AI framework.

AI Bootcamp for USCG Intel Professionals: Implications for National Security

Overview

The three-day webinar, developed by Carnegie Mellon Institute for Strategy and Technology (CMIST) in collaboration with the office of the CG-2, will be offered from 1200-1645 on 12,13, and 14 December 2023 to a virtual audience of between 250 and 500 viewers located across various time zones and locations. The audience will principally consist of mid to senior grade officers and non-commissioned officers from the intelligence communities of both the U.S. Coast Guard (USCG) and the U.S. Navy.

The presentations are organized into three modules: *1. Defining AI as a Source of Advantage*, 2. *National Security Implications of AI,* and 3. *Technology and Competition*. Speakers will include senior leaders, security scholars, policy experts, and scientists. A few highlights include Lt. Gen. Jack Shanahan, USAF (RET), the Honorable Robert O. Work, Professor Audrey Kurth Cronin, and Dean Ramayya Krishnan. Of note, in addition to a traditional read ahead packet, all registrants and presenters will be provided with access to an interactive chatbot prior to the event. The chatbot will enable a guided discussion about the event presentations, as well as featured speakers and their recent publications and public engagements. Additionally, the chatbot will ingest the data from the event itself to serve as the post event knowledge repository.

Day 1: Defining AI as a Source of Advantage

Topics include responsible rules of governance over AI technologies, the structure and history of the AI stack, how AI is shaping intelligence operations, and an overview of the strategic implications of AI. Opening with a panel discussion highlighting the recommendations of the DoD Advisory Board on AI, the module closes with a keynote address by the Honorable Robert O. Work, former Deputy Assistant Secretary of Defense.

Day 2: National Security Implications of AI

Topics include the operational implications of artificial intelligence, human-machine teaming and automation, computer vision, and generative AI. Opening with a keynote address by Lt. Gen. Jack Shanahan, USAF (RET), the founding director of the Joint AI Center and Project Maven, the module will focus on cutting edge research.

Day 3: Technology and Competition

Topics include data as a basic building block of AI, evolving commercial technological capabilities, and adversarial AI technological capabilities. The module ends the three-day event with a panel discussion on the future implications of AI on National Security.

Agenda

Day 1: 12 Dec, 1200-1630 EST

1200-1205 Admin and Introductions
Dr. Rafael Lopez
CMIST Deputy Director for Security Policy Studies
Ms. Jess Regan
CMIST Chief Strategy and Marketing Officer

1205-1215 Opening Remarks
Dr. Audrey Kurth Cronin
Director Carnegie Mellon Institute for Strategy and Technology

1215-1230 U.S. COAST GUARD Welcome Message
RDML Rebecca Ore (U.S. Coast Guard) (Pre-recorded)
Assistant Commandant for Intelligence, CG-2

Module 1. Defining AI as a Source of Advantage

1230-1330 Responsible AI & Governance Panel

This moderated panel discussion focuses attention on salient questions regarding rules of governance over AI technologies. Among others, topics will include the Biden administration's 30 October Executive Order on Artificial Intelligence.

Moderated by Commander Ken Sauerbrunn
U.S. Coast Guard Military Fellow at Carnegie Mellon University (CMU)

Panelists

Dean Ramayya Krishnan
Dean, Heinz College, CMU

Dr. Rayid Ghani
Co-Lead of the Responsible AI Initiative at CMU

1330-1430 Defining AI

This presentation will focus on the structure and history of the AI stack -- a pioneering visualization of the technology blocks, the concepts of data science, and its basis in compute that defines the "art-of-the-possible" for AI.

Mr. Shane Shaneman
CMU Strategic Director of National Security and Defense

1430-1445 Break

1445-1515 How AI is Shaping the Intel Profession

Dr. John Beieler
Director of Science & Technology
Office of the Director of National
Intelligence

1515-1530 Module 1 Recap and Surveys
Introduction of Keynote
Dr. Rafael Lopez and Ms. Jess Regan

Keynote Address: Strategic Implications of AI

1530-1630 *Former Deputy Secretary of Defense and co-chair of the National Security Commission on Artificial Intelligence, Hon. Robert O. Work will discuss the need to adopt artificial intelligence technologies and strategies to counter security threats to the U.S. posed by strategic competitors.*

Hon. Robert O. Work
Former Deputy Secretary of Defense

Day 2: 13 Dec, 1200-1630

1200-1215 Admin Comments and Introduction of Keynote
Dr. Rafael Lopez and Ms. Jess Regan

1215-1300 Keynote Address

A leading voice in the integration of AI capabilities within the Department of Defense, Lt. Gen. Jack Shanahan, USAF (RET) will discuss his views of how AI is changing the way we think about national defense strategies.

Lt. Gen. Jack Shanahan USAF (RET)
Founding Director of the Joint AI Center and Project Maven

Module 2. National Security Implications of AI

1300-1345 Operational Implications of AI

Dr, Hammes will explore how technology is changing the character of warfare for naval warfare. He will include a discussion of why autonomous weapons are a moral imperative for western nations. He will close with how criminals are using some of the same technology to defeat law enforcement..

Dr. T.X. Hammes, Colonel USMC (RET)
Distinguished Research Fellow,
Institute for National Strategic Studies, National Defense University

1345-1430 Human-Machine Teaming

Dr. Schneider will provide an overview of his research and long history of developing workable technologies using machine-learning, especially as it relates to automation.

Dr. Jeff Schneider
Research Professor
CMU's Robotics Institute and Machine Learning Department

1430-1445 Break

1445-1530 Computer Vision

Dr. Marios Savvides' will discuss the innovative applications for computer vision, including identifying terrorists.

Dr. Marios Savvides
Bossa Nova Robotics Professor of Artificial Intelligence, Electrical, and Computer Engineering, Director, CyLab Biometrics Center

1530-1615 Generative AI: Transfer Learning

Previously a major limitation of Deep Learning was that the requirement for large training sets limited to the scope of applicability, precluding application to many important problems where fewer data resources were available. One of the big, recent advances in generative AI is the ability to train effective models for new problems with small amounts of labeled data because the models build on foundations with useful building blocks formed through earlier training cycles. Along those lines, this talk focuses on a holy grail of machine learning, in particular, the use of Large Language Models to promote transferability of trained neural models.

Dr. Carolyn Rose
Professor of Language Technologies and Human-Computer Interaction

1615-1630 Module 2 Recap and Surveys
Dr. Rafael Lopez and Ms. Jess Regan

Day 3: 14 Dec, 1200-1645

1200-1215 Admin Comments and Introductions
Dr. Rafael Lopez and Ms. Jess Regan

Module 3. Technology and Competition

1215-1300 Data: Building Blocks of AI

Mr. David Steier's analysis will highlight how developments in Artificial Intelligence must be based in data, and focus on data-driven approaches to behavioral change.

Dr. David Steier
Distinguished Service Professor
Heinz College School of Information Systems and Management

1300-1400 Commercial Technology Highlights:

The following presentations will look at examples of current commercial technologies and their potential impact on the national security and intelligence space.

Introduction by Dr. Josh Schwartz, CMIST Assistant Professor

- Today's Autonomous Capabilities
  - Dr. Sanjiv Singh, CEO Near Earth Autonomy
- AI in Wargaming
  - Dr. Tuomas Sandholm, CEO Strategy Robot, Inc.

    Today, military planning settings are not treated in a sophisticated way as imperfect-information games. Instead, in DoD planning, wargaming, C2, and doctrine generation, plans (that is, strategies in game theory terminology) are generated manually based on gut feel, with simulation or table-top exercises sometimes as a support tool. In DoD settings, Red and Blue typically have more possible strategies than the number of atoms in the universe.

