

— Call for Papers —

A Symposium on

Manufacturing Process Characterizations for System Level Sustainability Assessment

Sponsored by the ASME Manufacturing Engineering Division's
Life Cycle Engineering Technical Committee

2017 ASME International Manufacturing Science and Engineering Conference (MSEC)*

June 4-8, 2017,

University of Southern California

Technical Focus

Sustainability assessment is fundamentally a complex problem requiring one to balance trade-offs that can span an entire life cycle of the artifact being assessed. Current methods to assess and describe sustainability of manufactured products do not necessarily account for manufacturing processes explicitly, and hence result in inaccurate and ambiguous comparisons. Manufacturing processes are large contributors to energy and material consumption and waste production--key components of sustainability assessment. Comparisons which lack detailed and specific data on the manufacturing processes do not productively contribute to sustainability improvement. Accurate measurement and representation of the use of manufacturing resources is needed for meaningful sustainability improvement.

In this symposium, we will look at methods for formulating manufacturing process characterizations for system level sustainability assessment. Formal methods for acquiring and exchanging information will lead to consistent characterizations and help establish a consolidated database of sustainability measurements. Consistency of the characterizations will ensure effective communication of computational analytics and sharing of sustainability performance data. This session welcomes models of unit manufacturing processes with emphasis on methods used for modeling those processes to be reusable. We seek to bring together technical developments in measurement science and methodologies to evaluate sustainability of fundamental manufacturing processes to ensure reliable and consistent comparisons. We strongly encourage papers to focus on environmental impacts while discussing manufacturing performance. Specific topics of interest include, but are not limited to:

- Information models for describing different types of unit manufacturing processes
- Methods for validating the correctness and accuracy of models of unit manufacturing processes
- Information models capturing manufacturing process performance and information flows that facilitate data collection, sharing, and communication with other manufacturing applications such as modeling, simulation, and analysis tools.
- Measurement-based methodologies to evaluate and report sustainability performance for unit manufacturing processes.
- Manufacturing process classifications and taxonomies
- Sustainable manufacturing indicators and computable metrics
- Methods for linking manufacturing process data and life cycle inventory data
- Tool development to support modeling and composition of manufacturing for sustainability assessment
- Tools to accelerate the construction of a repository of characterized manufacturing process models through intuitive interfaces and reuse of supporting information and knowledge (e.g., search, retrieval, and schema).
- Tool development for decision support capabilities through reuse of characterized manufacturing process models

Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **November 03, 2016** via the conference website. Final revised manuscripts must be submitted by **March 08, 2017**. The copyright transfer form must be filled out and the presenting author must pre-register by April 06, 2017 or the paper will be withdrawn from the conference. Authors may also consult www.asme.org/divisions/med/call/ for updates. **No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at www.asmeconferences.org/msec2017/.**

Additional Symposium Activities

To emphasize the model validation, symposium organizers intend to propose a challenge problem on modeling of unit manufacturing processes for academic participation. The results of this challenge will be a collection of student projects modeling specific manufacturing processes. Methods for validating those models will be of specific interest and we invite papers to explore different approaches to validation in light of a variety of similar yet different models. This activity will be organized alongside the main symposium.

Organizers

Mahesh Mani, Dakota Consulting Inc., 301-975-5219, mahesh.mani@nist.gov
K.C. Morris, National Institute of Standards and Technology, 301- 975-8286, katherine.morris@nist.gov
Kevin W. Lyons, National Institute of Standards and Technology, 301-975-6550, kevin.lyons@nist.gov
Karl R. Haapala, Oregon State University, 541-737-3122, Karl.Haapala@oregonstate.edu
Barbara S. Linke, University of California Davis, 530- 752-6451, bslinke@ucdavis.edu

*The conference is collocated with NAMRI/SME's 45th North American Manufacturing Research Conference (NAMRC45) and JSME's International Conference on Materials and Processing (ICMP 2017), both of which have a separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.