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Deanna Needell* (dneedell@cmc.edu), 850 Columbia Ave, Claremont, CA 91711, and **Rachel Ward**. *Batched Stochastic Gradient Descent with Weighted Sampling*.

We analyze a batched variant of Stochastic Gradient Descent (SGD) with weighted sampling distribution for smooth and non-smooth objective functions. We show that when the batches can be distributed computationally that a significant speedup in the convergence rate is possible. We propose several computationally efficient schemes to approximate the optimal weights, and compute the proposed sampling distribution for the least-squares and hinge loss problems. We show both analytically and experimentally that substantial gains can be obtained using this hybrid approach. (Received August 18, 2016)