Yet only a tiny number of strategies for Red (typically 1-5) and for Blue (typically 1-100) are tested. So, only a vanishingly small portion of the strategy space is evaluated, causing enormous risks and overestimation of the strength of Blue's strategies (because Red's strategy space is not fully explored) and leaving significant opportunities on the table (because Blue's strategy space is not fully explored). Also, today's military plans are typically deterministic, while randomization is sometimes needed to make strategies non-exploitable (as a simple example, consider Rock-Paper-Scissors). Furthermore, hiring people to play Red in training, and hiring humans to do planning, is costly and slow for the DoD.

In contrast, Strategy Robot, Inc.'s computational game theory AI tools compute optimal—superhuman—strategies for Blue and Red simultaneously, taking into account that Blue's optimal strategy depends on Red's strategy and Red's optimal strategy depends on Blue's strategy. So, unlike in simulation, the players' strategies are output rather than input. Strategy Robot develops and deploys the world's leading computational game theory AI products for defense and other government applications. The applications range from strategic to operative to tactical, and go across domains. They include wargaming, COA generation, planning and replanning, C2, doctrine optimization, portfolio planning, deterrence, multi-base defense, training, evaluation, and missile defense and offense. The company works all the way up to the TS/SAP level.

1400-1415 Break

1415-1500 Adversarial AI Technology Capabilities

Dr. Cronin provides an analysis of adversarial AI capabilities, with a special focus on the People's Republic of China, as well as assessing effective strategic responses.

Introduction by Dr. Justin Canfil, CMIST Assistant Professor

Hon. Patrick M. Cronin
Asia-Pacific Security Chair at Hudson Institute

1500-1530 Looking Forward

Dr. Kurth Cronin provides a broad assessment of strategic threats and opportunities emerging from the development of advanced technologies.

Dr. Audrey Kurth Cronin
Director Carnegie Mellon Institute for Strategy and Technology

1530-1625 Looking Forward, A Panel Discussion
moderated by Dr. Audrey Kurth Cronin

Panelists
Lt. Gen. Jack Shanahan, USAF (RET)
Founding Director of the Joint AI Center and Project Maven

Dr. Bryan Pendleton
Chief Data Officer, DHS Office of Intelligence and Analysis

Dr. Theresa Mayer (Invited)
CMU Vice President for Research

1625-1635 Closing Comments
Mr. Jeff Radgowski
USCG Deputy Assistant Commandant for Intelligence

1635-1645 Closing Surveys
Ms. Jess Regan

Presenters & Panelists

Dr. John Beieler

Dr. John Beieler serves as the Assistant Director of National Intelligence (ADNI) for Science & Technology (S&T). He also serves concurrently as the Director, Science and Technology within ODNI, a role he was selected for in June 2019. In this position, Dr. Beieler serves as the chief representative of the Director of National Intelligence for science and technology, assists the Director in formulating a long-term strategy for scientific advances in the field of intelligence, and chairs the Director of National Intelligence Science & Technology Committee (NISTC).

Prior to this assignment, Dr. Beieler was a program manager at the Intelligence Advanced Research Projects Activity (IARPA) focusing on human language technology, machine learning, and vulnerabilities in artificial intelligence. While at IARPA, Dr. Beieler led the successful creation of two programs, BETTER and SAILS, and was crucial in the establishment of the field of AI Assurance and Security within the Intelligence Community. Before joining IAPRA, Dr. Beieler was research scientist at the Johns Hopkins Human Language Technology Center of Excellence (HLTCOE) and a data scientist at Caerus Associates. In both of these roles, his work focused on machine learning research and the development, deployment, and scaling of large machine learning systems.

John received his doctorate and master's in political science from Pennsylvania State University, and a bachelor's in political science from Louisiana State University.

Recent publications:

- Video: "'Discover Your Calling' featuring Dr. John Beieler," Office of the Director of National Intelligence, June 29, 2022
- SFY2022– 2026 ODNI S&T STRATEGIC PLAN – "Positioning the Intelligence Community for Future Technical Advantage," Office of DNI

Dr. Justin Canfil

Justin K. Canfil is an Assistant Professor at CMIST. A political scientist by training, Dr. Canfil's research concerns the impact of emerging technologies on international law, arms control, and international security. Prior to Carnegie Mellon, he held postdoctoral fellowships at the Belfer Center for Science and International Affairs at the Harvard Kennedy School and the Columbia-Harvard China and the World Program. He also received a Fulbright Scholarship to China. In 2024, he will be a research associate at Princeton's Center on Contemporary China and a Stanton Nuclear Security Fellow at the Council on Foreign Relations in New York. He received a PhD from Columbia University, with a specialization in International Law via Columbia Law School.

AI Bootcamp for USCG Intel Professionals: Implications for National Security

Dr. Audrey Kurth Cronin

Audrey Kurth Cronin is Trustees Professor of Security and Technology and Director of the Carnegie Mellon Institute for Strategy & Technology (CMIST). Cronin's best-known book is How Terrorism Ends: Understanding the Decline and Demise of Terrorist Campaigns (Princeton, 2009), which The New Yorker called a "landmark study." Her latest book, Power to the People: How Open Technological Innovation is Arming Tomorrow's Terrorists (Oxford, 2020), analyzes emerging technologies and devises a new framework for analyzing 21st century military innovation. It was short-listed for the Lionel Gelber prize and won the 2020 Neave prize.

Cronin was a Marshall Scholar from Princeton, earned a DPhil from Oxford, and was a postdoctoral fellow at Harvard. Formerly Distinguished Professor at American University, she founded and directed the Center for Security, Innovation and New Technology in Washington, DC. She also gained accreditation, founded, and ran the International Security graduate program at George Mason University. She has been director of the core course on War and Statecraft at the National War College, Director of Studies for the Changing Character of War program at Oxford University, and Specialist in Terrorism at the Congressional Research Service. She has also served in the Office of the Secretary of Defense for Policy and frequently advises at senior levels. She was Chairman of the World Economic Forum's Global Agenda Council on Terrorism and is a life member of the Council on Foreign Relations.

Recent publications:

- "Hamas's Asymmetric Advantage: What Does It Mean to Defeat a Terrorist Group?," Foreign Affairs, 22 November 2023
- Interview: "We Just Saw the Future of War," by Derek Robertson, Politico, 10 October 2023
- "How Israel Can Win: Defeating Hamas Will Require a Strategy that Goes Beyond Revenge," Foreign Affairs, 15 October 2023
- "Open Source Technology and Public-Private Innovation Are the Key to Ukraine's Strategic Resilience," War on the Rocks, 25 August 2023

Hon. Patrick M. Cronin

Patrick M. Cronin is the Asia-Pacific security chair at Hudson Institute. Dr. Cronin's research analyzes salient strategic issues related to US national security goals in the Indo-Pacific region and globally. His current writing touches on protecting national interests and world order despite intensified great-power competition, the enduring North Korea problem, and other state and non-state challenges.

Previously, he was the senior director of the Asia-Pacific Security Program at the Center for a New American Security (CNAS); senior director of the Institute for National Strategic Studies (INSS) at the National Defense University, where he simultaneously oversaw the Center for the Study of Chinese Military Affairs; director of studies at the London-based International Institute for Strategic Studies (IISS); senior vice president and director of research at the Center for Strategic and International Studies (CSIS); and director of research at the US Institute of Peace. During the George W. Bush administration, he was confirmed by the US Senate as the third-highest ranking official at the US Agency for International Development (USAID). He served as an intelligence officer in the US Navy Reserve. He has been an adjunct faculty professor at the University of Virginia, the Johns Hopkins University School of Advanced International Studies, and Georgetown University.

