



# ICAM25

## International Conference on Advanced Manufacturing Research to Application through Standardization

October 6-10 | Las Vegas, NV

### Industry 4.0: Artificial Intelligence, Machine Learning and Big Data Analytics



The rapid advancement and increased adoption of additive manufacturing (AM) technologies have coincided with AI and machine learning (ML) methods. AM generates large amounts of data throughout the product lifecycle, including design, process planning, monitoring, post-processing, inspection, testing, and in-service health monitoring. Managing this distributed big data is challenging, requiring standards for data annotation, acquisition, transformation, storage, analysis, security, traceability, interpretation, and sharing. Such standards would benefit the AM community, especially SMEs. Leveraging AI and ML can accelerate materials development, optimize process parameters, and improve AM process understanding and product quality, but this requires structured, manageable data for advanced analytics.

#### TOPICS OF INTEREST INCLUDE BUT ARE NOT LIMITED TO:

- **AI & ML Applications in AM:** Optimizing part design and process planning, material and parameter development, in-situ process monitoring and control, material-structure-property relationships, predictive maintenance, and non-destructive part evaluation.
- **Data Management:** Automated data acquisition, metadata curation, data governance, publishing, sharing, integration, and standardization gaps in AM data management.
- **Technology Applications:** Utilizing IoT and big data technologies in AM, developing material databases, visualizing large-scale AM data, and implementing digital twin applications. How can new and emerging tools enable us to analyze data in novel ways?
- **Infrastructure:** Designing infrastructure and software for AI & ML in AM, standardizing data, and ensuring adherence to FAIR principles (findability, accessibility, interoperability, and reusability).

#### Symposium Organizers

- **Peter Coutts**, Pennsylvania State University, USA
- **Omar Fergani**, 1000kelvin, USA
- **Paul Guerrier**, Moog Inc., USA
- **Sanam Gorgannejad**, Lawrence Livermore National Laboratory, USA
- **Jia (Peter) Liu**, Auburn University, USA
- **Yan Lu**, National Institute of Standards and Technology (NIST), USA
- **Simon McCaldin**, Authentise, United Kingdom
- **Zackary Snow**, Oak Ridge National Labs (ORNL), USA

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an abstract

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