Prospects for the application of novel methodologies and frameworks related to the design and analysis of complex engineering systems has come about due to recent progress in heuristic optimization technologies within industrial settings. Operational and financial stresses in tandem with the demands of customers, both external and internal, have intensified pressure for competent industrial operations. The evolution of complex systems operating within intricate environments has placed pressure on the configuration and performance of agile, efficient, and flexible industrial operations. Firms are recognizing that the continual enhancement of existing operations is essential to gaining and holding a competitive edge. Government organizations today can effectively evaluate solutions for complex challenges in transportation, health care, security, or environmental effects before making decisions.

The growth in computational power allowed in particular the description and resolution of complex issues using heuristic optimizations and modeling and simulation (M&S). In many engineering and business applications, optimization and M&S tools have been used independently to generate, describe, or analyze solutions. Numerous simulation-based optimization approaches have been developed and blended in complex techniques that are able to adequately approximate plausible solutions.

Traditionally, optimization models have been viewed as normative techniques while M&S frameworks are commonly used to evaluate the performance of optimization heuristics, describe a complex system, or perform sensitivity analyses. However, there exists an intersection between optimization models and M&S in which both are used in conjunction to envision and produce feasible and attainable solutions. Together, these tools offer a powerful framework from which to approach complex problems and obtain superior performance solutions. Within this setting, we foresee the growth of a promising domain characterized by the closer integrative use of both heuristic optimization and M&S.

This Special Issue of the SIMULATION Journal aims to highlight academic foundations as well as real-world industrial applications focusing on lessons learned, experienced constraints, and proof of concepts and generalizability of implemented solutions. Authors of high quality, unpublished contributions to this field of Modeling and Simulation are invited to submit papers to this Special Issue.
This special issue is aimed to solicit papers on the following topics of interest, but not limited to:

- Facility Layout Optimization
- Transportation Optimization
- Support of Environmental Science
- Optimization in Business Applications
- Optimization support in Engineering Domains (such as Biomedical, Chemical, Civil, Computer, Electrical, and Mechanical)

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For manuscript formatting and other guidelines, please visit the [Author Guidelines for SIMULATION](#) page.

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**Due Dates**

- Full papers due: April 15, 2011
- Notification of acceptance: June 30, 2011
- Minor Revisions due: July 30, 2011
- Major Revisions due: August 30, 2011
- Expected date of publication: Summer 2012

**Final Paper Submissions**

Each final submission must be prepared based on the Simulation journal requirements (see the [Author Guidelines for SIMULATION](#) page).

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