

1154-65-2061 **Katya Scheinberg***, katyascheinberg@gmail.com. *A Theoretical and Empirical Comparison of Gradient Approximations in Derivative-Free Optimization: Gradient Approximations, Noise and Numerical Experiments.*

This is the second of two talks on gradient approximations in derivative-free optimization (DFO). In this part, we analyze several methods for approximating the gradient of a function using only function values. The methods differ in the number of functions sampled, the choice of the sample points and the way in which the gradient approximations are defined. For each method, we derive bounds on the number of samples and the sampling radius which guarantee the favorable convergence properties for a line search or fixed step size descent method presented in Part I. We verify our theoretical findings with numerical experiments on synthetic problems as well as on reinforcement learning problems. Joint work with Albert S. Berahas, Liyuan Cao and Krzysztof Choromanski. (Received September 17, 2019)