

## ASTM INTERNATIONAL CONFERENCE ON ADDITIVE MANUFACTURING Research To Application Through Standardization

October 31 – November 4, 2022 | Orlando, FL  
JW Marriott Orlando Bonnet Creek Resort & Spa

Submit an Abstract at [www.amcoe.org/icam2022](http://www.amcoe.org/icam2022)

### Industry 4.0: Artificial Intelligence and Machine Learning in AM

The rapid advancement and increased adoption of additive manufacturing (AM) technologies in the industry have coincided with the mainstream emergence of artificial intelligence (AI) and machine learning (ML). The various steps of the AM process generate massive amounts of design, process planning, building, in-situ monitoring, post-processing, inspection, characterization, and testing data. Additionally, the operation performance of a component during its service life also generates valuable data, if recorded. Besides data, a large number of parameters are defined that monitor and control the AM processes. Hence, both data and parameters make AM a great candidate for AI and ML applications if the data can be structured and registered and the parameters made clear, consistent and comparable. The objective of applying AI & ML is to better expose the physical phenomena underlying AM and to fine-tune the AM processes.

#### **This symposium aims to cover the following topics:**

- Landscape survey and analysis:  
AI & ML in AM

#### **Applications of AI & ML in:**

- Design optimization
- Process optimization
- In-situ monitoring signal to defect correlation
- Material-process-microstructure-property relationships
- Predictive maintenance
- Process qualification

- AM data requirements for enabling AI & ML (e.g. data registration and featurization)
- Infrastructure design and software development for AI & ML in AM
- Data and software integration for findability, accessibility, interoperability, and reusability
- Big data analytics in AM; definition and case studies
- Standardization needs for AI & ML in AM
- Platform design for data sharing and collaboration in AI & ML in AM



### Symposium Organizers

- Kareem Aggour, GE, USA
- Shaw Feng, NIST, USA
- Brian Giera, Lawrence Livermore National Laboratory, USA
- Branden Kappes, Gontextualize, USA
- Jia Liu, Auburn University, USA
- Aaron Stebner, Georgia Tech, USA



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