Calculating the extremal number $ex(v; \{C_3, C_4, \ldots, C_n\})$. (English) Zbl 1184.05069

Summary: By the extremal number $ex(v; \{C_3, C_4, \ldots, C_n\})$ we denote the maximum number of edges in a graph of order $v$ and girth at least $g \geq n+1$. The set of such graphs is denoted by $EX(v; \{C_3, C_4, \ldots, C_n\})$.

In 1975, Erdős mentioned the problem of determining extremal numbers $ex(v; \{C_3, C_4\})$ in a graph of order $v$ and girth at least five. In this paper, we consider a generalized version of the problem for any value of girth by using the hybrid simulated annealing and genetic algorithm (HSAGA). Using this algorithm, some new results for $n \geq 5$ have been obtained. In particular, we generate some graphs of girth 6, 7 and 8 in some cases have more edges than corresponding cages. Furthermore, future work will be described regarding the investigation of structural properties of such extremal graphs and the implementation of HSAGA using parallel computing.

MSC: 05C35 Extremal problems in graph theory

Keywords: extremal graph; cages; extremal number

Full Text: DOI

References:

[23] Simonovits, M., (), 161-200

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.