Artificial Intelligence for Manufacturing

Workshop

May 27–28, 2026

Gaithersburg, Maryland

Co-Chairs: Yan Lu & Rachael Sexton
Engineering Laboratory, NIST

- **Use Cases**
- **Challenges & Barriers**
- **Standards & Meas. Sci.**

yan.lu@nist.gov | rachael.sexton@nist.gov

Opening Remarks

WELCOME

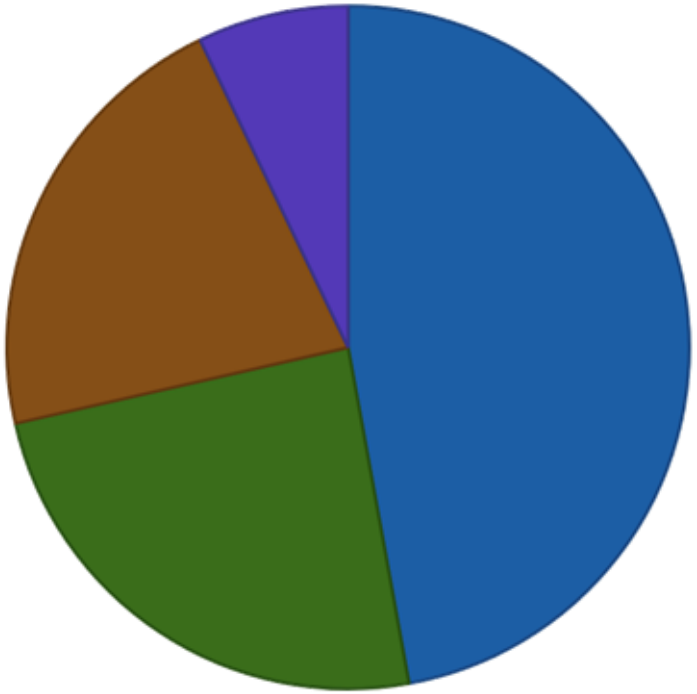
Dr. Joannie Chin

Director, Engineering Laboratory

National Institute of Standards and Technology

Workshop Overview

70 Registrants



- Academia 21%
- Industry 47%
- Government 24%
- Public-Private Partnership 7%

Goal

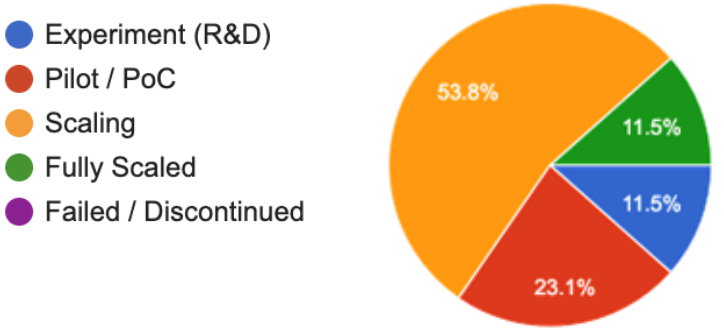
The workshop will convene stakeholders from manufacturing, automation, and digital systems integration sectors to

- collect **real-world use cases** of AI in manufacturing that employ foundation models, agentic AI, and Physical AI;
- document current **challenges and barriers** to implementing AI in manufacturing systems and engineering workflows;
- identify **measurement science and standards** needs to support reliable, resilient, and interoperable AI-enabled manufacturing systems
- Identify specific measurement science and standards needs to enable productive **human-AI teaming** in manufacturing.