Dr. Cronin has a rich and diverse background in Asia-Pacific security and US defense, and foreign and development policy. Before leading INSS, Dr. Cronin served as the director of studies at the London-based International Institute for Strategic Studies (IISS). At IISS, he also served as editor of the Adelphi Papers and as the executive director of the Armed Conflict Database. Before joining IISS, Dr. Cronin was senior vice president and director of research at the Center for Strategic and International Studies (CSIS).

In 2001, Dr. Cronin was confirmed by the United States Senate to the third-ranking position at the US Agency for International Development (USAID). While serving as assistant administrator for policy and program coordination, Dr. Cronin also led the interagency task force that helped design the Millennium Challenge Corporation (MCC).

From 1998 until 2001, Dr. Cronin served as director of research at the US Institute of Peace. Prior to that, he spent seven years at the National Defense University, first arriving at INSS in 1990 as a senior research professor covering Asia and long-range security issues. He was

Hon. Patrick M. Cronin

the founding executive editor of Joint Force Quarterly, and subsequently became deputy director and director of research at the Institute. He received the Army's Meritorious Civilian Service Award upon departure from NDU in 1997.

He has also been a senior analyst at the Center for Naval Analyses, a US Naval Reserve intelligence officer, and an analyst with the Congressional Research Service and SRI International. He was associate editor of Strategic Review and worked as an undergraduate at the Miami Herald and the Fort Lauderdale News.

Dr. Cronin has taught at Georgetown University's Security Studies Program, Johns Hopkins University's Paul H. Nitze School of Advanced International Studies (SAIS), and the University of Virginia's Woodrow Wilson Department of Government.

He read international relations at St. Antony's College, the University of Oxford, where he received both his MPhil and DPhil degrees, and graduated with high honors from the University of Florida. He is a frequent contributor to The Straits Times (Singapore) and DongA Ilbo (South Korea), and is a regular member of the Defense & Aerospace Report's "Washington Roundtable" podcast. He also writes for other leading publications and regularly conducts television and radio interviews.

Recent publications:

- "China's Gambit for Total Information Dominance: A US-Australia Response," Hudson Institute, July 2021
- "Less confrontation, more cooperation: A clear mantra for US defense strategy," East Asia Forum Quarterly , March 2021

Dr. Rayid Ghani

Rayid Ghani is a Distinguished Career Professor in the Machine Learning Department and the Heinz College of Information Systems and Public Policy at CMU.

Rayid is a reformed computer scientist and wanna-be social scientist, but mostly just wants to increase the use of large-scale AI/Machine Learning/Data Science in solving large public policy and social challenges in a fair and equitable manner. Among other areas, Rayid works with governments and nonprofits in policy areas such as health, criminal justice, education, public safety, economic development, and urban infrastructure. Rayid is also passionate about teaching practical data science and started the Data Science for Social Good Fellowship that trains computer scientists, statisticians, and social scientists from around the world to work on data science problems with social impact.

Before joining CMU, Rayid was the Founding Director of the Center for Data Science & Public Policy, Research Associate Professor in Computer Science, and a Senior Fellow at the Harris School of Public Policy at the University of Chicago. Previously, Rayid was the Chief Scientist of the Obama 2012 Election Campaign where he focused on data, analytics, and technology to target and influence voters, donors, and volunteers. In his ample free time, Rayid obsesses over everything related to coffee and works with nonprofits to help them with their data, analytics and digital efforts and strategy.

Recent publications:

- Video: “Distinguished Career Professor, Carnegie Mellon University: ML Is One of Many Disciplines Needed for Prediction Systems,” Chief Data Officer Magazine, December 7, 2022
- “Machine learning and artificial intelligence research for patient benefit: 20 critical questions on transparency, replicability, ethics, and effectiveness,” The BMJ, March 20, 2020
- “Artificial Intelligence for Social Good,” arXiv preprint arXiv:1901.05406. 2019

Dr. T.X. Hammes, USMC Colonel (RET)

Retired US Marine Corps Col. T.X. Hammes is Distinguished Research Fellow at the Institute for National Strategic Studies.

His areas of expertise include future conflict, the changing character of war, military strategy, operational concepts, and insurgency. Dr. Hammes earned a Bachelor of Science from the Naval Academy in 1975 and holds a Masters of Historical Research and a Doctorate in Modern History from Oxford University. He is a Distinguished Graduate from the Canadian National Defence College. He has published three books: Deglobalization and International Security; The Sling and the Stone: On War in the 21st Century, and The 1st Provisional Marine Brigade, the Corps' Ethos, and the Korean War. He has also published over 160 articles. His publications have been used widely in staff and defense college curricula in the US, UK, Canada, Australia, and Singapore. Dr. Hammes has lectured extensively at leading academic and military institutions in the United States and abroad. Prior to his retirement from active duty, Dr. Hammes served 30 years in the Marine Corps to include command of an intelligence battalion, an infantry battalion and the Chemical Biological Response Force. He participated in military operations in Somalia and Iraq and trained insurgents in various locations.

Recent publications:

- "Autonomous weapons are the moral choice," Atlantic Council, November 2, 2023
- "Game-changers: Implications of the Russo-Ukraine war for the future of ground warfare," *Atlantic Council*, April 3, 2023
- "An affordable defense of Asia," *Atlantic Council*, June 18, 2020
- "The Melians' revenge," *Atlantic Council*, June 27, 2019

Dean Ramayya Krishnan

Ramayya Krishnan is the W. W. Cooper and Ruth F. Cooper Professor of Management Science and Information Systems at the H. John Heinz III College and the Department of Engineering and Public Policy at CMU. A faculty member at CMU since 1988, Krishnan was appointed as the Dean in 2009 of the Heinz College.

Krishnan was educated at the Indian Institute of Technology and the University of Texas at Austin. He has a Bachelor's degree in mechanical engineering, a Master's degree in industrial engineering and operations research, and a PhD in Management Science and Information Systems. Krishnan's research interests focus on consumer and social behavior in digitally instrumented environments. His work has addressed technical, policy and business problems that arise in these contexts and he has published extensively on these topics.

He has founded multiple research centers at CMU and is the founding faculty director of the Block Center for Technology and Society. He advises governments and policy making organizations on technology policy and the deployment of data driven policy making. He is an advisor to the President of the Asian Development Bank and is a member of the Geotech Commission of the Atlantic Council. He is an AAAS Fellow (section T), an INFORMS Fellow, an elected member of the National Academy of Public Administration and a distinguished alumnus of both the Indian institute of Technology and the University of Texas at Austin. He served in 2019 as the 25th President of INFORMS, the Global Operations Research and Analytics Society. He was appointed to the National AI Advisory Committee to the President and the AI Initiatives office in 2022. He was appointed chair of the DOD's RAI academic council in 2023.

Recent publications:

- Testimony before US Senate hearing entitled "The Need for Transparency in Artificial Intelligence," September 12, 2023
- "Generative AI: What it really means for business," PwC, April 19, 2023
- Learning Individual Behavior Using Sensor Data: The Case of Global Positioning System Traces and Taxi Drivers, Zhang, Y., Li, B., Krishnan R. (2020), Information Systems Research

Dr. Rafael López

Dr. Rafael López is the Deputy Director for Security Policy Studies at the Carnegie Mellon Institute for Strategy & Technology (CMIST).

As a serial innovator, López has 30+ years of domestic and international experience supporting and leading diverse teams in ambiguous environments.

