ANNUAL MEETING
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TMS2021
SINCE 1871
AND EXHIBITION

SUBMIT AN ABSTRACT BY JULY 1

MARCH 14-18, 2021 • ORLANDO WORLD CENTER MARRIOTT
ORLANDO, FLORIDA, USA
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SUBMIT AN ABSTRACT TO:

MATERIALS DESIGN

AI/DATA INFORMATICS: DESIGN OF STRUCTURAL MATERIALS

There is growing recognition that informatics is a promising path forward to accelerating the design of structural materials. In particular, the incorporation of statistical models for uncertainty quantification into phenomenological models for both design and prediction of processing- microstructure-mechanical performance relationships has implications for both fundamental research and industrial development applications alike. Further, the application of mathematical optimization techniques for the design of the material composition, microstructure, and structural topology add further dimensionality to informatics in materials science. To fully realize the potential of materials informatics for structural materials engineering, we need to address an array of challenges associated with the fact that the collection of performance metrics requires destructive testing and quantitative evaluation across many time and length-scales.

We invite presentation abstracts on the topics of developing and utilizing informatics tools for discovering, understanding, and predicting processing-microstructure- mechanical performance relationships. A conversation on the needs and limitations of high-throughput synthesis, characterization, and testing, as well as the effect of biased data sets are also valuable contributions to the symposium. Additionally, optimization approaches to design materials with tailored properties would provide valuable discussion of the interdisciplinary toolsets needed to realize new structural material designs. Topics on fatigue and high-temperature structural materials might be better suited in related symposia (i) such as Fatigue in Materials: Fundamentals, Multiscale Characterizations and Computational Modeling, or (ii) Materials Informatics Frameworks for Accelerated Materials Design of High Temperature Alloys, respectively.

Potential topics as related to understanding and designing mechanical properties of materials:

- Text mining
- Statistical modeling
- Data-driven property discovery
- Data dimensionality reduction in materials science
- Multidimensional data visualization for exploratory analysis
- High-throughput experimental design Intentional gradients in microstructures for combinatorial experiments
- Multivariable optimization approaches

ORGANIZERS

Jennifer Carter, Case Western Reserve University, USA
Amit Verma, Carnegie Mellon University, USA
Natasha Vermaak, Lehigh University, USA
Jonathan Zimmerman, Sandia National Laboratories, USA

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Abstract Deadline is July 1, 2020. Submit online at www.programmaster.org/TMS2021.

Questions?
Contact programming@tms.org