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Henry Adams, Lara Kassab* (lara.kassab@colostate.edu) and **Deanna Needell.** *An Adaptation for Iterative Structured Matrix Completion.*

The task of filling-in or predicting missing entries of a matrix, from a subset of known entries, is known as *matrix completion*. Structured matrix completion includes any setting in which data is not missing uniformly at random. In recent work, a modification to the standard nuclear norm minimization (NNM) for matrix completion has been developed to take into account *sparsity-based* structure in the missing entries. This notion of structure is motivated in many settings including recommender systems, where the probability that an entry is observed or not depends on the value of the entry. We propose adjusting an Iteratively Reweighted Least Squares (IRLS) algorithm for low-rank matrix completion to take into account sparsity-based structure in the missing entries. We also present an iterative gradient-projection-based implementation of the algorithm that can handle large-scale matrices. Finally, we present a robust array of numerical experiments on matrices of varying sizes, ranks, and level of structure. We show that our proposed method is comparable with the adjusted NNM on small structured matrices. Further, we show that our proposed method often outperforms the IRLS algorithm in structured settings on matrices up to size 1000×1000 . (Received August 29, 2020)