

Noisyopt: A Python library for optimizing noisy functions.

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Software

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Summary

Optimization problems have great practical importance across many fields. Sometimes a precise evaluation of the function to be optimized is either impossible or exceedingly computationally expensive. An example of the former case is optimization based on a complex simulation, an example of the latter arises in machine learning where evaluating a loss function over the complete data set can be too expensive. Optimization based on noisy evaluations of a function is thus an important problem.

Noisyopt provides optimization algorithms tailored to noisy problems with a call syntax compatible with `scipy.optimize` (Jones et al. 2001–2001--) routines. It implements a derivative-free algorithm robust to noise – adaptive pattern search (Mayer et al. 2016), and a stochastic approximation algorithm using simultaneous perturbations (Spall 1998). Bound constraints on variables are supported. The library also has methods for finding a root of a noisy function by an adaptive bisection algorithm.

References

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