

**Foundational Research Gaps and Future Directions for Digital Twins**  
**Meeting Agenda: 04/27/23**

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**April 27, 2023**

**OPEN**

- 1:30 p.m.<sup>1</sup> Housekeeping**  
*Karen Willcox*
- 1:30 p.m. Tim Booher (Lockheed Martin Corporation) Presentation**
- 1:40 p.m. Tim Booher Q&A**
- 2:00 p.m. Steve Dennis (International Computer Science Institute) Presentation**
- 2:10 p.m. Steve Dennis Q&A**
- 2:30 p.m. Lea Shanley (International Computer Science Institute) Presentation**
- 2:40 p.m. Lea Shanley Q&A**
- 3:00 p.m. Transition to Closed Session**

**CLOSED**

**3:00 - 3:30 p.m.**

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<sup>1</sup> All times ET

## **SPEAKER BIOGRAPHIES**

**Timothy (Tim) Booher** is Vice President Combat Systems, Aeronautics for Lockheed Martin Corporation. In this capacity, he is responsible for leading the Aeronautics Engineering and Technology Combat Systems team, which develops and sustains all electronic, computational systems enabling combat and mission effectiveness for all platforms across Aeronautics. Responsibilities include leadership through all phases of design, development, delivery, and sustainment of integrated solutions ensuring Aeronautics decisions support the corporate strategy from both a business and technology migration perspective.

Before joining Lockheed Martin, Mr. Booher was HSBC Bank's Global Chief Technology Officer for Cybersecurity where he was responsible for 986M in annual security spend and for the strategy, design, engineering and implementation of security technology across 22 countries, 4 regions, and 3 business units for 40-million customers, 250,000 employees, and 2.7B AUM.

Prior to his tenure at HSBC, Mr. Booher was Colgate-Palmolive's Chief Data and Chief Information Security Officer responsible for the analytics, data strategy, technology architecture and computer security. Before his time at Colgate, Mr. Booher was a program manager for the Defense Advanced Projects Research Agency, where he directed a research portfolio of offensive cyber technologies, data analytics, programming languages, cryptography, formal methods, advanced sensing, and artificial intelligence. He also previously served in the Air Force Red Team at the Air Force Rapid Capabilities Office and the deputy director for technical policy integration for special programs at the Office of the Undersecretary of Defense for Policy. He has led assessments of advanced technology including sensors for intelligence surveillance and reconnaissance, aircraft survivability, directed energy and cyberspace operations. He has also held positions at Headquarters U.S. Air Force (AF/A9, AF/A8, SAF/AQ), the Air Force Research Laboratory (RYS, RWC), the F-15 SPO, Joint Special Operations Command and the Active Materials and Structures Laboratory at the Massachusetts Institute of Technology (MIT).

In a part-time capacity Mr. Booher co-founded three start-up companies and served as a board director and advisor for Google, Team8, Glilot Capital Partners and Forgepoint Capital. He is a judge for the Ansari Xprize. Mr. Booher has degrees in Aeronautics/Astronautics from the Massachusetts Institute of Technology (MIT) and Operations Research from the Air Force Institute of Technology. He holds certificates in Financial Planning from Georgetown University and Computer Security from Carnegie Mellon University.

**Steve Dennis** began his career in computer engineering focusing on the basics of architecture, designing systems with micro-controllers, and creating Very Large Scale Integrated (VLSI) processors to meet the needs of parallel computing applications. He then used these tools and knowledge to explore a variety of applications in machine learning, language processing and pattern recognition for image data. During these years he worked with a wide variety of research architectures and evolving programming languages. He contributed to design and implementation of a variety of chips, computing blades, and systems to better understand the contribution of emerging computing architectures within a multi-disciplined problem-solving domain.

After gaining experience with a wide variety of large-scale computing applications, Steve collaborated with experts from a wide variety of backgrounds in government, academia and industry to develop and deliver new technologies that improve society and simplify our lives. He collaborated with Defense Advanced Research Projects Agency (DARPA) and other federal agencies to manage research in large scale information retrieval, information extraction and machine translation technologies across media. During this time, he served as Technical Director for media processing research leading effort in text, speech, image and video understanding involving multiple research agencies, academic institutions, non-profit and industry research labs.

As the Office of Homeland Security transitioned into a Department, Steve was asked to join the Science and Technology Directorate where he served as research portfolio manager for information analytics. He later served as Technical Director for the Homeland Security Advanced Research Projects Agency (HSARPA). In this role he provided technical and programmatic guidance to a wide variety of highly innovative efforts to advance counter-terrorism and public safety capabilities for the operational components and public safety agencies. He led efforts to automate trade enforcement operations, miniaturize chemical sensing networks and create new methods for leveraging a wide variety of information sources to improve situation awareness for high consequence events.

As the leader for the DHS Advanced Computing Technology Center, Steve created strategies that delivered relevant capability to a wide variety of missions. This work led to significant and measurable innovations for Department operations, as recognized by the Secretary of Homeland Security and a Presidential Rank Award for Meritorious service. As technical executive, Steve represented DHS at the White House and with Congressional staff to develop and promote national strategies that leverage computing and emerging technology frontiers.

Steve's current research interests include the development of strategic methods for characterizing the impact of emerging technologies on society, information sharing and privacy controls, language and media understanding, and process automation. He is

generally interested in the intersection of advancing technologies with real world problem solving and economic development. Recent advancements in computing have led to wide variety of opportunities to improve our world.

Steve is now working with a variety of organizations as a consultant for the development and execution of emerging technology strategy. He is a director and advisor for technology startups, a University of Miami Institute for Data Science and Computing Fellow and a Principal Investigator at the International Computer Science Institute.

**Dr. Lea Shanley** is the Director and CEO of the International Computer Science Institute in Berkeley, California. Dr. Shanley previously served as a White House Presidential Innovation Fellow under the Obama Administration while working at NASA and GSA 18F; a founding co-Executive Director of the NSF South Big Data Innovation Hub; Director of the Wilson Center’s Commons Lab; an AAAS Congressional Science Fellow and science advisor in the US Senate; and co-founder of the Federal Crowdsourcing and Citizen Science Community of Practice, an multi-agency open science community, which resulted in Citizenscience.gov, a White House OSTP Memorandum, a federal statute, and team recognition as a finalist for the 2017 Ash Award by Harvard’s Kennedy School of Government.

Dr. Shanley’s research focuses on bringing spatial technologies, computer-supported cooperative work, and social computing to bear on scientific and societal challenges, as well as on tackling issues in technology policy, including privacy and trust, open data, intellectual property, and data sovereignty. She previously served on the advisory committee for the NASA Socioeconomic Data and Applications Center, on the Scientific Council for the NASA Consortium for the Valuation of Applications Benefits Linked to Earth Science, and on the Board of Trustees for US/ICOMOS (International Committee of Monuments and Sites). She also is a member of the IEEE Indigenous Data Sovereignty Working Group, and the intergovernmental Group on Earth Observations (GEO) Data Working Group, for which she co-chaired their data ethics/law/policy subgroup. Dr. Shanley holds a Ph.D. in Geographic Information Science and Earth observation from the University of Wisconsin-Madison.