Pre-Workshop Use Case Collection Preview

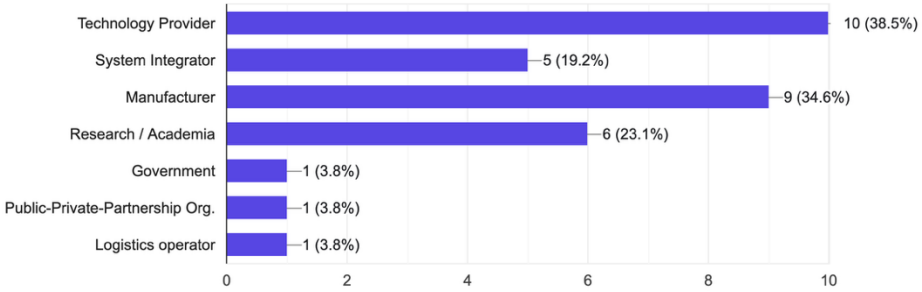
* Deployment Status

26 responses



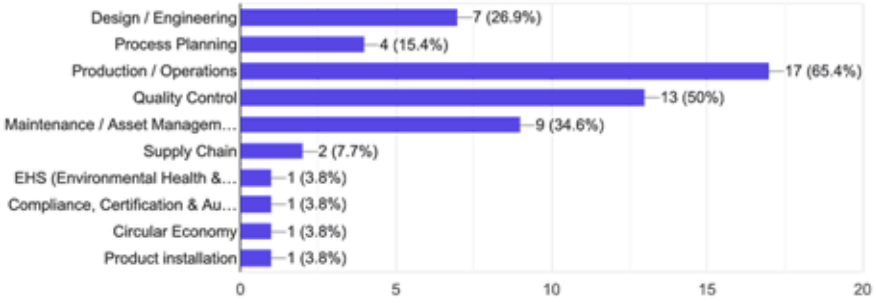
Submission Organization Type

26 responses



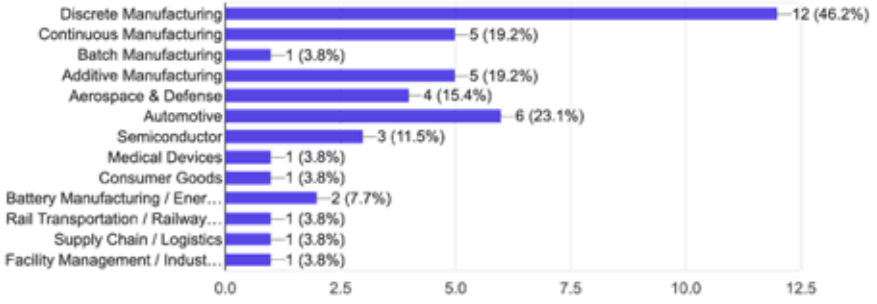
Manufacturing Sub-Domain

26 responses

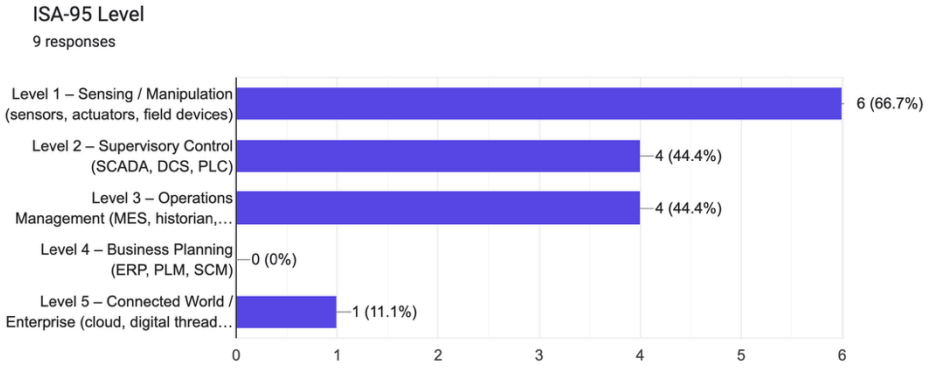


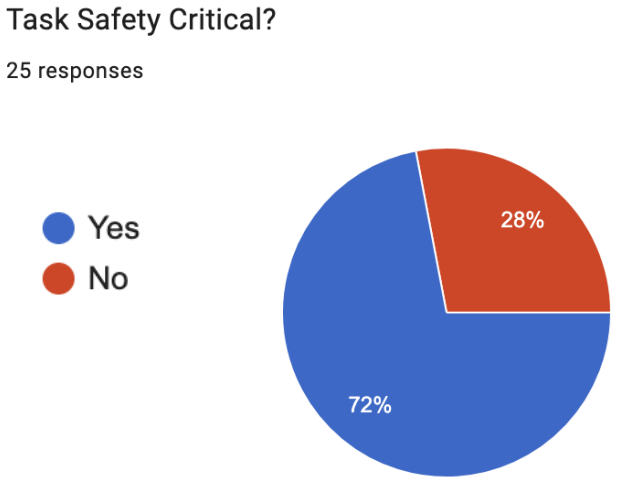
Business Sector

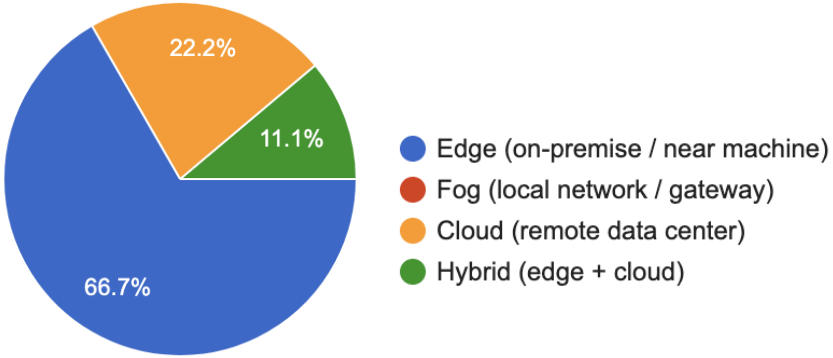
26 responses

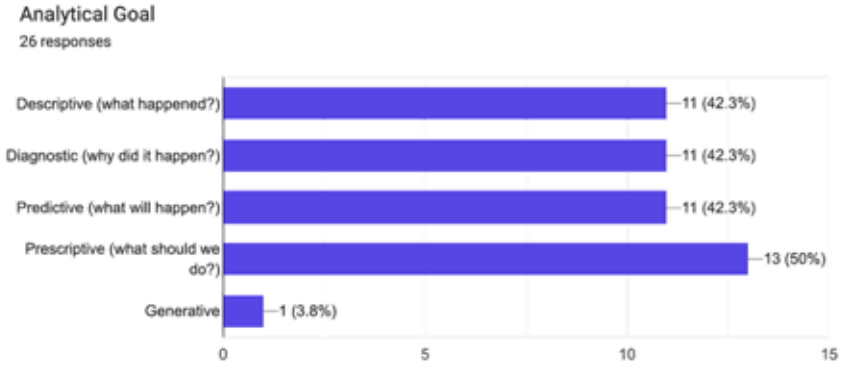


Pre-Workshop Use Case Collection Preview









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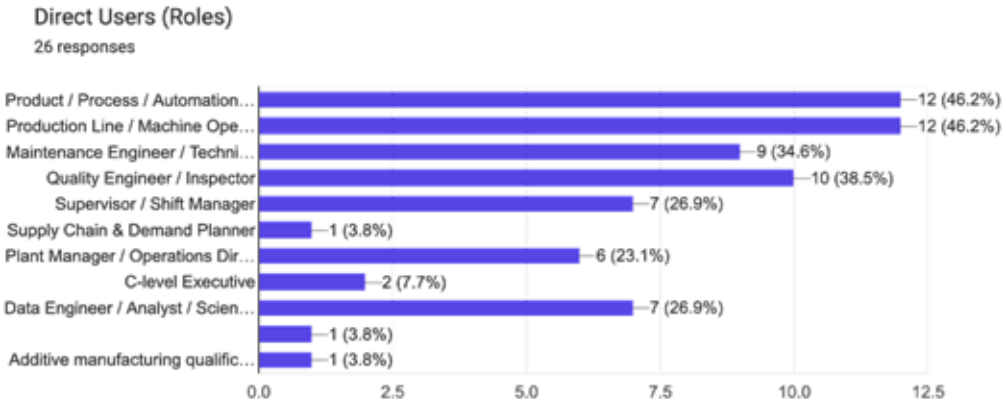