His research interests include military innovation, organizational adaptation, strategic planning, and implementation management.

López is a recently retired Colonel in the United States Army where he led organizations in peace and conflict supporting both domestic and international initiatives.

He holds a Ph. D. in Foreign Affairs from the University of Virginia and was a Goodpaster Scholar and U.S. Army Strategic Plans and Policy Fellow. He also recently served as the Senior Military Fellow at the National Defense University Institute for National Strategic Studies.

Dr. Theresa Mayer

Theresa S. Mayer is CMU's Vice President for Research, providing leadership for the University's research enterprise and advocating for the role that science, technology, and innovation play nationally and globally.

Theresa holds joint faculty appointments in the Department of Electrical and Computer Engineering and the Department of Materials Science and Engineering in the College of Engineering.

Theresa was previously Purdue University's executive vice president for research and partnerships and a professor of electrical and computer engineering. There she oversaw Purdue's research enterprise.

Mayer served as vice president for research and innovation and a professor of electrical and computer engineering at Virginia Tech. Prior to her role at Virginia Tech, Mayer was at Pennsylvania State University for more than 20 years, where she served as a distinguished professor of electrical engineering, associate dean for research and innovation in the College of Engineering, the site director of the National Science Foundation's National Nanotechnology Infrastructure Network and director of the Materials Research Institute Nanofabrication Laboratory.

She is internationally recognized for her research in applications of nanotechnology to electronic and photonic devices with new and previously unexplored functions. Her work in directed and self-assembly of nanoparticles has been used to expand the types and complexity of materials that can be integrated into devices beyond standard lithographic approaches, enabling a wide range of novel structures from low-power integrated nanosensor circuits to nanostructured gradient index optical components.

She has more than 350 technical publications, invited presentations and tutorials, and holds eight patents. Several of her co-inventions have been transitioned into commercial products. She is a fellow of the Institute for Electrical and Electronics Engineers, and has received numerous awards for her teaching and research, including the NSF CAREER award. Throughout her career, she has supported the advancement of women in science and engineering.

Mayer earned her bachelor's degree from Virginia Tech, and a master's degree and Ph.D. in electrical engineering from Purdue.

Rear Admiral Rebecca Ore

RDML Ore assumed the duties of Assistant Commandant for Intelligence (CG-2), in August 2022. She leads over 1,100 intelligence professionals who conduct collection activities, analysis, production, geospatial intelligence, counterintelligence, cryptology, and associated information technology and security functions.

In her previous assignment as Commanding Officer and Captain of the Port at Coast Guard Sector Los Angeles-Long Beach, she facilitated regional partnerships and provided strategic direction for a team of 550 active duty, reserve, and civilian personnel and a 1,200-member volunteer auxiliary workforce. She was responsible for safeguarding the marine transportation system that flows through the ports of Los Angeles and Long Beach. Together, these two are the largest container ports in the United States and ninth in the world and they move over $1.3 billion of goods per day and receive 40% of cargo entering the country. As the Federal On-Scene Coordinator for the Pipeline 00547 Response in October 2021, she also led a team of 1,800 personnel to mitigate oil impacting northern Mexico and the counties of Orange and San Diego, California.

In prior assignments, RDML Ore implemented maritime safety and security organizations at the international, national, state, and local levels across the spectrum of strategy, policy, budget and operations. She also served as the Director for Maritime Security and Arctic Region Policy on the National Security Council Staff from 2015 to 2017. During this leadership tour of duty, she negotiated international commitments for multilateral cooperation among the eight Arctic states to include terms to achieve global sustainability standards for the Arctic region.

Moreover, her work on maritime policy streamlined and expedited the dissemination of global maritime alerts and warnings as well as aided European allies in managing the maritime migration crisis in the Aegean Sea.

RDML also served in the Pacific Northwest, the Ports of New York and New Jersey, and the Ports of South Louisiana and New Orleans, where she collaborated with maritime communities to resolve complex port and contingency operations. She also worked on policy-related projects at the Office of Management and Budget, and the House of Representatives, where she supported initiatives and shared insights about the collaborations between government regulations, stakeholder priorities, and the flow of maritime commerce.

RDML Ore holds a Bachelor of Science from the U.S. Coast Guard Academy and a Master of Public Administration degree from Princeton University's School of Public and International Affairs. She is a lifetime member of the Council on Foreign Relations, a National Security Affairs Fellow of the Hoover Institution at Stanford University, and a German Marshall Fund Marshall Memorial Fellow.

Dr. Bryan Pendleton

Dr. Bryan Pendleton has served as an employee of the DHS Office of Intelligence and Analysis (I&A) since 2011 and presently serves as Chief Data Officer within the Office of Technology and Data Services. In this role, he is responsible for creating and leading I&A's data strategy, data and information sharing governance, data architecture and engineering, Artificial Intelligence and other advanced analytics. Prior to this role, Pendleton served in several key leadership positions as a career intelligence officer at I&A, DIA, and the US Army. He earned a B.S. in Organizational Leadership and Management from Regent University; an M.B.A. from Baker College; an M.S. in National Security Strategy from the National War College; and a Doctor of Business Administration in Quality Systems Management from the National Graduate School of Quality Management.

Pendleton is a former Harvard Senior Executive Fellow; holds a certificate in leading change in government from Georgetown University; is a certified Lean Six Sigma Black Belt; and a certified Computer Forensic Examiner. He has earned numerous military and civilian awards, most recently receiving the LTG Patrick Hughes award for Homeland Security Intelligence in 2021. Recently, in the Summer of 2023, Bryan earned the Chief Data Officer (CDataO) Executive Certification from CMU and his team was chosen as Best of Cohort.

Mr. Jeff Radgowski

Mr. Radgowski assumed the duties as the Coast Guard's Deputy Assistant Commandant for Intelligence in January 2022. In this capacity, he provides executive direction, leadership, and management to the Coast Guard (CG) Intelligence Enterprise.

Previously Mr. Radgowski served over 30 years as an officer in the CG. From 2018-21 he was the first CG Attaché (COGATT) to Russia from 2016-17, he was the Deputy of the J9 Interagency Partnership Directorate and Director of the Joint Interagency Counter Trafficking Center at European Command. Mr. Radgowski served separately as Deputy & Commander, CG Cryptologic Group, NSA Director's Fellow and the Deputy National Cryptologic Representative (Senior Military) in Afghanistan. He was also the CG's first Acting Senior Defense Official/Defense Attaché and COGATT to Venezuela and the Eastern Caribbean (10 countries), first Intelligence & Operations Liaison Officer to DHS' Domestic Nuclear Detection Office (DNDO), and COGATT Dominican Republic.

His prior engineering assignments include Assistant Facilities Engineer, Training Center Petaluma; Ocean Engineer and Lead Planner, Civil Engineering Unit Oakland; Ship Superintendent, Coast Guard Yard; and Damage Control Assistant aboard USCGC Active.

Mr. Radgowski earned his bachelor's degree in Naval Architecture and Marine Engineering from the U. S. Coast Guard Academy. Additional advanced education includes an M.S. in Ocean Engineering from the University of New Hampshire, an MBA from California State University Hayward, an M.A. in International Relations and Homeland Security from Salve Regina University, and an M.S. in Strategic Intelligence from the National Intelligence University. He completed MIT's National Security and Foreign Policy Seminar XXI and holds a Professional License in Mechanical Engineering for the State of California.

