

Analysis of Greedy Approximation with Non-submodular Potential Functions

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In recent work of Du, Graham, Wan, Wu and Zhao, we introduced a new method which can analyze a large class of greedy approximations with non-submodular potential functions, including some long-standing heuristics for Steiner trees, connected dominating sets, and power-assignment in wireless networks. There exist many greedy approximations for various combinatorial optimization problems, such as set covering, Steiner tree, subset-interconnection designs, etc.. There are also many methods to analyze these in the literature. However, all of the previously known methods are suitable only for those greedy approximations with submodular potential functions.