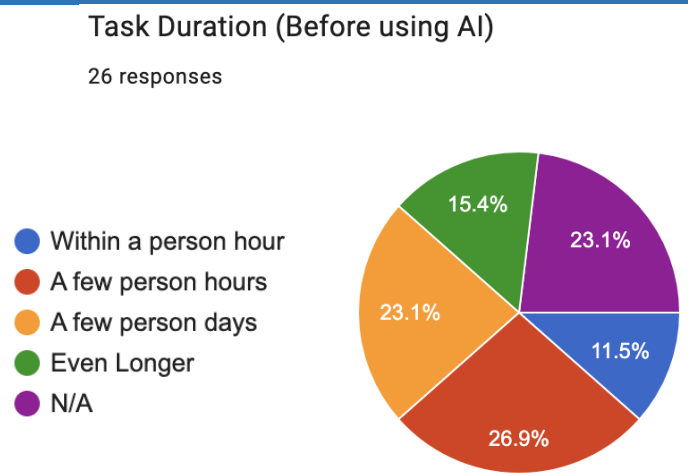

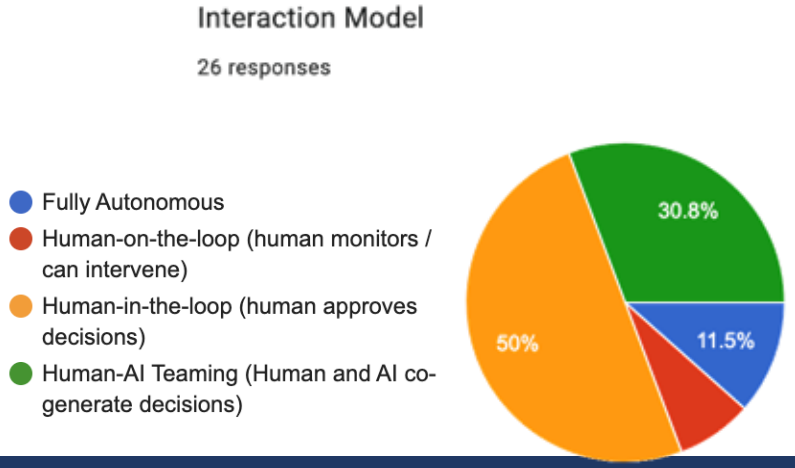

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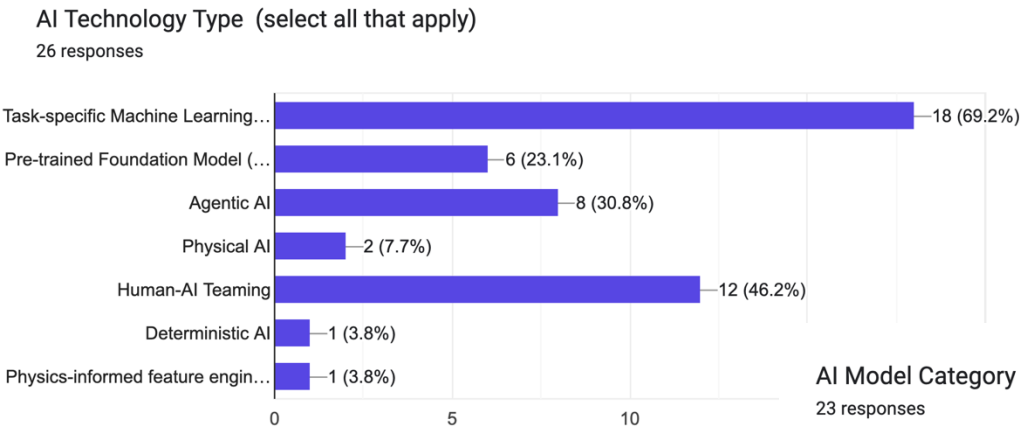