Personal recognition includes nomination as the Coast Guard Engineer of the Year, Runner Up for the LT Root Intelligence Award and for the ADM Billard Intelligence Leadership Award. He received the President of the Dominican Republic's Distinguished Service Medal, the DNDO Director's Special Achievement Award, and the Director of the FBI's Outstanding Service Recognition.

Originally from Portland, ME, he and his wife, Jehan, have a son – Leon, and two daughters – L. C. and Katya.

Recent publications:

- Interview: "A long time Coastie is now the top civilian in Coast Guard intelligence" *Federal News Network*, February 3, 2022

Ms. Jess Regan

Jess Regan serves as the Chief Strategy and Marketing Officer at the Carnegie Mellon Institute for Strategy and Technology (CMIST). With a versatile background, Jess plays a pivotal role in shaping CMIST's public image and amplifying outreach efforts.

Adept at leading cross-functional teams, Jess works towards the creation and implementation of strategic marketing initiatives and events, maintaining brand consistency across all platforms. Prior to CMIST, Jess played a pivotal role as the program specialist at the Center for Security, Innovation, and New Technology at American University, overseeing multifaceted projects, event coordination, budget management, and more. Additionally, she builds upon prior roles as a social media director, professional photographer, and digital designer to spearhead transformative marketing campaigns and craft a captivating brand identity.

Beyond her professional endeavors, Jess's impact extends to community betterment. She has served in several roles on various NGO boards.

With her Master's in Mental Health Counseling from Rollins College and a Bachelor of Arts in both Advertising/Public Relations and Radio/Television Broadcasting from the University of Central Florida, Jess's multidimensional perspective shapes her approach. Her background as a licensed professional counselor, spanning over a decade, adds depth to her holistic perspective and overall approach. Jess’s unique blend of skills help to drive innovation and positive change at CMIST.

Dr. Carolyn Rose

My research program is focused on better understanding the social and pragmatic nature of conversation, and using this understanding to build computational systems that can improve the efficacy of conversation between people, and between people and computers. In order to pursue these goals, I invoke approaches from computational discourse analysis and text mining, conversational agents, and computer supported collaborative learning. I ground my research in the fields of language technologies and human-computer interaction, and I am fortunate to work closely with students and postdocs from the Language Technologies Institute and the Human-Computer Interaction Institute, as well as to direct a lab of my own, called TELEDIA. My group's highly interdisciplinary work, published in over 200 peer reviewed publications, is represented in the top venues in 5 fields: namely, Language Technologies, Learning Sciences, Cognitive Science, Educational Technology, and Human-Computer Interaction, with awards or award nominations in 3 of these fields. An exciting current direction of my group's work is spearheading a satellite working group to support social interaction for learning in MOOCs with EdX called DANCE. My recent article published in Nature can be found here.

My research has birthed and substantially contributed to the growth of two thriving interrelated areas of research: namely, Automated Analysis of Collaborative Learning Processes and Dynamic Support for Collaborative Learning, where intelligent conversational agents are used to support collaborative learning in a context sensitive way. The key idea behind all of my work is to draw insights from rich theoretical models from sociolinguistics and discourse analysis, and pair them down to precise operationalizations that capture the most important essence of what is happening for achieving impact. My approach is always to start with investigating how conversation works and formalizing this understanding in models that are precise enough to be reproducible and that demonstrate explanatory power in connection with outcomes that have real world value. The next step is to adapt, extend, and apply machine learning and text mining technologies in ways that leverage that deep understanding in order to build computational models that are capable of automatically applying these constructs to naturally occurring language interactions. Finally, with the technology to automatically monitor naturalistic language communication in place, the final stage is to build interventions that lead to real world benefits.

This approach leads to three aspects included in each project:

- Basic research on discourse analysis in order to identify conversational constructs that predict important group outcomes such as learning, knowledge transfer, or motivation.
- Basic research on text classification technology for automated analysis of conversational constructs identified under Research on Discourse Analysis as well as tools to enable other researchers to do the same.

Dr. Carolyn Rose

- Basic research on conversational agent technology and other technology that eases development of support triggered by automatic analyses from Basic Research on Text Classification that either enable human facilitators to offer support, directly provide feedback to groups, or behave in such a way as to influence group participation in positive ways.

In an effort to arrive at generalizable models, I am pursuing this research program in multiple parallel contexts that provide opportunities to investigate how both the manifestation of the conversational constructs as well as their effects on outcomes are nuanced through mediating contextual variables. Thus, I am conducting research on eight currently funded projects from a variety of government and industrial funding sources, such as NSF, NRL, and Google. Since my tenure review in 2013, I have served as PI on 3 newly funded grants totaling 2.5M and Co-PI on 6 others totaling 8M. This includes most recently a 4M NSF DIBBS grant on which I am Co-PI and a 2M NSF BigData grant on which I am PI. Most of these projects fall within my primary impact area of education and learning more broadly, including informal learning and knowledge diffusion in online communities such as Wikipedia, GitHub, and Climate Colab.

In my recent service as President of the International Society of the Learning Sciences (now Past President), Executive Board member of the International Artificial Intelligence in Education Society, Steering Committee member of ACM's Learning@Scale, Associate Editor of the International Journal of Computer-Supported Collaborative Learning (now Executive Editor) and the IEEE Transactions on Learning Technologies, I have taken the opportunity to build bridges between research communities that foster and support the multi-disciplinary collaborations that have provided a conducive environment for birthing advances in my own research and those of many others. As part of that effort I recently ran a leadership retreat in Edinburgh in April 2016 to forge a specific, concrete vision for an international umbrella organization to facilitate bridge building and coordination between these related research societies through cross-society awards and cross-community paper presentations. This plan has now been approved by the governing boards of 6 international research organizations in the Learning Sciences and will be officially launched in the coming months.

Recent publications:

- "Enhancing student learning and achievement through orchestration of group processes and group composition," International Journal of Computer-Supported Collaborative Learning, September 9, 2023
- "AI Enabled Mobs for Learning," Mob Mentality Show Podcast, July 20, 2021
- "A social spin on language analysis," Nature, May 11, 2017

Dr. Tuomas Sandholm

Dr. Tuomas Sandholm is Angel Jordan University Professor of Computer Science at CMU and a serial entrepreneur. He is Co-Director of CMU AI. He has published over 500 peer-reviewed papers, holds 27 US patents, and his h-index is 95. In addition to his main appointment in the Computer Science Department, he holds appointments in the Machine Learning Department, Ph.D. Program in Algorithms, Combinatorics, and Optimization (ACO), and CMU/UPitt Joint Ph.D. Program in Computational Biology. He is the Founder and Director of the Electronic Marketplaces Laboratory.

He is Founder, President, and CEO of Strategy Robot, Inc., which develops and deploys the world's leading computational game theory AI products for defense and other government applications. The applications range from strategic to operative to tactical, and go across domains. They include wargaming, portfolio planning, doctrine optimization, deterrence, C2, multi-base defense, training, and missile defense and offense. The company works all the way up to the TS/SAP level.

Sandholm has developed the leading algorithms for several general classes of game. The team he leads is the multi-time world champion in computer heads-up no-limit Texas hold'em, which is the main benchmark and decades-open challenge problem for testing application-independent algorithms for solving imperfect-information games. Their AI Libratus became the first and only AI to beat top humans at that game. Then their AI Pluribus became the first and only AI to beat top humans at the multi-player game. That is the first superhuman milestone in any game beyond two-player zero-sum games.

He is also Founder and CEO of Strategic Machine, Inc., which provides solutions for strategic reasoning under imperfect information in a broad set of applications ranging from poker to other recreational games to business strategy, negotiation, strategic pricing, finance, cybersecurity, physical security, auctions, political campaigns, and medical treatment planning.

