

Abstract Submitted  
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**Delaunay-based derivative-free optimization for efficient minimization of time-averaged statistics of turbulent flows.** POORIYA BEYHAGHI, University of California, San Diego — This work considers the problem of the efficient minimization of the infinite time average of a stationary ergodic process in the space of a handful of independent parameters which affect it. Problems of this class, derived from physical or numerical experiments which are sometimes expensive to perform, are ubiquitous in turbulence research. In such problems, any given function evaluation, determined with finite sampling, is associated with a quantifiable amount of uncertainty, which may be reduced via additional sampling. This work proposes the first algorithm of this type. Our algorithm remarkably reduces the overall cost of the optimization process for problems of this class. Further, under certain well-defined conditions, rigorous proof of convergence is established to the global minimum of the problem considered.

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