

ASTM INTERNATIONAL CONFERENCE ON ADVANCED MANUFACTURING

Research to Application through Standardization

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Industry 4.0: Data Management

Additive manufacturing (AM) is uniquely characterized by large amounts of data generated from various steps of the AM process. These steps include design, process planning, building, in-situ monitoring, post-processing, inspection, characterization, and testing, as well as the operating performance of an AM component during its service life. While such data can be used to understand key process variables (KPVs) and support decision-making, the management of the distributed, big data has become a challenge. Methods of AM data annotation, acquisition, transformation, registration, storage, analysis, security, traceability, interpretation, and sharing have yet to be fully explored. Although many companies have developed internal procedures to address the above challenges, the AM community would benefit from standards and best practices that are widely accepted and available to the public, particularly small and medium-sized enterprises (SMEs).

Topics of interest include but are not limited to:

- Landscape analysis: AM data management experiences and lessons
- Case studies, challenges, and best practices for:
 - AM Data modeling – data dictionary, semantic models, and data exchange formats
 - Standard data generation
 - Automated data and metadata acquisition and curation
 - Data management and governance in AM
 - Data publishing and sharing in AM
 - AM data Integration and federation
 - AM data registration
- AM data management requirements, especially those supporting correlation between on-machine and off-machine AM data
- Application of IoT and big data technology in AM Data Management
- AM material database
- Application of simulation in the development of AM material databases
- Data and software integration for findability, accessibility, interoperability, and reusability
- Streamlining AM workflow with data management
- AM-Enterprise data integration for AM industrialization
- AM data quality management and AM digital twin applications
- Visualization of large-scale AM data
- Standardization gaps for AM data management
- AM knowledge management
- Low-cost acquisition of high-quality data for process parameter development
- Evaluation and completing data gaps using AI



Symposium Organizers

- Peter Coutts, Pennsylvania State University, USA
- James Fonda, Boeing, USA
- Yan Lu, National Institute of Standards and Technology (NIST), USA
- Mike Vasquez, 3Degrees Consulting, USA



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Research to Standards

ADDITIVE MANUFACTURING