In parallel with his academic career, he was Founder, Chairman, first CEO, and CTO/Chief Scientist of CombineNet, Inc. from 1997 until its acquisition in 2010. During this period the company commercialized over 800 of the world's largest-scale generalized combinatorial multi-attribute auctions, with over $60 billion in total spend and over $6 billion in generated savings.

Dr. Tuomas Sandholm

Since 2010, his algorithms have been running the national kidney exchange for the United Network for Organ Sharing, where they autonomously make the kidney exchange transplant plan for 80% of U.S. transplant centers together each week. He also co-invented never-ending altruist-donor-initiated chains and his algorithms created the first such chain. Such chains have become the main modality of kidney exchange worldwide and have led to around 10,000 life-saving transplants. He invented liver lobe and multi-organ exchanges, and the first liver-kidney swap took place in 2019.

He is Founder and CEO of Optimized Markets, Inc., which is bringing a new optimization-powered paradigm to advertising campaign sales, pricing, and scheduling - in TV (linear and nonlinear), Internet display, streaming (video and audio), mobile, game, and cross-media advertising. He served has served as consultant, advisor, or board member for Yahoo!, Google, Chicago Board Options Exchange, swap.com, Granata Decision Systems (now part of Google), Rare Crowds (now part of Media Math), and others.
He holds a Ph.D. and M.S. in computer science and a Dipl. Eng. (M.S. with B.S. included) with distinction in Industrial Engineering and Management Science. Among his honors are the Vannevar Bush Faculty Fellowship, AAAI Award for AI for the Benefit of Humanity, IJCAI John McCarthy Award, Robert S. Engelmore Award, Minsky Medal, Computers and Thought Award, inaugural ACM Autonomous Agents Research Award, CMU's Allen Newell Award for Research Excellence, Sloan Fellowship, NSF Career Award, Carnegie Science Center Award for Excellence, and Edelman Laureateship. He is Fellow of the ACM, AAAI, INFORMS, and AAAS. He holds an honorary doctorate from the University of Zurich.

Read Ahead:

- Strategy Robot: AI Planning Against Intelligent Adversaries

Commander Ken Sauerbrunn

US Coast Guard Fellow, Carnegie Mellon Institute for Strategy & Technology, Commander Ken Sauerbrunn has served as an active duty Coast Guard officer for 17 years, accumulating over 9 years of sea time. Throughout his career, he has distinguished himself as a skilled afloat operator and a financial management specialist.

Prior to beginning the military fellowship at Carnegie Mellon Institute for Strategy & Technology, CDR Sauerbrunn served as Executive Officer aboard U.S. COAST GUARDC ALEX HALEY in Kodiak, AK. Operating in one of the most remote and challenging maritime environments in the nation, he conducted search and rescue missions in protection of the Bering Sea fishing fleet, enforced federal fishing laws, and projected U.S. sovereignty against illegal fishing from maritime competitors in the high latitudes.

CDR Sauerbrunn previously served two tours aboard U.S. COAST GUARDC STURGEON BAY in Bayonne, NJ as Executive Officer and Commanding Officer. There, he conducted icebreaking operations in the Hudson River during the winter months, ensuring the safe passage of fuels and home heating oil to ports between New York City and Albany. He also conducted law enforcement and port security patrols in

New York Harbor and the surrounding waterways. His first afloat assignment was aboard U.S. COAST GUARDC DILIGENCE in Wilmington, NC where he conducted migrant interdiction and counter drug patrols in the Straits of Florida and the Gulf of Mexico.

As a Coast Guard financial management specialist, CDR Sauerbrunn served two tours as a military Comptroller. In these roles, he managed and oversaw the execution of over $120 million in operational spending and facilities maintenance improvements at four major commands: Training Center Cape May, Air Station Atlantic City, Sector Delaware Bay, and Sector New York. He also implemented all federal budgetary, financial, and supply policies at 25 Coast Guard units across five states.

CDR Sauerbrunn graduated from the United States Coast Guard Academy in 2006 with a Bachelor of Science degree in Civil Engineering. He also holds a Masters in Business Administration from the University of Washington, and a Joint Professional Military Education (JPME-1) diploma from the U.S. Naval War College.

CDR Sauerbrunn's professional awards and achievements include the Coast Guard Meritorious Service Medal, two Coast Guard Commendation Medals, two Coast Guard Achievement Medals, the Cutterman's Insignia, numerous unit and team awards, and the Certified Government Financial Manager designation. He and his husband Jonathon enjoy hiking, international travel, and trivia. CDR Sauerbrunn is originally from North Haven, CT.

Dr. Marios Savvides

Professor Marios Savvides is the Bossa Nova Robotics Professor of Artificial Intelligence at CMU and is also the Founder and Director of the Biometrics Center at CMU and a Full Tenured Professor in the Electrical and Computer Engineering Department. He received his Bachelor of Engineering in Microelectronics Systems Engineering from University of Manchester Institute of Science and Technology in 1997 in the United Kingdom, his Master of Science in Robotics from the Robotics Institute in 2000 and his PhD from the Electrical and Computer Engineering department at CMU in 2004.

His research is focused on developing core AI and machine-learning algorithms that were successfully applied for robust face detection, face recognition, iris biometrics, and most recently, general object detection and scene understanding. He and his team were the first in the world to develop a long-range iris capture and matching system capable of acquiring irises up to 12m away in an unconstrained manner. His recent work includes ranking first in Vision for Intelligent Vehicles and Applications competition for hand detection on steering wheels in natural challenging driving conditions. Some of his recent work can detect heavily occluded faces and objects in general under very challenging real-world conditions, developing low-shot object detection and recognition utilizing only a small number of images.

His early achievements include leading the R&D in CMU's participation in NIST's Open Face Recognition Grand Challenge 2005, ranking first in both Academia and Industry. Professor Savvides and his team also participated in NIST's Iris Challenge Evaluation resulting in CMU to rank first in Academia and second against iris commercial vendors. Professor Savvides was then chosen as one of four researchers to form the Office of the Director of National Intelligence's first Center of Academic Excellence in Science and Technology in the area of biometrics and advanced algorithm development.

Professor Savvides spun off a CMU startup called HawXeye with one of his former students where he served as CTO. As the CTO, he assembled a team and led the research and productization of efficient, fast, low-form factor AI algorithms making the current generation of home security cameras smarter where the AI algorithms developed have been deployed to over 3 million ADT home security cameras with a successful exit.

In the last 24 months, he served as the Chief AI Scientist of Bossa Nova Robotics, where he and his CMU research team, completely rebuilt from ground-up the AI algorithms for Bossa

Dr. Marios Savvides

Nova robots for performing real-time inventory analysis and scaling the autonomous robot deployment of this inventory analysis AI from 20 stores to deploying 500 autonomous robots in 500 retail stores while completely removing any Human-in-the-Loop (HITL).

He served as the Vice President of Education for the IEEE Biometric Council in 2015-2016. He also served on the main steering committee and helped co-develop the IEEE Certified Biometrics Professional program.

He has authored and co-authored over 240 journal and conference publications, including 22 book chapters and served as the area editor of the Springer's Encyclopedia of Biometrics. His IP portfolio includes over 40 filed patent applications with 15 issued patents. He is the recipient of seven Best Paper awards. His work in facial recognition was presented at the World Economic Forum in Davos, Switzerland in January 2018. His work has been featured in over 100 news media articles. He is the recipient of CMU's 2009 Carnegie Institute of Technology (CIT) Outstanding Research Award, the Gold Award in the 2015 Edison Awards in Applied Technologies for his biometrics work, 2018 Global Pittsburgh Immigrant Entrepreneur Award in Technological Innovation, the 2020 Artificial Intelligence Excellence Award in "Theory of Mind", the Gold Award in 2020 Edison Awards for Retail Innovations on Autonomous Data Capture and Analysis of On-Shelf Inventory, and the "2020 Outstanding Contributor to AI" award from the US Secretary of the Army Mr. Ryan McCarthy.

