

**Institute of Industrial and Systems Engineers
Quality Control & Reliability Engineering (QCRE) Division
2021-2022 Webinar Series**

IISE Quality Control & Reliability Engineering (QCRE) division would like to invite you to attend our webinar on Wednesday, October 13, 3-4 p.m., Eastern Time.

Zoom Link: <https://ncsu.zoom.us/j/96908345006?pwd=eTZnRlEwcnRJWWtwSDNxc1JYbUVsZz09>

Meeting ID: 969 0834 5006

Time: October 13, Wednesday, 3-4 p.m., Eastern Time.

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Title: Sensor-based Modeling and Optimization of Additive Manufacturing

Presenter: Dr. Hui Yang, Professor of Industrial and Manufacturing Engineering, Bioengineering, The Penn State University

Abstract: Additive manufacturing (AM) provides a greater level of flexibility to produce a 3D part with complex geometries directly from the design. However, the widespread application of AM is currently hampered by technical challenges in process repeatability and quality control. To enhance the in-process information visibility, advanced sensing is increasingly invested for real-time AM process monitoring. The proliferation of in-situ sensing data calls for the development of analytical methods for the extraction of features sensitive to layerwise defects, and the exploitation of pertinent knowledge about defects for in-process quality control of AM builds. As a result, there are increasing interests and rapid development of sensor-based models for the characterization and estimation of layerwise defects in the past few years. However, there is a dearth of concentrated implementation of Six-Sigma quality management approaches for quality control of AM builds. In this talk, we present new data-driven analytical methods, including deep learning, machine learning, and network science, to characterize and model the interrelationships between engineering design, machine setting, process variability and final build quality. Further, this talk will demonstrate the methodologies of ontology analytics, design of experiments (DOE) and simulation analysis for AM system improvements. In closing, new process control approaches will be discussed to optimize the action plans, once an anomaly is detected, with specific consideration of lead time and energy consumption.

Biography: Dr. Hui Yang is a Professor of Industrial and Manufacturing Engineering, Bioengineering at Penn State, and is affiliated with Penn State Cancer Institute (PSCI), Clinical and Translational Science Institute (CTSI), Institute for Computational and Data Sciences (ICDS), CIMP-3D. Currently, he serves as the PI and site director of NSF Center for Health Organization Transformation (CHOT). Dr. Yang was the president (2017-2018) of IISE Data Analytics and Information Systems Society, the president (2015-2016) of INFORMS Quality, Statistics and Reliability (QSR) society, and the program chair of 2016 IISE Annual Conference. He is also a department editor for IISE Transactions Healthcare Systems Engineering, an associate editor for IISE Transactions, IEEE Journal of Biomedical and Health Informatics (JBHI), IEEE Transactions on Automation Science and Engineering (TASE), IEEE Robotics and Automation Letters (RA-L), Quality Technology & Quantitative Management, and an Associate Editor for Proceedings of IEEE CASE, IEEE EMBC, and IEEE BHI.

