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**Approximation Guarantees
for Max Sum and Max Min Facility Dispersion
with Parameterised Triangle Inequality
and Applications in Result Diversification**

Facility Dispersion Problem, originally studied in Operations Research, has recently found important new applications in Result Diversification approach in information sciences. This optimisation problem consists of selecting a small set of p items out of a large set of candidates to maximise a given objective function.

The function expresses the notion of dispersion of a set of selected items in terms of a pair-wise distance measure between items. In most known formulations the problem is NP-hard, but there exist 2-approximation algorithms for some cases if distance satisfies triangle inequality.

We present generalised $2/\alpha$ approximation guarantees for the Facility Dispersion Problem in its two most common variants: Max Sum and Max Min, when the underlying dissimilarity measure satisfies parameterised triangle inequality with parameter α . The results apply to both relaxed and strengthen variants of the triangle inequality.

We also demonstrate potential applications of our findings in the result diversification problem including web search or entity summarisation in semantic knowledge graphs, as well as in practical computations on finite data sets.