Recent publications:

- Interview: "Traders Can't Predict the Market. Maybe Their Faces Can," by Parmy Olson, Washington Post, 17 January 2023
- Video: Demonstration: Long-Range Iris Recognition System, March 24, 2018

Dr. Jeff Schneider

Dr. Jeff Schneider is a research professor in the Robotics Institute of the School of Computer Science at CMU.

Dr. Schneider's research interests are in all areas of machine learning and data mining. He has over 15 years of experience developing, publishing, and applying machine learning algorithms in government, science, and industry. He has over a hundred publications and has given numerous invited talks and tutorials on the subject. Schneider was the co-founder and CEO of Schenley Park Research, Inc. (SPR), a company dedicated to bringing new machine learning algorithms to industry. Later, he developed a new machine-learning based CNS drug discovery system and spent a two-year sabbatical as the Chief Informatics Officer of Psychogenics, Inc. to commercialize the system. During his most recent sabbatical he helped launch Uber's self-driving car program in Pittsburgh where he built autonomy, data science, and machine learning teams.

Schneider works as a consultant on a regular basis. Through his work at CMU and his commercial and consulting efforts, he has worked with several dozen companies and government agencies including ten Fortune 500 companies, and many international groups around the world.

Recent publications:

- "Stealthy Terrain-Aware Multi-Agent Active Search," October 17, 2023
- "Reasoning with Latent Diffusion in Offline Reinforcement Learning," September 12, 2023
- Video: Jeff Schneider, "Self-Driving Cars and AI" February 15, 2019.
- Video: Jeff Schneider, "Computer Vision and Machine Learning Will Transform the Way We Move", May 24, 2017

AI Bootcamp for USCG Intel Professionals: Implications for National Security

Dr. Josh Schwartz

Joshua A. Schwartz is an Assistant Professor in the Carnegie Mellon Institute for Strategy & Technology (CMIST). His research focuses on questions related to the effectiveness of military force and threats, public support for the use of force, and the spread of military technology around the world. Dr. Schwartz has written widely on topics such as the global proliferation of armed drones and their counter-terrorism effectiveness, public support for the use of weapons of mass destruction, the role of gender stereotypes in international politics, and even the limitations of dragon power in Game of Thrones. His academic work has been published or is forthcoming in International Organization, International Security, Journal of Conflict Resolution, International Studies Quarterly, Security Studies, Conflict Management and Peace Science, and Environmental Politics. You can also find his policy commentary in Foreign Affairs, The Washington Post, Bulletin of the Atomic Scientists, Political Violence at a Glance, and Defense One.

Dr. Schwartz is currently working on a book titled, "Dovish Reputation Theory: When Backing Down Makes Sense." This project challenges a widely held rationale for war among policymakers and scholars, which is that states should avoid backing down from conflict because doing so will inevitably harm their future credibility and reputation for resolve. This logic has been used to justify consequential military interventions, such as the Vietnam War, which led to tens of thousands of American deaths and hundreds of thousands of Vietnamese deaths. Instead, Dr. Schwartz argues that choosing to fight rather than back down can sometimes backfire by making adversaries believe that a war-weary country is less likely to stand firm in the future.

Before joining CMU, Dr. Schwartz received his PhD in Political Science from the University of Pennsylvania and his BA in Political Science and Economics from the George Washington University. He was also a Grand Strategy, Security, and Statecraft Predoctoral Fellow at the Harvard Kennedy School, a Grand Strategy Postdoctoral Fellow at the Massachusetts Institute of Technology, a Hans J. Morgenthau fellow at the University of Notre Dame, and a Harry Frank Guggenheim Foundation Emerging Scholar.

Recent publications:

- "Madman or Mad Genius? The International Benefits and Domestic Costs of the Madman Strategy" 2023. Security Studies, Vol. 32, No. 2
- "Do Armed Drones Counter Terrorism, Or Are They Counterproductive? Evidence from Eighteen Countries" 2022. International Studies Quarterly, Vol. 66, No. 3 (with Matthew Fuhrmann and Michael C. Horowitz).

Lt. Gen. Jack Shanahan, USAF (RET)

Lieutenant General John (Jack) N.T. Shanahan, United States Air Force, Retired, retired in 2020 after a 36-year military career. In his final assignment he served as the inaugural Director of the U.S. Department of Defense (DoD) Joint Artificial Center (JAIC). Jack served in a variety of operational and staff positions in various fields including flying, intelligence, policy, and command and control. He commanded at the squadron, group, wing, Agency, and Numbered Air Force levels. As the first Director of the Algorithmic Warfare Cross-Functional Team (Project Maven), Jack established and led DoD's pathfinder AI fielding program charged with bringing AI capabilities to intelligence collection and analysis.

Jack is a 2022 graduate of the North Carolina State University (NCSU) Master of International Studies program and serves on the NCSU School of Public and International Affairs Advisory Council. He is Adjunct Senior Fellow with the Center for a New American Security (CNAS) Technology and National Security Program, and a member of the CNAS Defense Technology Task Force. He is also an advisor to the Special Competitive Studies Project (SCSP) Defense Panel. Jack serves on a variety of AI-related committees, boards, and advisory groups, and as a consultant on the use of AI-enabled technologies for national security.

Recent publications:

- Written Testimony of Lieutenant General John (Jack) N.T. Shanahan (USAF, Ret.) AI Insight Forum: National Security Wednesday, December 6, 2023, 3:00 PM EST

Mr. Shane Shaneman

Shane is the Strategic Director for National Security & Defense at CMU. Shane is responsible for developing and executing strategic activities and initiatives across CMU to accelerate and enhance the impact of its transformational research in robotics, autonomy, engineering, and artificial intelligence across the Department of Defense and the Intelligence Community.

In addition to his primary responsibilities at Carnegie Mellon, Shane is also Adjunct Faculty in the Robotics Institute - focusing on the growing implications and applications of robotics, autonomy, and human augmentation for national security and defense. Shane also serves as the Senior Fellow for Artificial Intelligence with the National Defense Industrial Association (NDIA).

Prior to joining Carnegie Mellon in 2016, Shane worked at the Air Force Research Laboratory as well as multiple technology companies across the Defense Industrial Base between 2000 – 2016, with a focus on strategic planning, innovation, and emerging technologies. Prior to his transition to industry, Shane served in the United States Air Force for 10 years in various operational assignments across Air Force Special Operations Command and Air Combat Command, and research assignments at AFRL and DARPA.

Recent publications:

- "Scaling distributed artificial intelligence/machine learning for decision dominance in all-domain operations," Shane Shaneman, Jemin George, and Carl Busart, Conference Paper, Proceedings of SPIE Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications IV, Vol. 12113, June, 2022
- "The AI stack: a blueprint for developing and deploying artificial intelligence," Andrew W. Moore, Martial Hebert, and Shane Shaneman, Conference Paper, Proceedings of SPIE Ground/Air Multisensor Interoperability, Integration, and Networking for Persistent ISR IX, Vol. 10635, May, 2018

Dr. Sanjiv Singh

CEO & Co-Founder, Near Earth Autonomy, Sanjiv leads the technical and business strategy for the company. He brings 25 years of experience in autonomous ground and air vehicles operating in extreme environments. Key areas of his expertise are in perception and planning for air and ground vehicles. In addition, he specializes in the coordination of teams of (human and robotic) agents performing complex tasks. Sanjiv obtained his PhD in Robotics at CMU in 1995. Near Earth is his third commercial venture.

