# System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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**Implementing a Digital Engineering Environment for Mission Engineering**

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#### Abstract

The US Department of Defense (DoD) has increasingly expanded their focus beyond systems to address the application of systems engineering approaches to ‘missions’. At the same time, the US DoD has emphasized the transformation of systems engineering to a digital, model-based discipline.Bringing these two together, there is strong interest in the development and application of digital engineering environments (DEE) to address mission level system of systems (SoS) requirements, analysis, engineering, and capability portfolio management within and across mission threads. This presentation provides an implementation perspective on the development of a digital engineering environment for Integrated Air and Missile Defense (IAMD), first initiated as a pilot and now transitioning to a sustained capability. The presentation describes the broad mission context driving the development and the approach used to creating the DEE for the J8’s Joint Integrated Air and Missile Defense Organization (JIAMDO). This includes the development of top-level mission threads for IAMD which can be ‘specialized’ to address different ‘mission sets’, including with Counter Unmanned Aerial Systems (C-UAS) as well as Cruise Missile Defense (CMD).

#### Biographies

Dr. Boulware serves as the Technical Director and Deputy Division Chief for the Joint Integrated Air and Missile Defense Organization (JIAMDO) within the J8’s Deputy Directorate for Force Protection (DDFP). As Technical Director, he is the senior scientific and technical advisor to JIAMDO, overseeing research, development, and acquisition associated with integrated air and missile defense. As the Deputy Division Chief, he executes all aspects of the JIAMDO mission to support the Chairman of the Joint Chiefs of Staff (CJCS) by coordinating development of air and missile defense capabilities.

Jason Anderson has over 27 years of experience in leadership, management, programmatic, analytical, and operational roles within the Department of Defense and the Intelligence Community. His expertise includes operations, training, evaluation, research, and congressional outreach across the strategic deterrence, space, homeland defense, special programs, and nuclear command and control mission areas. He has provided analysis and guidance on space and nuclear operations, treaty compliance, program advocacy, requirements development, special access program management, legislative and policy analysis, strategy development, and digital engineering. At MITRE, Jason provides support to the Joint Staff for NC2 and Homeland Defense. Jason has earned degrees in Mathematics, Space Operations, and Public Administration.

Nathan Norwood is a Lead Software Systems Engineer for the MITRE Corporation in the Emerging Technologies department of the Systems Engineering Technical Center. Mr. Norwood has a background in software engineering with a specialty in automating the data exchanges in digital engineering environments. He has been the technical lead in the development of digital engineering capabilities for projects supporting the Army, Navy, Air Force, Joint Staff, and the FAA. Mr. Norwood also has several years of experience developing agent-based force-on-force simulations and applying them to campaign level analysis for CONOPS development and acquisition trades.

Mr. Matthew Cotter is a Lead Systems Engineer with the MITRE Corporation. For the past five years, Matthew has provided systems engineering support to programs within the Department of Defense as well as the Department of Homeland Security. Matthew specializes in the development and application of Modeling and Simulation (M&S) techniques and tools, in the context of systems engineering problems, to help stakeholders effectively explore trades and make decisions early in the system lifecycle. Matthew received his M.S. in Systems Engineering from Worcester Polytechnic Institute, and B.S in Physics from the University of Massachusetts, Amherst.