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We consider the problem of low rank matrix recovery in a stochastically noisy high dimensional setting. We propose a new estimator for the low rank matrix, based on the iterative hard thresholding method, and that is computationally efficient and simple. We prove that our estimator is optimal both in terms of the Frobenius risk, and in terms of the entry-wise risk uniformly over any change of orthonormal basis. This result allows us, in the case where the design is Gaussian, to provide the limiting distribution of the estimator, which is of great interest for constructing tests and confidence sets for low dimensional subsets of entries of the low rank matrix.