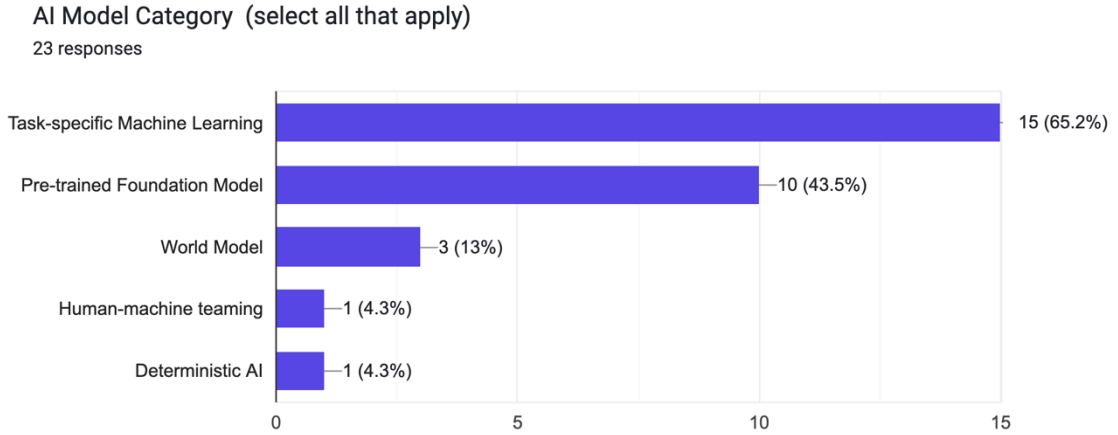

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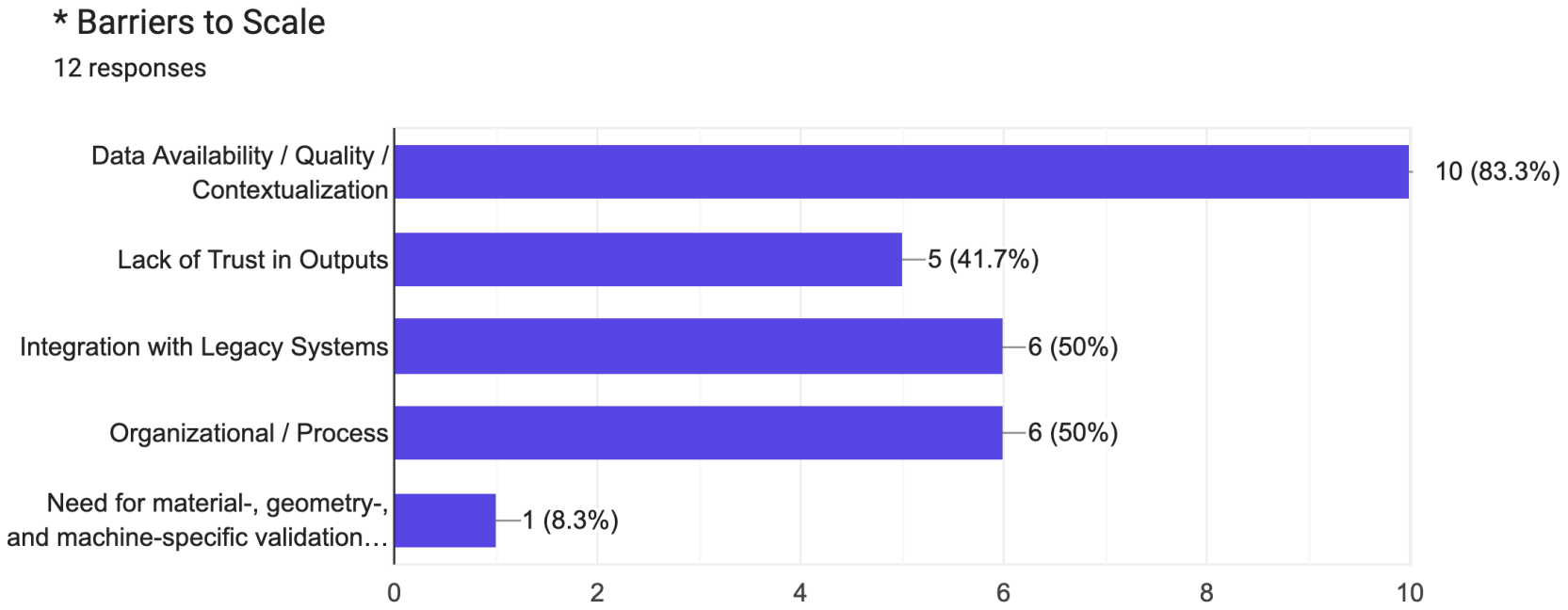
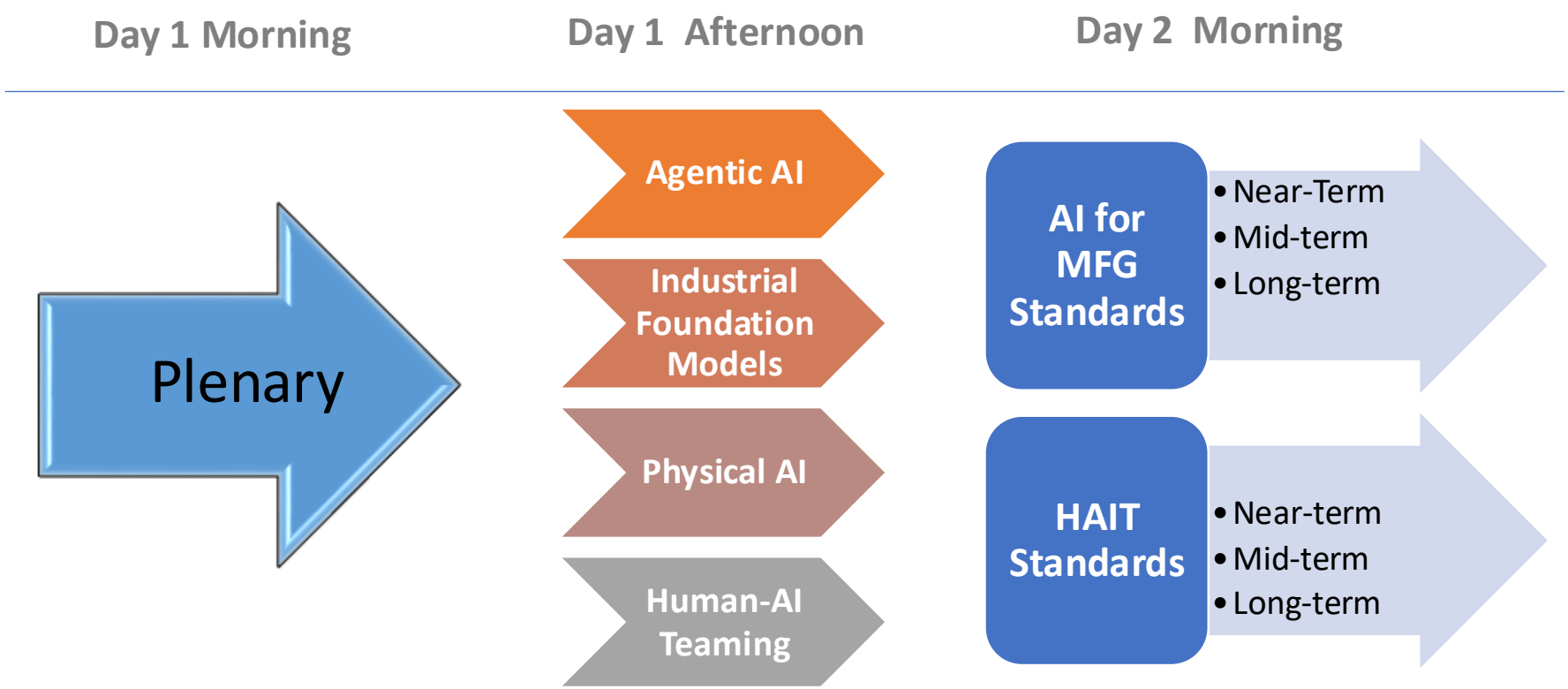


One Plenary, Four Tracks and Two Standards Sessions



Workshop Agenda

Day 1 — May 27, 2026
Heritage Room & Lecture Rooms A & D

7:30 – 8:30	Registration
8:30 – 12:10	Morning Plenary
12:10 – 13:30	Lunch Break
13:30 – 15:10	Breakout Sessions 1 & 2
15:10 – 15:30	Coffee Break
15:30 – 17:10	Breakout Sessions 3 & 4
17:10 – 17:30	Day 1 Wrap-up
18:00	No-host Social Dogfish Head, Gaithersburg

Day 2 — May 28, 2026
Heritage Room

8:10 – 8:15	Day 2 Opening
8:15 – 8:30	NIST ITL AI Program
8:30 – 9:10	Day 1 Breakout Session Reports
9:10 – 10:40	Breakout Session 5 AI for Manufacturing Standards
10:40 – 11:00	Coffee Break
11:00 – 12:15	Breakout Session 6 Human-Machine
12:15 – 12:30	Workshop Wrap-up

Plenary Presentation

Dr. Mohsen Seifi

Vice President, Global Advanced Manufacturing & Critical/Emerging Technologies

ASTM International

Beyond the Model: The Standards That Make AI Work in Manufacturing

Leads ASTM's advanced manufacturing initiatives in Additive Manufacturing, Robotics, and AI. Principal Investigator for ASTM's $15M Standardization Center of Excellence (ASCET CoE). Author of 60+ peer-reviewed publications with 6,500+ citations and 200+ invited lectures worldwide.

