



IEEE SA

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AI FOR MANUFACTURING
WORKSHOP

Standards Landscape, Ongoing Activities & Strategy

Current Landscape

Ongoing Activities

Strategy & Roadmap

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LANDSCAPE

Current Standards Landscape

- **Key standards relevant to AI in Manufacturing**
 - IEEE 2671 - Gen. Req's Online Detection Machine Vision in Intelligent Mfg
 - IEEE 2874 - Spatial Web Protocol
 - IEEE 2660.1 - Rec.Practice Industrial Agents Integration
 - IEEE 3110 - Computer Vision Algorithm APIs
 - IEEE 1872.2 - Autonomous Robotics Ontology
- **Coverage areas**
 - Application Guidance
 - Models
 - Fundamental Concepts
 - Governance
- Gaps vs. emerging AI paradigms (agentic, foundation models, physical AI)

ONGOING

Ongoing Activities

- **Active working groups, committees, & Societies**
 - Smart Manufacturing Standards Committee - interoperability, agility, efficiency
 - Computer Society AI Standards Committee - Core Foundational logic & frameworks
 - Robotics and Automation Society - Robotics, Advanced Manufacturing, Ontologies
- **Standards under development**
 - IEEE P2975.1 Std: Industrial AI Data Attributes - target:2027-2028
 - IEEE P4501 Std: Foundational Framework Mfg Physical AI - target:2029-2030
- **Published in last 2 years**
 - IEEE 2807.1 - Std. Tech. Req's and Eval. Knowledge Graphs
 - IEEE 7003 - Std for algorithm Bias Considerations

NEAR-TERM

1–2 years

New Standards

- P3140 - Std Semantic Maps for Autonomous Robots
- P3145 - Std Gen Tech. Req Warehouse Smart Factory

Migration & Updates

- IEEE 1872 Std Core Ontologies for Robotics and Automation - currently in reballot

MID-TERM

3–5 years

New Standards

- P3144 - Std for Digital Twin Maturity Model ...
- P4122 - Integration Protocol between Industrial Packaging Robot and Vision System

Migration & Updates

- IEEE 2700-2017 - Std for Sensor Performance Parameter Definitions

LONG-TERM

5+ years

New Standards

- Generally trying to move RAS towards Physical AI
- Numerous standards through the Smart Manufacturing.

Migration & Updates

- Deviation Management
- Autonomous Robotics Ontology
- Machine Vision

CROSS-SDO COLLABORATION

Collaboration with IEEE / ISO / IEC / ASTM / MTConnect on AI for Manufacturing: *[Joint Working Group on Humanoid Robots between IEEE RAS & ASTM. Annual Standards Coordination Meeting hosted by IEEE RAS at IEEE ICRA Conference - meeting of IEEE, ISO, IEC, ASTM, A3, ASME, etc. to coordinate standards for Robotics and Automated Systems]*