



# Redefining the Art of the Possible for Joint All Domain Command & Control (JADC2)

Hanscom Collaboration & Innovation Center's Fall  
Symposium: Academic Panel Session

September 30, 2020  
3:30 pm - 4:30 pm

Software Engineering Institute  
Carnegie Mellon University  
Pittsburgh, PA 15213

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# The Art of the Possible for Joint All Domain Command & Control (JADC2)

**Context:** The Department of Defense (DoD) is focused on building a modern, innovative, and connected joint armed force equipped to defend our nation and global national security interests. The FY21 National Defense Authorization Act (NDAA) has mandated focused acceleration in innovation to enable the Air Force and services to more effectively maintain comparative advantage over adversaries.

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This panel will consider and highlight the following aspects for JADC2:

- The role for Artificial Intelligence in JADC2 Development.
- The role for software, cloud, and virtualization to enable accelerated connectivity and data exchange.
- The challenges of data veracity and data security with accelerated access across information domains and classifications.
- Strategies to help the DoD and military services accelerate innovation across acquisition, policy, technology, and workforce strategies

# Ms. Anita Carleton

## Carnegie Mellon University Software Engineering Institute Software Solutions Division Director

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Anita Carleton is Division Director of the Software Solutions Division at the Carnegie Mellon University Software Engineering Institute where she has more than 30 years of technical and senior leadership expertise in the software engineering industry designing, building, and deploying advanced software technologies for national security.



She leads the software engineering research, development, and transition strategy for the SEI with the specific goal of making software a strategic advantage for the Department of Defense. Carleton is currently leading an SEI effort to engage the broad software engineering community to define a national agenda for software engineering research and development for the next decade.

Carleton serves on the *IEEE Software* Advisory Board and is a Senior Member of the IEEE Computer Society. She is the recipient of the MIT Sloan Leadership Fellowship and has received awards for her work in support of U.S. Air Force programs, from the *Journal of the Quality Assurance Institute* for her leadership in software measurement, and for her leadership in defining the SEI Core Measures/measurement program for the DoD.

# Professor Fiona Murray

MIT Sloan School of Management  
Associate Dean for Innovation & Inclusion

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Fiona Murray is the Associate Dean for Innovation and Inclusion at the MIT Sloan School of Management, the William Porter (1967) Professor of Entrepreneurship, and an associate of the National Bureau of Economic Research. She is also the co-director of MIT's Innovation Initiative.



Murray is an international expert on the transformation of investments in scientific and technical innovation into innovation-based entrepreneurship that drives jobs, wealth creation, and regional prosperity. She has a special interest in the commercialization of science from idea to impact and the mechanisms that can be effectively used to link universities with entrepreneurs, large corporations, and philanthropists in that process.

Through her leadership role in the MIT Regional Entrepreneurship Acceleration Program, Murray engages many global regions in designing and evaluating the policies and programs that shape vibrant innovation ecosystems: prizes competitions, accelerators, and proof of concept funding programs.

# Dr. Kavitha Chandra

University of Massachusetts

Lowell Associate Dean of Engineering for Undergraduate Studies

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Kavitha Chandra is the Associate Dean for Undergraduate Programs in the Francis College of Engineering. As a Professor of Electrical and Computer Engineering, Kavitha does research in algorithms, computer communications (networks), and computing in mathematics, natural science, engineering, and medicine.



Chandra received a doctoral degree in Electrical Engineering from the University of Massachusetts Lowell in 1992. She was a member of the technical staff in the Teletraffic and System Performance Department of AT&T Bell Laboratories and a senior member of the technical staff in the Performance Analysis Department of AT&T Labs from 1994-1998.

Prof. Chandra directs a research program in the Center for Advanced Computation and Telecommunications. She is a senior member of IEEE and member of Acoustical Society of America and Sigma Xi scientific research society.