Plenary Presentation

Internationally recognized leader in Industrial AI. Leads the Data Foundry (100+ real-world industrial datasets) and the AI Factory initiative. Chairs ASTM F50 AI in Manufacturing Committee. WEF Global Future Council member; Senior Advisor to McKinsey; Fellow of ASME, SME, PHM Society. Author of Industrial AI (Springer, 2020).

Dr. Jay Lee

Clark Distinguished Chair
Professor & Director,
Industrial AI Center

University of Maryland

Trends, Advances, and Challenges of Industrial Physical AI in Smart Manufacturing

Plenary Presentation

Andre Wegner

CEO

Authentise

From Engineering Context to Governed Action: Agentic AI for Reliable Manufacturing Workflows

CEO of Authentise, a leading provider of data-driven workflow management software for additive manufacturing. Chair of Digital Manufacturing at Singularity University, Silicon Valley. His work on AI-assisted engineering collaboration, reverse engineering, compliance checking, and workflow orchestration has been featured in BBC News, MIT Technology Review, and Bloomberg.

Leads NVIDIA's Halos physical AI safety initiative, overseeing safety strategies, architectures, and products for autonomous driving, robotics, and healthcare. Convenor and Project Leader for ISO/IEC TS 22440 (AI Safety) and IEC 61508 for functional safety — a recognized global authority on safe AI deployment.

10:40 – 11:10 AM

Riccardo Mariani

Vice President, Industry Safety

NVIDIA

Functional Safety for Physical AI

AI for Manufacturing: Cross-Sector Perspectives on Progress, Barriers, and Priorities

11:10-12:10pm Moderated by DR. Paul Witherell NIST

Brandon Ribic

Technology Director

America Makes

Jonathan Wise

Chief Technology Architect

CESMII / ACE Technologies

Penny Chen

Principal Technology Strategist

Yokogawa U.S.

Alex Rudin

Autonomy Policy & Strategy Group Lead

MITRE

Break out Sessions, Afternoon, May 27

Afternoon Breakout	Lecture Room A	Lecture Room D
13:30-15:10	Breakout Session 1: **Agentic AI for Manufacturing** **Panelists:** Kentarou YOSHIMURA (Hitachi) Christoph Legat (TUA, Germany) Hyunbo Cho (POSTECH) Clint Nicely (RTX, Vitual) James Zhang (OpsMate AI)	Breakout Session 2: **Industrial Foundation Models: Data and Application Challenges** **Panelists:** Soundar Kumara (Penn State) Amir Kashani (Stanley Black & Decker) Cindy Chang (UVA) Patricia Delafuente (NVIDIA)
15:10-15:30	Coffee Break	
15:30-17:10	Breakout Session 3: **Physical AI in Manufacturing** **Panelists:** Michael Brundage (UMD ARLIS) Nicholas Propes (Seagate) Naichen Shi (Northwestern Uni) Fil Aronshtein (Dirac)	Breakout Session 4: **Human AI Teaming for Manufacturing** **Panelists:** Aoi Minamoto (Toyota) Jamie Goman (ASU) Isabell Shuggi (SAIC USA) Shuchi “SK” Khurana (Addiguru)
17:10-17:30	Wrap up for Day 1 **Heritage Room**	

Breakout Session 1 | Agentic AI for Manufacturing

13:30 – 15:10, May 27, Moderated by Yan Lu Lecture Room A

Kentaro Yoshimura

Principal Researcher

Hitachi, Ltd.

Christoph Legat

Professor

TH Augsburg, Germany

Hyunbo Cho

Professor

POSTECH

Clint Nicely

Principal Mechanical Engineer

Raytheon / RTX

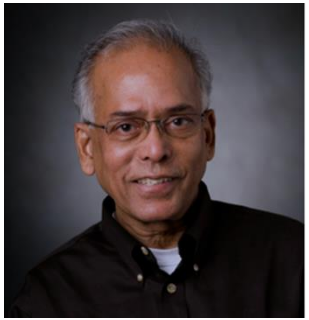
James Zhang

Co-founder & Chief Product Officer

OpsMate AI

Breakout Session 2 | Industrial Foundation Models: Data and Application Challenges

13:30 – 15:10, May 27, Moderated by Dr. Mehdi Dadfarnia, NIST, Lecture Room D



Dr. Soundar Kumara

Allen E. & Allen M. Pearce Professor, Industrial Engineering

Penn State University

Dr. Amir Kashani

Director, AI & Digital Product Development

Stanley Black & Decker

Dr. Qing (Cindy) Chang

Professor, Mechanical & Aerospace Engineering

University of Virginia

Patricia Delafuente

Senior Data Scientist & Solutions Architect

NVIDIA

Breakout Session 3 | Physical AI in Manufacturing

15:30 – 17:10 May 27, Moderated by Dr. Mycha Sharp, Lecture Room A

Dr. Michael Brundage

Mechanical & Industrial Engineer

UMD ARLIS

Nicholas Propes

Senior Staff Data Scientist

Seagate

Dr. Naichen Shi

Assistant Professor, Industrial Eng. & Mechanical Eng.

