



Chun-Hung Chen, PhD

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Education

PhD, Division of Engineering and Applied Sciences, Harvard University

Key Interests

Stochastic Simulation | Simulation-Based Decision Making | Learning-Based Simulation Optimization | Optimal Computing Budget Allocation | Simulation Modeling

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SELECT PUBLICATIONS

- › C. Chen *et al.*, Efficient simulation sampling allocation using multi-fidelity models. *IEEE Transactions on Automatic Control*, 64(8), 3156-3169, (2019).
- › C. Chen *et al.*, Optimal computing budget allocation for particle swarm optimization in stochastic optimization. *IEEE Transactions on Evolutionary Computation*, 21(2), 206-219, (2017).
- › C. Chen *et al.*, Equipment utilization enhancement in photolithography area through a dynamic system control using multi-fidelity simulation optimization with big data technique. *IEEE Transactions on Semiconductor Manufacturing*, 30(2), 166-175, (2017).

Research Focus

My research mainly focuses on the Optimal Computing Budget Allocation (OCBA) method. OCBA is a framework that maximizes the overall efficiency of the entire simulation optimization process. OCBA is the first solution in literature to optimally determine which alternatives to simulate and how many simulations to run for each selected alternative, leading to orders of magnitude of speedup compared to prior methods. I had also successfully applied it to projects sponsored by the NSF, NIH, DOE, NASA, FAA, Missile Defense Agency, and Air Force. OCBA has advanced the use of simulation and optimization in real-world, complex systems in manufacturing, health care, transportation, logistics, and defense systems.

Current Projects

- "Towards Self-healing Resilient Microgrids Using DDDAS", sponsored by US Air Force Office of Scientific Research
- "Scalable Multi-Model Data Acquisition and Resource Allocation via Adaptive Multi-Fidelity Simulation and Optimization in Dynamic Data Systems", sponsored by NSF
- "Improving Search Efficiency in Engineering Design by Integrating Multiple Models at Different Fidelities", sponsored by NSF
- "Rolling Resilience through Digital Twinning for the Port of Singapore", sponsored by Singapore Maritime Institute