



Department of
Mechanical Engineering
The University of Hong Kong



From Precision Manufacturing to Intelligent Metrology

(onsite and online)

Seminar jointly organized by the Department of Mechanical Engineering
and the Department of IMSE

Date: 4 April, 2023 (Tuesday)
Time: 11:00 a.m. (Hong Kong Time)
Venue: Tam Wing Fan Innovation Wing Two, HKU

Speaker: Dr. Ping Guo
Department of Mechanical Engineering
Northwestern University



Zoom Online Lecture:

<https://tinyurl.com/3jzfhnu6>

Meeting ID: 912 6999 9611
Password: 246145

Abstract:

My research vision is to bring innovations to precision engineering by pushing the limit of precision manufacturing and expanding the boundary of intelligent metrology. In this talk, I will present two examples that illustrate our efforts in innovating precision manufacturing and measurement capabilities. The first example applies conventionally undesirable vibration in precision cutting to bring unprecedented process capabilities. The invented vibration-assisted precision texturing process is able to fast pattern controllable wavelength-scale gratings for structural coloration and advanced optics. In the second example, I will introduce our recent efforts to use deep learning to achieve end-to-end prediction to enhance photometric stereo for potential in-process three-dimensional form measurement. I will demonstrate a combined physics-based and data-driven approach to synthesize realistic and large-scale datasets for the optimal performance of deep learning techniques in manufacturing applications. Finally, I will briefly share some other ongoing research projects that hopefully bring inspiration to future precision engineering.

Biography:

Dr. Ping Guo is an Assistant Professor at the Department of Mechanical Engineering, Northwestern University. He received his B.S. degree in Automotive Engineering from Tsinghua University in 2009 and his Ph.D. degree in Mechanical Engineering from Northwestern University in 2014. Before joining Northwestern University in September 2018, he spent four years at the Chinese University of Hong Kong as an Assistant Professor. Dr. Guo's research interests center on the paradigm of micro/meso-scale manufacturing, including precision surface texturing, process micro-mechanics, miniature machine tools, metrology, micro-additive manufacturing, etc. He currently serves as the Associate Editor of the Journal of Manufacturing Processes. He is the recipient of T.W. Taylor Medal from CIRP 2023, Kornel F. Ehmann Manufacturing Medal from ASME 2021, Outstanding Young Manufacturing Engineer Award from SME 2020, Young Investigator Award from International Symposium on Flexible Automation 2018, Hong Kong Research Grants Council Early Career Award 2016. He is elected as the Associate Member of the International Academy for Production Engineering (CIRP) in 2022.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. Nicholas Fang at 3917 2639.