Title

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Abstract

We aim to prove the Normed Path conjecture, which has algorithmic implications.

Theorem 0.1. *(Normed Path Conjecture) If $\boldsymbol{d}$ is a demand that's feasible with congestion 1 in the unit weighted graph, then for any*

$$\Omega\left(\log^{O(1)} n\right) \leq p_1 \leq p_2 \leq \left(1 + \frac{1}{\log^{O(1)} n}\right) p_1, \tag{1}$$

aka p_1 and p_2 are close to each other, and are big, we have for all edges e:

$$|f(p_1)_e - f(p_2)_e| \leq 0.1\left(1 + \frac{10\log n}{p} - |f(p_1)_e|\right) \tag{2}$$

Where

$$f(p) := \arg\min_{f:B^T f = d} \sum_{e \in G} \left(|x|^p + \sum_{q < p, q = 1.1^i, i \in \mathbb{Z}_+} |x|^q\right)$$