Northwestern University

Filip Aronshtein

Co-founder & CEO

Dirac

Breakout Session 4 | Human-AI Teaming for Manufacturing

15:30 – 17:10pm, May 27, Moderated by Rachael Sexton Lecture Room D

Aoi Minamoto

AI Systems & Controls Engineer

Toyota / AImoji LLC

Dr. Jamie Gorman

Professor, Human Systems Engineering

Arizona State University

Dr. Isabelle Shuggi

Principal Human Factors Scientist

SAIC

SK Khurana

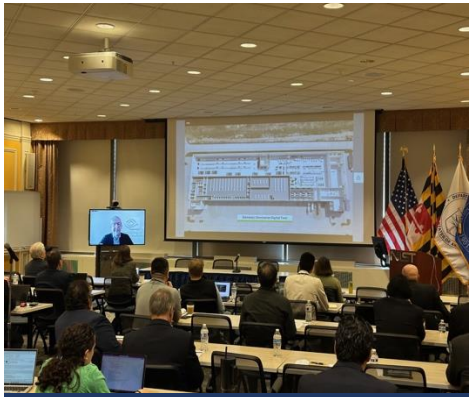
Founder & CEO

Addiguru

Day 1 Highlights

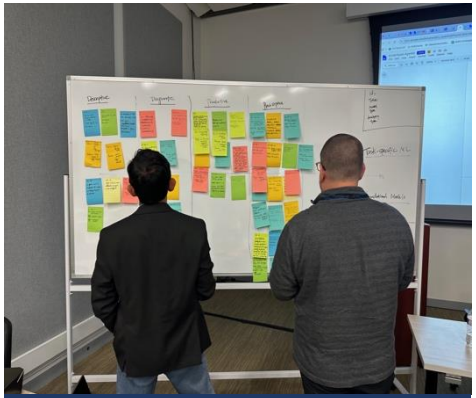
Morning Plenary · Full House

Dr. Jay Lee · Industrial AI



Riccardo Mariani, NVIDIA · Virtual

Plenary Panel Discussion



Agentic AI Breakout Session

Human-AI Teaming Session

Physical AI Breakout Session

No-host Social · Dogfish Head 🍺

Day 2 Sessions - Morning, May 28

May 28	**Heritage Room**	
8:10-8:15	Day 2 Opening	Yan Lu, Workshop Chair
8:15-8:30	The ITL AI Program and its Role in Manufacturing	Craig Schlenoff Chief, Artificial Intelligence Research, Measurement, and Standards Division NIST
8:30-9:10	Day 1 Breakout Session Report	
9:10-10:40	Breakout Session 5: **Standards Needs for AI in Manufacturing** **Panelists:** Arturo Casasa (ISO) Rudy Belliardi (IEC) Anthony Downs (NIST, IEEE) Rick Huff (ASTM) Russell Waddle(MTConnect)	
10:40-11:00	Coffee Break	
11:00-12:15	Breakout Session 6: **Human-Machine Teaming Standards Roadmap** **Panelists:** Arturo Casasa (ISO) Aoi Minamoto (Toyota) Kyoung-Yun Kim (Wayne State Univ.) Hosokawa Nobu (IBM)	
12:15-12:30	Workshop Wrap-up	

Plenary Presentation

Craig Schlenoff

Chief of the AI Research, Measurement, and Standards Division, and the Senior Advisor for AI in the Information Technology Laboratory

