Mathematical Problems in Engineering

Hindawi

Special Issue on

Applications of Interval Techniques and Other Techniques with Automatic Results Verification to Opimization in Engineering

CALL FOR PAPERS

Optimization problems are important in engineering; however, many optimization techniques currently used in engineering application are semiheuristic, and they do not guarantee that the results of applying these technqiues are indeed optimal. Such guarantees can be provided if we use optimization techniques that provide automatic result verification. To provide desirable guarantees, we need to take into account that, due to measurement uncertainty, we only know approximate values of the numerical characteristics describing engineering systems. Often, the only information that we have about the measurement uncertainty is the upper bound on the measurement error; in such cases, all we know about the actual value of the corresponding characteristic is the interval containing this value. Techniques for processing such interval data, interval computation and interval analysis, are powerful mathematical techniques applied in many areas including uncertainty modelling, constraint programming, and numerical verification. These techniques are often the essential ingredients for developing robust, reliable, and efficient algorithms in optimization.

The aim of this special issue is to bring together contributions in engineering optimization and operations research that use interval approach (and other techniques with automatic results verification) as the main or auxiliary mathematical tool. Contributions in closely related areas, however, are encouraged as well. We welcome contributions to theory, algorithms, and/or applications.

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. All papers are refereed through a peer-review process.

Potential topics include, but are not limited to:

- Interval computation in engineering
- Robustness in engineering optimization and operations research
- Global optimization and constraint solving, including optimization in dynamical systems and control
- Verification in numerical methods
- Reliability in engineering computations
- Mathematical treatment of uncertainty and sensitivity analysis in engineering problems
- Use of interval computations to process fuzzy uncertainty in engineering problems

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