Mr. David Steier

David Steier is a Distinguished Service Professor in the Heinz College School of Information Systems and Management, where he teaches courses on data science for product management, managing analytics projects, designing smart systems and artificial intelligence.

Prior to joining CMU, David was Managing Director in Deloitte Consulting's Data Science practice. At Deloitte, David helped clients use advanced data analytics and visualization in a variety of industries including health care, banking, retail, manufacturing, telecommunications, media and the public sector. Prior to Deloitte, David held positions as Director in the Center for Advanced Research at PwC, Senior Director of Technology and Business Development at Kanisa, and Managing Director at Scient. David was also a Senior Lecturer at the University of California Berkeley's School of Information, where he was course lead and co-instructor for the data science capstone class in the Masters in Information and Data Science program.

Beyond the general topics of data science and artificial intelligence, David's research interests are in data-driven approaches to behavioral change, particularly in health and wellness.

Hon. Robert O. Work

Secretary Robert O. Work is the Distinguished Senior Fellow for Defense and National Security at the Center for a New American Security and the owner of TeamWork, LLC, which specializes in national security affairs and the future of warfare.

Secretary Work previously served as the Deputy Secretary of Defense, where he was responsible for overseeing the day-to-day business of the Pentagon and developing the Department's $600 billion defense program. He is widely credited for his work with leaders in the Department and the intelligence community on the "Third Offset Strategy," which aimed to restore U.S. conventional overmatch over its strategic rivals and adversaries. He was awarded DoD's Distinguished Public Service Award (twice), the National Intelligence Distinguished Public Service Award, and the Chairman of the Joint Chiefs of Staff Joint Distinguished Civilian Service Award.

Prior to serving as Deputy Secretary, Secretary Work spent one year as CEO of the CNAS, after serving as Undersecretary of the Navy from 2009–2013 in the first Obama administration. As the principal civilian deputy to the Secretary of the Navy, he was responsible for the smooth running of the U.S. naval global business enterprise, with over 500,000 active duty personnel and 200,000 government civilians, and a budget of $160 billion. He was twice awarded the Department of the Navy's Distinguished Civilian Service Award.

After spending 27 years on active duty in the U.S. Marine Corps and retiring as a colonel, Work spent time first as a Senior Fellow and later as Vice President for Strategic Studies at the Center for Strategic and Budgetary Assessments. While there, he authored or co-authored eight major monographs on maritime affairs, defense strategy and technologies, and military operations. He was a regular contributor to defense periodicals and frequently testified before Congress. He was an adjunct professor at George Washington University, teaching roles and missions of the armed forces and defense analysis, and is a member of the International Institute for Strategic Studies, the U.S. Naval Institute, and the Marine Corps Association.

Secretary Work is a Senior Counselor at the Telemus Group. LLC, a consulting firm specializing in defense forecasting, wargaming and qualitative analysis; and a Senior Fellow at the Johns Hopkins University Applied Physics Laboratory, an organization renowned for

Hon. Robert O. Work

systems engineering and integration, technology research and development, and analysis. He is on the Board of Directors for Raytheon, and Board of Advisors for Govini, a big data and analytics firm committed to transforming the business of government through data science.

Secretary Work received his B.S. from the University of Illinois at Champaign-Urbana, an M.S. in Systems Management from the University of Southern California, an M.S. in Systems Technology (Space Systems Operations) from the Naval Postgraduate School, and a Masters in International Public Policy from the Johns Hopkins School of Advanced International Studies.

Secretary Work lives in Northern Virginia with Cassandra, his wife of 39 years. Their daughter, Kendyl, is an analyst at the National Counterterrorism Center.

Recent publications:

- "AI and Synthetic Biology Are Critical to Future U.S. Competitiveness," War on the Rocks, May 27, 2021.
- Transcript: Hon. Robert O. Work, Vice Chair of the National Security Commission on Artificial Intelligence, and Marine Corps Lieutenant General Michael S. Groen, Director of the Joint Artificial Intelligence Center Press Conference, U.S. Department of Defense, April 9, 2021
- "National Security Commission on Artificial Intelligence," March 2021

COMMUNICATION SUPPORT TEAM

Abby Schachter is Fellows Program Manager at Carnegie Mellon Institute for Strategy & Technology (CMIST). She earned her MA in Comparative History from Brandeis University and her BA in European History from McGill University.

Abby is the author of No Child Left Alone: Getting the Government out of Parenting (2016). From 2003 to 2012, she was a member of the editorial board at the New York Post, where she also served as a politics blogger, an op-ed page editor, and the newspaper's books editor. She founded both the Post's Opinion Books feature and Capitol Punishment blog.

Her work appears in the Wall Street Journal, Reason Magazine, the Pittsburgh Tribune-Review, the Pittsburgh Post-Gazette, and Commentary Magazine. She is a former knowledge management specialist at McKinsey & Company and a former marketing associate at Sanford Bernstein and Co.

Abby is raising four children with her artist husband Ben Schachter in Pittsburgh, PA.

Rosalie Woolf is the Event and Program Manager for the Carnegie Mellon Institute for Strategy & Technology. In this role, she plans and executes CMIST events, including but not limited to, our in person and remote lectures, student workshops and events, graduate student orientation sessions, student research and project symposiums, and the CMIST diploma ceremony.

Prior to joining the Carnegie Mellon Institute for Strategy & Technology, she spent five years in the field of international education and study abroad programming. She has a Bachelor's degree in International Studies with a minor in French from Allegheny College and a Master's degree in International Relations from the University of Edinburgh.

AI TOOLS DEVELOPMENT AND SUPPORT TEAM

Vincent Sha has 23 years of IT experience and more than a decade in a leadership role. He has held various roles in support of research and operations before being promoted to CMU's first Associate Dean of IT & Operations. He is an expert in service design, systems implementation and process improvement. He has also consulted across various industries including military and medical simulation with organizations including the Army Research Office, Laerdal, Yale and Harvard. Most recently, he has helped lead development in collaboration with the Provost office to create CMU's newly formed Data Analytics Collaborative to inform the decision-making process at all levels

Dr. Simon Cullen is a cognitive scientist and philosopher at Carnegie Mellon University. He is an affiliated faculty member of CMU's Center for Behavioral and Decision Research and the Center for Informed Democracy and Social-Cybersecurity. He develops practical techniques to resolve political disputes and to improve group reasoning, problem solving, and decision making. He is an international leader in analytical reasoning pedagogy and co-developer of widely used software for developing rigorous arguments. He earned his PhD at Princeton University and completed a postdoctoral research fellowship at Princeton Neuroscience Institute before joining the Philosophy Faculty at CMU.

George Cann has been a part of Carnegie Mellon University's technical support team since 2011, contributing through a variety of roles. Over 13 years, he has transitioned from a general IT Consultant to a Senior Data Analyst at Dietrich College, where he now specializes in data analytics and business intelligence. Skilled in full-stack development, he effectively handles a broad spectrum of IT tasks and projects. Recently, his focus has shifted to applying AI and Large Language Models (LLMs) to practical real-world problems.

Special thanks to Vince, George, and Simon for their insight, hard work, and creativity in building the AI and research tools that are enhancing the webinar.

www.cmu.edu/cmist