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Albert Berahas*, albertberahas@lehigh.edu. *A Theoretical and Empirical Comparison of Gradient Approximations in Derivative-Free Optimization: Algorithms, Convergence Analysis and Noise.*

This is the first of two talks on gradient approximations in derivative-free optimization (DFO). In this part, we present and analyze a general line search DFO algorithm. To this end, we derive a simple condition on the accuracy of gradient approximations which guarantees fast and reliable convergence rates for the method. We analyze the convergence properties even when this condition is only satisfied with some sufficiently large probability at each iteration. We also present results for the case where the function evaluations are contaminated with some level of noise. Joint work with Liyuan Cao, Krzysztof Choromanski and Katya Scheinberg. (Received September 17, 2019)