# Mr. D. Marshall Brenizer

MIT Lincoln Laboratory

Associate Head, Space Systems and Technology Division

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D. Marshall Brenizer is Associate Head of the Space Systems and Technology Division at MIT Lincoln Laboratory. Mr. Brenizer joined Lincoln Laboratory in 2002 as a technical staff member in the Space Control Systems Group, where he helped develop technologies and techniques for space control and space surveillance missions, as well as for terrestrial applications.

In 2007, he moved to the Space Systems Analysis Group, where he worked with organizations in the U.S. space community to develop and critically examine concepts for reducing vulnerabilities to space threats. In 2009, he became the Assistant Leader of the Space Systems Analysis Group, and in 2010, he became the Associate Leader.

His work involved understanding the strengths and weaknesses of U.S. space-related systems, including the sensors and networks used to detect, track, and characterize objects in space, and the infrastructure used to control and operate satellites.

# Dr. David Luzzi

## Northeastern University

### Senior Vice Provost for Research

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Since arriving at the university in 2007 as Dean of the College of Engineering, David has dedicated himself to the success of the university and his Northeastern colleagues. He has contributed to many of the discussions, initiatives and actions that have transformed Northeastern University into a top-tier research university. Under David's leadership, new academic programs were launched, such as the Ph.D. in Bioengineering and the M.S. in Energy Systems.

David is a Full Professor of Mechanical and Industrial Engineering who has authored more than 120 scientific articles. He is a member of the Board of Directors of the Advanced Cyber Security Center and is a Founding Director of the International Cyber Security Center of Excellence. David was a member of the U.S. Air Force Scientific Advisory Board and served as its Science and Technology Chair. He has been awarded the Air Force Meritorious Civilian Service Medal, the Ellis Island Medal of Honor, and the George Heilmeier Award for Research Excellence.

# About the Joint All Domain Command & Control (JADC2)

## What is it?

The Joint All Domain Command and Control (JADC2) is a concept from the DoD that will connect sensors from all of the military services—Air Force, Army, Marine Corps, Navy, and Space Force—into a single network.

## What will it do?

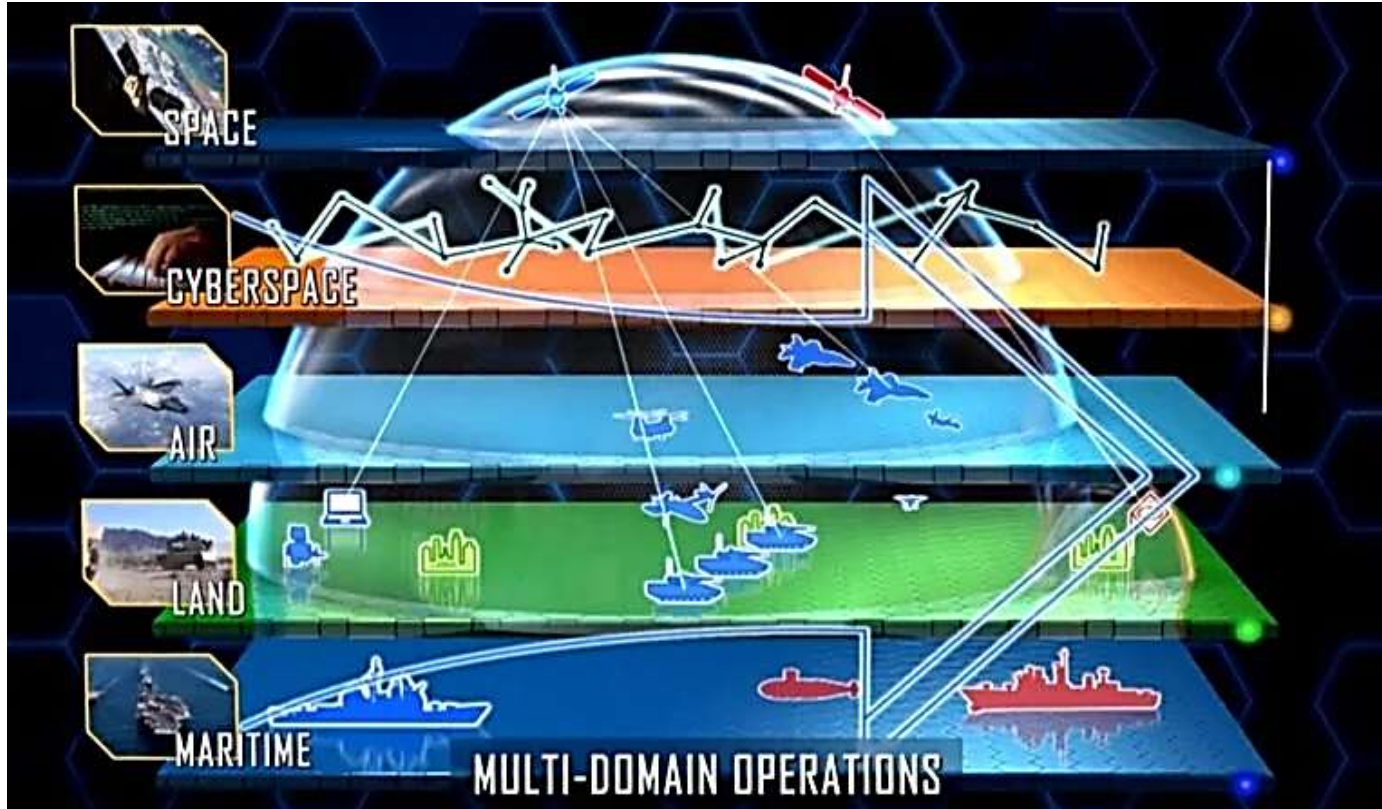
JADC2 intends to enable commanders to make better decisions by collecting data from numerous sensors, processing the data using artificial intelligence algorithms, and using that information to suggest actions, such as identifying targets and recommending optimal weapons—including cyber or electronic weapons.

