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Pedro Felzenszwalb (pff@brown.edu), **Caroline Klivans** (caroline_klivans@brown.edu) and **Alice Paul*** (alice_paul@brown.edu). *Clustering with Iterated Linear Optimization.*

We introduce a novel method for clustering using a semidefinite programming (SDP) relaxation of the Max k-Cut problem. The approach is based on a new methodology for rounding the solution of an SDP using iterated linear optimization. We show the vertices of the Max k-Cut SDP relaxation correspond to partitions of the data into at most k sets. We also show the vertices are attractive fixed points of iterated linear optimization. We interpret the process of fixed point iteration with linear optimization as repeated relaxations of the closest vertex problem. Our experiments show that using fixed point iteration for rounding the Max k-Cut SDP relaxation leads to significantly better results when compared to randomized rounding. (Received January 11, 2021)