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SEMINAR

DEPARTMENT OF STATISTICS

THE CHINESE UNIVERSITY OF HONG KONG

Nature-Inspired Metaheuristic Optimization for Scientific Investigations and Industrial Applications

INVITED SPEAKER

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TIME

February 11th, 2025 (Tue) · 10:30 am - 11:30 am

VENUE

SWH 2(G/F) · Fung King Hey Building 2 · CUHK

ABSTRACT

Nature-inspired metaheuristic optimization has been a popular method for optimization problems in engineering in the past decades, but their applications in scientific researches and other industrial applications are few, mostly due to the noncontinuous property as their solution space. Swarm Intelligence Based (SIB) method was proposed to provide an alternative to the problems that have discrete domain in nature, which is quite common in mathematical and statistical optimizations. In this talk, the standard framework of the SIB 1.0, which includes the MIX and MOVE operations, are introduced, and some examples in the optimization of experimental designs, network analysis, and computer science are discussed. Next, based on an important limitation of the SIB 1.0, we develop an enhanced version of the SIB with particle size varying over the optimization process. Additional examples in the statistical optimization are provided. At the end, we introduce two important applications of the SIB method on logistic and marketing industries, showing how this method can be applied in practice.