

Abstract

New methods to attack the Buratti-Horak-Rosa conjecture

John R. Schmitt

Middlebury College, Vermont, USA

The conjecture, still widely open, posed by Marco Buratti, Peter Horak and Alex Rosa states that a list L of $v - 1$ positive integers not exceeding $\lfloor \frac{v}{2} \rfloor$ is the list of edge-lengths of a suitable Hamiltonian path of the complete graph with vertex-set $\{0, 1, \dots, v - 1\}$ if and only if, for every divisor d of v , the number of multiples of d appearing in L is at most $v - d$. We present new methods that are based on linear realizations that can be applied to prove the validity of this conjecture for a vast choice of lists. As example of their flexibility, we consider lists whose underlying set is one of the following: $\{x, y, x + y\}$, $\{1, 2, 3, 4\}$, $\{1, 2, 4, \dots, 2x\}$, $\{1, 2, 4, \dots, 2x, 2x + 1\}$. We also consider lists with many consecutive elements.

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