

# — Call for Papers —

## A Symposium on

### Computational Methods and Process Planning for Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
*Additive Manufacturing Technical Committee*  
2020 ASME International Manufacturing Science and Engineering Conference (MSEC)\*  
June 22 – 26, 2020  
Cincinnati, Ohio  
Hosted by the University of Cincinnati, College of Engineering and Applied Science

#### Technical Focus

Recent advances in additive manufacturing (AM) enable the fabrication of complex and customized parts that are difficult to produce by traditional manufacturing technologies. The new manufacturing capabilities have driven the evolution of computational tools to support design, planning, and analysis of functional parts and assemblies. Meanwhile, the computational methods must take the new constraints of different AM technologies into account. To utilize the capabilities of AM, computer algorithms are being developed to generate desired designs under given design objectives and constraints, as well as to support the emerging AM processes. Example approaches range from shape and topology optimization to semantic design, and to machine learning based designs, among others. Process planning like slicing, support generation and toolpath planning also affects the shape, material distribution, and physical behavior of the fabricated design. The computational methods and AM processes are increasingly being combined to produce disruptive high-performance functional structures with applications in aerospace, automotive, medical, soft robots, customized consumer products, and beyond. This vibrant research area is receiving growing attention in multiple disciplines, such as geometric modelling, graphics, numerical optimization, and computational mechanics. These challenging research topics must be addressed to synthesize parts, assemblies, and systems so that design tools can take full advantage of the rapid advancement in emergent manufacturing technologies. The goal of this symposium is to bring together researchers from relevant fields into a common forum, to share cutting-edge research on computation methods for AM. The joint efforts will accelerate the transition from the stage of conceptual design to final design, and the movement of additive manufacturing from prototyping to industrial production. Specific topics of interest include, but are not limited to:

- Modeling, analysis, and optimization for AM.
- Process planning and simulation for AM.
- Generative design and topology optimization for AM.
- Machine learning and data-driven methods for AM.
- Design for AM with different scales and material compositions.
- Simulating function and performance for parts fabricated by AM.
- Spatial planning and manufacturability analysis for AM.
- Modeling uncertainty in AM processes.

#### Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **November 15, 2019** via the conference website. Final revised manuscripts must be submitted by **March 26, 2020**. The [copyright transfer form](#) must be filled out by March 19, 2020 and the presenting author must [pre-register](#) by **April 15, 2020** or the paper will be withdrawn from the conference. **No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at <https://event.asme.org/MSEC/>.**

All papers accepted by MSEC2020 can be further submitted to any ASME journals, such as the highly prestigious Journal of Manufacturing Science and Engineering, for consideration of archival publication. In addition, high quality MSEC2020 papers will be automatically channeled to relevant ASME journals for fast-tracked publications.

#### Additional Symposium Activities

In order to communicate the knowledge generated through this symposium to a wide audience, the organizers will:

- Work to attract a high profile international keynote speaker
- Organize a state-of-the-art paper that will be the lead article in the special issue

#### Organizers:

Dr. Tsz-Ho Kwok, Concordia University, Montreal, QC, Canada. 514-848-2424 #3807; [tszho.kwok@concordia.ca](mailto:tszho.kwok@concordia.ca)  
Dr. Yunbo "Will" Zhang, Rochester Institute of Technology, Rochester, NY, USA. 585-475-5571; [ywzeie@rit.edu](mailto:ywzeie@rit.edu)  
Dr. Chi Zhou, University at Buffalo, SUNY, Buffalo, NY, USA. 716-645-4706; [chizhou@buffalo.edu](mailto:chizhou@buffalo.edu)

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\* The conference is collocated with NAMRI/SME's 48th North American Manufacturing Research Conference (NAMRC48) and LEM&P (Leading Edge Manufacturing / Materials and Processing) by The Japan Society of Mechanical Engineers (JSME), which will have a separate call-for-papers. Please note that submissions of the same paper to more than one conferences are not permitted.