## How is it being implemented?

The Air Force provides one example of JADC2 implementation through its development of the Advanced Battle Management System (ABMS). ABMS is intended to realize JADC2's vision for enhanced and expanded capabilities by allowing any sensor to inform any shooter in any domain—land, sea, air, space, and cyberspace.



# Multi-Domain Operations, or All Domain Operations, Envisions a New Collaboration Across Land, Sea, Air, Space, and Cyberspace



[https://breakingdefense.com/2020/09/making-war-a-software-problem-jaic-director-on-jadc/Making\\_War\\_A\\_Software\\_Problem:\\_JAIC\\_Director\\_On\\_JADC2](https://breakingdefense.com/2020/09/making-war-a-software-problem-jaic-director-on-jadc/Making_War_A_Software_Problem:_JAIC_Director_On_JADC2)

# Game Plan

- 3:30-3:40 pm Welcome, Introduce Session, Introduce Academic Panelists
- 3:40-3:50 pm **Panel Discussion Topic 1: Key Challenges/Near-Term Actions for Consideration**
- What are some of the key challenges for achieving JADC2 objectives and some near-term actions for consideration?
- 3:50-4:00 pm **Panel Discussion Topic 2: AI/Data/Scalability**
- JADC2 introduces data analysis and management challenges on a scale we've never seen before. Can you discuss concepts being explored in research right now that might help meet this challenge, once matured?
  - How should the best AI capabilities be developed and fielded to ensure maximum impact across all services and domains?
  - How can we ensure that partners in the development of this system have the requisite AI capabilities and access to relevant data?
- 4:00-4:10 pm **Panel Discussion Topic 3: Accelerating Innovation**
- What strategies can DoD Labs and academia offer to help the DoD and military services accelerate innovation across acquisition, policy, technology, and workforce strategies?
  - How can academia help the DoD do more to acquire — and scale — innovative technology?
  - How can we build relevant innovation capabilities/pipelines to help DoD solve the critical future challenges of JADC2?
  - What innovative educational programs and curricula can be developed from JADC2 that encourages and attracts a diverse pool of students to consider potential career pathways in the DoD?
- 4:10-4:25 pm Questions From the Audience
- 4:25-4:30 pm Summary

