Diagnosis of Multi-scale Spatial Point Interaction Based on Decomposition of the K Function-based T2 Statistic

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Abstract

Data in the form of spatial point distribution are commonly encountered in manufacturing processes such as nanoparticles in composite materials. By analyzing their distributional characteristics which are often related to product quality, we can monitor and diagnose the fabrication processes. Based on recent advancement on modeling the K function of point patterns using Gaussian process, we proposes to diagnose point patterns through decomposition of a K function-based T2 statistic. The decomposition provides a novel way for independently analyzing point interactions at multiple spatial scales, which is particularly useful for fault diagnosis when the process is out-of-control. Effectiveness of the proposed method has been verified through several simulated examples and real data.

About the Speaker

Xiaohu Huang received his B.S. degree from Huazhong University of Science and Technology, Wuhan, China, in 2013. He is currently working towards the Ph.D. degree in Department of Systems Engineering and Engineering Management at City University of Hong Kong, Hong Kong, supervised by Dr.
Qiang Zhou. His research interests focus on spatial point analysis, statistical modelling and datamining.

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*All are Welcome!*

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