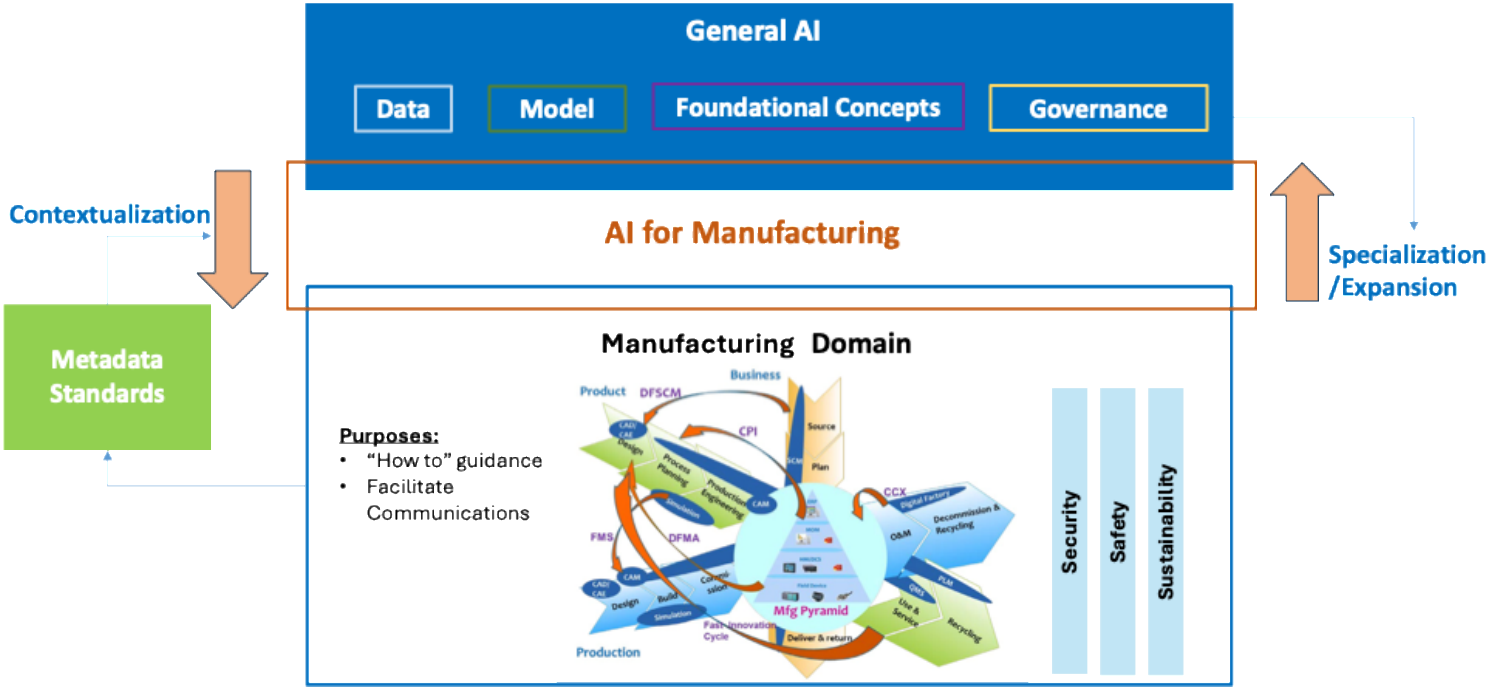
Advises senior leadership on AI trends and helps position the U.S. to lead in AI innovation. Previously served as Director of the NITRD National Coordination Office, coordinating $11 billion in federal IT R&D and co-chairing the AI R&D Interagency Working Group that produced the 2023 AI R&D Strategic Plan Update. His research spans AI, knowledge representation, ontologies, and performance evaluation of autonomous and robotic systems, with over 150 published papers and leadership of multiple large-scale programs in manufacturing robotics and advanced military technologies. He is currently Associate Vice President for Standardization in the IEEE Robotics and Automation Society and teaches at the University of Maryland and Johns Hopkins University.

Session 5: AI for Manufacturing Standards

Objective: This session brings together manufacturing practitioners, automation engineers, AI developers, and standards experts to systematically identify the most pressing standards gaps for AI in manufacturing.

Session Output: a consolidated set of prioritized recommendations, organized by gap, proposed action, and suggested SDO home.

AI for Manufacturing Standards Gaps



Session 5: AI for Manufacturing Standards

Moderated by Dr. Yan Lu, NIST

Rudy Belliardi

Secretary, IEC TC65

IEC

Art Casasa

Principal Advisor, AI Strategy

ISO

Richard Huff

Director, Industry Consortia

ASTM International

Anthony Downs

Project Lead, Group leader

IEEE

Russell Waddell

Community Lead

MTConnect

Front

Table 5: Physical AI(Tony)	**Table 6: Agentic AI (Christoph)**
Table 3: AI Policy and Management & Human Factor (Russ)	**Table 4: Safety & Security (Rudy)**
Table 1: Foundation Models (Penny)	**Table 2:Data (Rick)**

Back

Session 6 | Human-Machine Teaming Standards Roadmap

11:00am-12:15am, May 28, Moderated by Dr. Peter Denno, NIST Heritage Room

Art Casasa

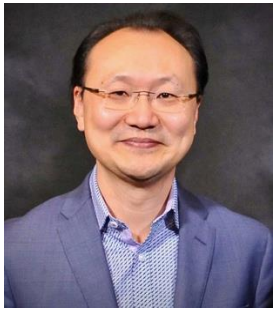
Principal Advisor, AI Strategy & Development

TMAC / Univ. of Houston

Aoi Minamoto

AI Systems & Controls Engineer

Toyota / AImoji LLC



Dr. Kyoung-Yun Kim

Professor, Industrial & Systems Engineering

Wayne State University

Nobuhiro Hosokawa

Technical Master & Quality Eng. Manager

IBM Research-Tokyo