This document contains supplemental information referenced by the European Commission's 'Rolling Plan for ICT Standardisation'.

IEEE Standards Activities for Advanced Manufacturing

Overview

Advanced Manufacturing is gaining a lot of momentum with technology integration in systems and processes. The integration of more technology-based processes in a manufacturing or production environment helps in driving production automation while also improving the quality of the products and achieving conformance to industrial norms.

IEEE has standards activities relevant to the digitisation of vertical industries, in particular for advanced manufacturing. These standards activities include basic horizontal standards applicable to many industry domains, such as standards for networking and sensors, as well as specific standards addressing the needs of the manufacturing sector, like production process automation in a plant.

IEEE standardization groups are evolving legacy standards and new standardisation projects for smart manufacturing to enable:

• Industrial Services
• Intelligent Factories
• Intelligent Equipment
• Industrial Internet
• Industrial Software and Big Data

The first three represent different integration levels of functionality whereas the following two relate to engineering and implementation techniques.

Relevant Standards Activities

• IEEE TSN (Time Sensitive Networking) provides deterministic connectivity to time and mission critical industrial applications over Ethernet networks (IEEE 802.3). A joint effort with IEC is underway to standardise a profile for industrial automation (IEC/IEEE P60802)
• IEEE 2700-2017, IEEE Standard for Sensor Performance Parameter Definitions, addresses sensor technologies with digital I/O interfaces and specifies a common framework for sensor performance parameters
• IEEE 1451-1-4 and IEEE P1451-99 specify smart transducer Interfaces for sensors and actuators in particular for Industry 4.0
• IEEE P1926.1, IEEE Draft Standard for a Functional Architecture of Distributed Energy Efficient Big Data Processing
• IEEE P2807, Framework of Knowledge Graphs
• IEEE P2807.1, Standard for Technical Requirements and Evaluating Knowledge Graphs
• IEEE P2830, Standard for Technical Framework and Requirements of Shared Machine Learning

- IEEE P2841, Framework and Process for Deep Learning Evaluation
- IEEE P3652.1, Guide for Architectural Framework and Application of Federated Machine Learning
- P3333.1.3 - Standard for the Deep Learning-Based Assessment of Visual Experience Based on Human Factors
- IEEE P2418.1, Standard for the Framework of Blockchain Use in Internet of Things (IoT)
- IEEE P2418.2, Standard Data Format for Blockchain Systems
- IEEE 2413-2019, IEEE Standard for an Architectural Framework for the Internet of Things (IoT)

Approved Standards and New or Revision Projects*
- IEC/IEEE 62659-2015, International Standard for Large Scale Manufacturing for Nanoelectronics
- IEEE P1589, IEEE Draft Standard for an Augmented Reality Learning Experience Model
- IEEE P1857.9, IEEE Draft Standard for Immersive Visual Content Coding
- IEEE P2413.1, IEEE Draft Standard for a Reference Architecture for Smart City (RASC)
- IEEE P2668, IEEE Draft Standard for Maturity Index of Internet-of-Things: Robotics
- IEEE 1872-2015, IEEE Standard Ontologies for Robotics and Automation
- IEEE P1872.1, IEEE Draft Standard for Robot Task Representation
- IEEE P1872.2, IEEE Draft Standard for Autonomous Robotics (AuR) Ontology
- IEEE 1873-2015, IEEE Standard for Robot Map Data Representation for Navigation
- IEEE P2751, IEEE Draft Standard for 3D Map Data Representation for Robotics and Automation

Intelligent Process Automation and Manufacturing
- IEEE 2755-2017, IEEE Guide for Terms and Concepts in Intelligent Process Automation, specifies concepts, capabilities, terms, and technology needed for new SW based intelligent automation capabilities
- IEEE P2755.1, IEEE Draft Standard for the Taxonomy and Classification for Software Based Intelligent Process Automation (SBIPA) Technology
- IEEE P2671, IEEE Draft Standard for General Requirements of Online Detection Based on Machine Vision in Intelligent Manufacturing
- IEEE P2672, IEEE Draft Guide for General Requirements of Mass Customization

Testing

- IEEE 1232-2010 (Revision of IEEE 1232-2002), IEEE Standard for Artificial Intelligence Exchange and Service Tie to All Test Environments (AI-ESTATE)

IEEE Industry Connections program
- IC17-003, India Robotics Roadmap
- IC17-007, Neuro Tech for Brain-Machine Interfacing
- IC17-017, Blockchain Asset Management

More information is available at https://standards.ieee.org/

*NOTE: Draft standards projects, once approved, are often revised and/or used as the base for new projects. The status of these projects is updated periodically. For the most up-to-date status, please see the following link: <https://standards.ieee.org/project/index.html>

standards.ieee.org

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