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DAKOTA SOFTWARE FOR OPTIMIZATION, UNCERTAINTY QUANTIFICATION AND MODEL CALIBRATION 800

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ABSTRACT

Driven by Sandia National Laboratories' applications, the Dakota project (`http://dakota.sandia.gov`) invests in both state-of-the-art research and robust, usable software for optimization and uncertainty quantification (UQ). Dakota enables the users to run, with a minimal setup overhead, a variety of algorithms ranging from advanced parametric analysis for design exploration to model calibration, risk analysis, and quantification of margins and uncertainty with computational models. Dakota's methods include optimization, uncertainty quantification, parameter estimation, and sensitivity analysis, which may be used individually or as components within surrogate-based, sampling-based and other advanced strategies as multilevel/multifidelity UQ [1, 2]. The software is available publicly under an open source license and is used broadly by academic, government, and corporate institutions. In this minisymposium we will accept contributions on recent developments and improvements to Dakota in the areas of algorithms and its ease of use, and application of Dakota capabilities to engineering and scientific problems.

REFERENCES

[1] Dakota, a multilevel parallel object-oriented framework for design optimization, parameter estimation, uncertainty quantification, and sensitivity analysis: Version 6.7 theory manual. Technical Report SAND2014-4253, Sandia National Laboratories, Albuquerque, NM, Updated November 2018. Available online from `http://dakota.sandia.gov/documentation.html`.

[2] Dakota, a multilevel parallel object-oriented framework for design optimization, parameter estimation, uncertainty quantification, and sensitivity analysis: Version 6.7 users manual. Technical Report SAND2014-4633, Sandia National Laboratories, Albuquerque, NM, Updated November 2018. Available online from `http://dakota.sandia.gov/documentation.html`.