



**THE UNIVERSITY OF GEORGIA  
DEPARTMENT OF STATISTICS**

# *Colloquium Series*

## **Frederick Kin Hing Phoa**

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**Monday, May 13, 2019**

3:30pm in room 434, Brooks Hall

### **An Efficient Search of Optimal Experimental Designs via Swarm Intelligence**

Swarm intelligence is well-known to enjoy fast convergence towards optimum. Recently, the Swarm Intelligence Based (SIB) method was proposed to deal with discrete optimization problems in mathematics and statistics. In this talk, the traditional framework of the SIB method, commonly known as SIB 1.0, is introduced and a demonstration on obtaining  $E(s_2)$ -optimal supersaturated design using the SIB method is given. Then an augmented version of the SIB method, namely SIB 2.0, is proposed for a wider application when the particle size is either unknown or varied, and a demonstration on the change point analysis is given. At the end of this talk, we discuss a smart initialization procedure to improve the computational efficiency of the SIB method. We demonstrated the use of the SIB method, initialized by both the uniform pool (standard procedure) and the MCMC pool (smart initialization), on the search of optimal minimum energy designs.

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