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Randomized Gauss-Newton methods for large scale nonlinear least-squares

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We address the solution of large-scale nonlinear least-squares problems by stochastic Gauss-Newton methods combined with a line-search strategy. The algorithms proposed have per-iteration computational complexity lower than classical deterministic methods, due to the employment of random models inspired by randomized linear algebra tools. Under suitable assumptions, the stochastic optimization procedures can achieve a desired level of accuracy in the first-order optimality condition. We discuss the construction of the random models and the iteration complexity results to drive the gradient below a prescribed accuracy.

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