On the Buratti-Horak-Rosa Conjecture for Small Supports

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Label the vertices of the complete graph K_v with the distinct elements of $\mathbb{Z}_v$ and define the *length* ℓ of each edge as the cyclical distance between labels of its end-vertices. A Hamiltonian path through K_v is called a *realization* of a given multiset L if its edge labels are L. The *Buratti-Horak-Rosa Conjecture* is that there is a realization for a multiset L if and only if for any divisor d of v the number of multiples of d in L is at most $v - d$.

The toroidal lattice of vertices associated with each multiset was shown to be useful for constructing special types of realizations, the concatenations of which yield realizations for larger multisets [1, 2, 3, 4]. We will present our recent constructions yielding "standard linear realizations" for multisets with support of the form $\{1, x, y\}$ whenever the number of 1-edges is at least $\max(x, y) + \gcd(x, y) - 1$. These constructions considerably extend the parameters for which the conjecture is known to hold.

References

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