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*Imaginary Derivative Free Optimization*

Consider the problem of minimizing an objective function that is provided by a blackbox. Suppose that, while the optimization problem seeks a real-valued solution, the blackbox is capable of accepting complex-valued input and returning complex-valued output. We explore using complex-variables in a model-based derivative-free optimization method. We begin by discussing how to construct such a model and then present the results of some numerical experiments. Results suggest that the quality of a model-based DFO algorithm is (i) highly impacted by the number of function evaluations required to create the models and (ii) also impacted by the accuracy of the created models, but to a lesser degree.