

Computer Science Seminar Series

National Capital Region

Efficient Simulation-based Optimization via Optimal Search, Sampling, and Space Transformation

Speaker: Prof. Chun-Hung Chen

George Mason University

Friday, February 9, 2018

1:00PM- 2:00PM, NVC T3

Abstract

Simulation is a powerful modeling and software tool for analyzing modern complex systems that arise in manufacturing, power grids, transportation, healthcare, finance, defense, and many other fields. Detailed dynamics of complex, stochastic systems can be modeled in simulation. This capability complements the inherent limitation of traditional optimization, so the combining use of simulation and optimization is growing in popularity. This seminar discusses the computational issues in such a combination, and presents our effective approaches. Our approach aims to maximize the efficiency of finding a good solution, via optimally searching the solution space and sampling the simulation replications. Further, we propose to transform the solution space into a smart space which is smoother and has nice properties. Thus, the search becomes easier and more efficient in the transformed space. A key component of our methodologies is a new technique called Optimal Computing Budget Allocation (OCBA) initially developed by the speaker.

Biography

Chun-Hung Chen received his Ph.D. degree from Harvard University in 1994. He is currently a Professor at George Mason University. Dr. Chen was an Assistant Professor at the University of Pennsylvania before joining GMU. He was also a professor at National Taiwan University (Electrical Eng. and Industrial Eng.) from 2011-14. Dr. Chen was awarded with “National Thousand Talents” in 2011 (via Peking University). Sponsored by NSF, NIH, DOE, NASA, FAA, Missile Defense Agency, and Air Force in US, he has worked on the development of very efficient methodology for simulation-based decision making and its applications. He has served as a Department Editor for IIE Transactions, Department Editor for Asia-Pacific Journal of Operational Research, Associate Editor for IEEE Transactions on Automation Science and Engineering, Associate Editor for IEEE Transactions on Automatic Control, Area Editor for Journal of Simulation Modeling Practice and Theory, Advisory Editor for International Journal of Simulation and Process Modeling, and Advisory Editor for Journal of Traffic and Transportation Engineering. Dr. Chen is the author of two books, including a best seller: “Stochastic Simulation Optimization: An Optimal Computing Budget Allocation”. He is an IEEE Fellow.