

1155-15-193

Kevin Pratt*, 5700 Ellsworth Ave, Apt. A4, Pittsburgh, PA 15232. *Waring Rank, Parameterized and Exact Algorithms.*

Given nonnegative integers n and d , where $n \gg d$, what is the minimum number r such that there exist linear forms $\ell_1, \dots, \ell_r \in \mathbb{C}[x_1, \dots, x_n]$ so that $\ell_1^d + \dots + \ell_r^d$ is supported exactly on the set of all degree- d multilinear monomials in x_1, \dots, x_n ? We show that this and related questions have intimate connections to the areas of parameterized and exact algorithms in computer science, generalizing earlier methods and providing a concrete approach to obtain faster approximate counting and deterministic decision algorithms. As an application we give faster algorithm for approximately counting subgraphs of bounded treewidth, improving on earlier work of Alon et al. (Received January 13, 2020)