Proposal for Special Session at IEEE CASE 2022

Goal:

Stochastic simulation is a powerful modeling tool for analyzing complex systems, particularly when closed-form analytical models are unable to capture requisite details for an accurate and tractable estimation of the system. Indeed, simulation makes it possible to reproduce the system dynamics by means of logically complex, and often nonmathematical models. Healthcare systems, electric power grids, air and land traffic control systems, communication networks, manufacturing plants and supply chains are all examples of complex systems to which simulation can be applied to. Simulation can be further coupled with optimization algorithms, enabling a powerful search for the optimal solution even under simulation noise. Such a coupling is referred to as simulation-based optimization.

Although the advance of computer technology has dramatically increased computational power, thereby reducing the time required to run simulation models, efficiency remains a significant concern for simulation-based optimization. On the one hand, the solution space can be extremely large, and this is even more challenging when little is known about the structure of the solution space. On the other hand, simulation experiments are typically expensive and time-consuming in practice. Further, acquiring a good estimate for the performance of a solution usually requires a large number of simulation samples. These observations explain the increasing popularity of research in efficient simulation-based optimization algorithms.

The goal of this special session is to provide some recent developments in the methodology of simulation-based optimization as well as their real-world applications.

Session Title: Recent Advances in Theory and Applications of Simulation-based Optimization

Organizers: Siyang Gao, Associate Professor
City University of Hong Kong
E-mail: siyangao@cityu.edu.hk
Phone: +852-3442-4759

Weiwei Chen, Associate Professor
Rutgers University
E-mail: wchen@business.rutgers.edu
Phone: +1-848-445-9471

Examples of Potential and Invited Speakers:

1. Jie Song (Peking University, China)
2. Li Xia (Sun Yat-sen University, China)
3. (Samuel) Qing-Shan Jia (Tsinghua University, China)
4. Giulia Pedrielli (Arizona State University, USA)
5. Jie Xu (George Mason University, USA)
6. Chun-Hung Chen (George Mason University, USA)
7. Si Zhang (Shanghai University, China)
8. Loo Hay Lee (National University of Singapore, Singapore)
9. Leyuan Shi (University of Wisconsin - Madison, USA)
10. Enlu Zhou (Georgia Institute of Technology, USA)
11. Xiaolei Xie (Tsinghua University, China)
12. Mengchu Zhou (New Jersey Institute of Technology, USA)
13. Xiren Cao (Shanghai Jiaotong University, China)
14. Kan Wu (Nanyang Technological University, Singapore)
15. Hui Xiao (Southwestern University of Finance and Economics, China)
16. Haobin Li (National University of Singapore, Singapore)
17. Jun Luo (Shanghai Jiaotong University, China)

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18. Lu Zhen (Shanghai University)
19. Andrea Matta (Politecnico di Milano, Italy)
20. Yijie Peng (Peking University, China)
21. Zhongshun Shi (University of Tennessee, USA)
22. Xi Chen (Virginia Tech, USA)
23. Wei Xie (Northeastern University, USA)