CALL FOR PAPERS

Mini-Symposium on

Surrogate- and Knowledge-Based Optimization Procedures for Computationally Expensive Engineering Design Problems

2nd International Conference on Engineering Optimization

Lisbon, September 6 – 9, 2010

The use of computer simulations is ubiquitous in contemporary engineering design. High-fidelity numerical models are very accurate but, at the same time, computationally expensive. Depending on the structure complexity and the required accuracy level, evaluation time for a single design can take hours, days or even weeks. Therefore, direct use of high-fidelity simulations in the optimization loop may be prohibitive. On the other hand, simulation-driven design is the only option in many cases due to complexity of the structure under consideration and the lack of analytical models and/or systematic design procedures. In such instances, computationally efficient design can be performed using surrogate-based optimization (SBO), where the high-fidelity model is replaced by its computationally cheap but still reasonably accurate representation, a surrogate. The surrogate model can be created using various approximation schemes. The surrogate can also be knowledge-based, i.e., constructed from the low-fidelity model that enjoys the same physics as the high-fidelity one. One of the important goals of SBO procedures is to reduce the number of high-fidelity model evaluations, and, consequently, to lower the overall optimization cost. This mini-symposium will be a part of the Second International Conference on Engineering Optimization. It aims at reviewing state-of-the-art and promoting new directions of surrogate-based and knowledge-based methodologies for efficient optimization of computationally expensive engineering problems.

Topics include (but not limited to):

- Computationally efficient optimization of expensive objective functions;
- Simulation-driven design;
- Function-approximation-based and physics-based surrogate models;
- Surrogate-based modeling and optimization;
- Multi-fidelity analysis and optimization;
- Knowledge-based methods;
- Response surface approximation, space mapping, and response correction techniques;
- Application case studies.

Authors wishing to have their contribution considered for the mini-symposium should submit the abstract (up to 500 words) before March 5, 2010, using the online submission system of the EngOpt 2010 conference and selecting this mini-symposium as a primary topic. More information about the conference and the submission process can be found at http://www.engopt2010.org/.

Organizers:

Slawomir Koziel
Engineering Optimization & Modeling Center
School of Science and Engineering
Reykjavik University
101 Reykjavik
Iceland
koziel@ru.is

Leifur Leifsson
Laboratory for Unmanned Vehicles
School of Science and Engineering
Reykjavik University
101 Reykjavik
Iceland
leifurth@ru.is