ASME® 2020 HACKATHON

Hilton - St. Louis
1 S BROADWAY
ST. LOUIS, MO 63102

ASME - CIE Hackathon
AUGUST 15TH - 16TH 2020

Identifying, Extracting, Analyzing

Value from Large Unstructured Data Sets in Mechanical Engineering

Virtual Hackathon
APPLY NOW!
Registration Deadline: August 11, 2020

Sponsored by:
ASME Computers & Information in Engineering Division (CIE) & ASME Technical Events and Content (TEC) Sector Council
ASME Manufacturing Engineering Division (MED) Centennial Celebration Endorsed Event

Prizes: 1st Place: $2000 | 2nd Place: $1000 | 3rd Place: $500

2020 ASME-CIE Hackathon – Call For Participants

Hackathon Topics

Identifying, Extracting, Analyzing Value from Large Unstructured Data Sets in Mechanical Engineering

Check-in starts at 2pm on Saturday, August 15 ❖ Virtual Meeting

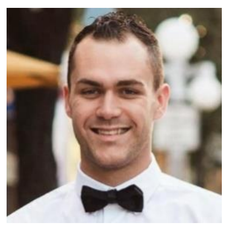
Description: It is reported that majority of the data collected (more than 80%) is unstructured data in the form of image, video, audio, undefined text and numbers. This is true in many mechanical engineering subfields where sensors are ubiquitous and digitization is pervasive. While the value of unstructured data is evident by the vigor and velocity with which new tools are being created in the private sector to extract this hidden value, in mechanical engineering, the question of how to leverage the power of unstructured data to benefit product design and development, manufacturing and complex systems engineering is still yet fully answer.

The motivation of this Hackathon initiative is to support a platform for researchers to practice data-driven discovery and explore new statistical and machine-learning techniques appropriate for the use of unstructured data that would be beneficial to mechanical engineering, and developing pathways to train the data-skilled mechanical engineers that can harness the data revolution in different engineering fields. The participants will have the opportunity to learn and experience various data visualization, data mining, and machine learning methods.

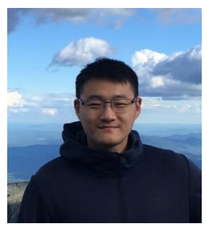
ASME-CIE Hackathon Organizer – ASME SEIKM Technical Committee

Zhenghui Sha
Assistant Professor
University of Arkansas

Yan Lu
Senior Research Scientist, NIST



Bryan O'Halloran
Assistant Professor
Naval Postgraduate School



Zhuo Yang
Guest Researcher, NIST

Hackathon Challenges

Problem 1: Machine Damage Accumulation Prediction using Heterogeneous Temporal Sensor Data: The objective is to extrapolate the values measured by the machine sensors up to one hour in the future to provide enhanced predictive maintenance capabilities and machine usage forecasting. The data will be collected from the Bernard M. Gordon Learning Factory at Penn State. The center is a hands-on facility for engineering students to use in conjunction with capstone design, as well as research projects and student organizations.

Problem 2: In-Process Data Mining for Powder-Bed Fusion Additive Manufacturing: For manufacturers to build quality AM parts, in-situ data has the potential to be used for quality assurance and certification, which will dramatically reduce the need of lengthy and high-cost post inspections. The goal of this hackathon subtopic is to promote the use of data science in powder-bed fusion additive manufacturing to accelerate the understanding of powder-bed fusion AM process, to improve PBF process monitoring and control as well as to explore in-process data-based product qualification.

Mentors:

Christopher McComb, Assistant Professor, School of Engineering Design, Technology and Professional Programs, Penn State University

Faez Ahmed, Assistant Professor, Department of Mechanical Engineering, MIT

Dehao Liu, Graduate Research Assistant, School of Mechanical Engineering, George Institute of Technology

Anh Tran, Postdoctoral Appointee, Sandia National Laboratories

CIE SEIKM Technical Committee