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DAKOTA SOFTWARE FOR OPTIMIZATION, UNCERTAINTY QUANTIFICATION AND MODEL CALIBRATION

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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). Written in C++, the Dakota toolkit provides a flexible, extensible interface between simulation codes and a variety of iterative systems analysis methods. Dakota enables the users to run, with a minimal setup overhead, a variety of algorithms. Dakota's methods include optimization, uncertainty quantification, parameter estimation, and sensitivity analysis, which may be used individually or as components within surrogate- or sampling-based strategies and other advanced techniques as 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 describing Dakota algorithm and usability developments. We also solicit contributions focused on advanced application of Dakota capabilities to science and engineering problems, whether academic or industrial.

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*.