IEEE Standards Activities in Digitization of European Industry/Advanced Manufacturing

Overview

Advanced Manufacturing is gaining a lot of momentum with technology integration in systems and processes. The integration of a technology-based process in a manufacturing or production environment helps in driving production automation while also improving the quality of the products and achieving conformance to industry specifications. IEEE has standards activities relevant to digitization of industry/advanced manufacturing, including basic horizontal standards applicable to many industry domains e.g. for 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 groups evolving legacy standards and new standardisation projects for smart manufacturing into:

- Industrial Services
- Intelligent Factories
- Intelligent Equipment and distinguishes
- Industrial Internet
- Industrial Software and Big Data

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

Some key enabling standards for smart manufacturing include the following:

- 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 1451-1-4 and IEEE P1451-99 specify smart transducer Interfaces for sensors and actuators in particular for Industry 4.0

Relevant Standards Activities

IEEE Standards Series*
- IEEE 802 series on networking
- IEEE 1451 series on sensors

Approved Standards and New or Revision Projects*
- 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, IEEE Draft Standard for an Architectural Framework for the Internet of Things (IoT)
- IEEE P2413.1, IEEE Draft Standard for a Reference Architecture for Smart City (RASC)

Robotics
- IEEE P1872.1, IEEE Draft Standard for Robot Task Representation
- IEEE P2730, IEEE Draft Standard for Classification, Terminologies, and Definitions of Medical Robots
- IEEE P2751, IEEE Draft Standard for 3D Map Data Representation for Robotics and Automation

Intelligent Process Automation and Manufacturing

Testing

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

Big Data associated with Intelligent Systems

- IEEE P1752, IEEE Draft Standard for Mobile Health Data
- IEEE P2673, IEEE Draft Standard for Patient Digital Biomedical Data Files with 3D Topological Mapping of Macroanatomy and Microanatomy for Use in Big Data and Augmented Intelligence Systems
- IEEE P2791, IEEE Draft Standard for Bioinformatics Computations and Analyses Generated by High-Throughput Sequencing (HTS) to Facilitate Communication
- IEEE P3333.2.3, IEEE Draft Standard for Three-Dimensional (3D) Medical Data Management

Other related work

IEEE Industry Connections program

- IC17-003, India Robotics Roadmap
- IC17-007, Neuro Tech for Brain-Machine Interfacing

The following link provides additional information about the Internet of Things and the corresponding IEEE standards and projects:

https://ieeesa.io/rp-iot

The following link provides additional information about Big Data, Data Privacy and Open Data, and the corresponding IEEE standards and projects:

https://ieeesa.io/rp-open-big-data

*Draft standards projects, once approved, are often revised and/or used as the base for new projects, and therefore may appear in both the "active standards" and "projects under development" lists.