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# Degree-Based Spanning Tree Optimization

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Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | approximation algorithms and relationship to graph vulnerability | We consider several spanning tree optimization problems all having a measure function which depends only on the degrees of the resulting spanning tree. In addition, all investigated problems are generalizations of the Hamiltonian Path problem and so are NP-hard. As we cannot expect exact polynomial-time solutions, we use the approach of approximation algorithms. We look for a suboptimal solution in polynomial time and prove that it is not farther from the optimal one than a given approximation factor. Beside algorithmic aspects, we also consider the number of spanning tree leaves from a bit more theoretical point of view. We investigate how different graph vulnerability parameters, namely scattering number and cut-asymmetry, are related to the number of spanning tree leaves and that of independent spanning tree leaves. Some of our results are applied for the analysis of the Maximum Internal Spanning Tree problem, while some others give connection to the theory of hamiltonicity. In particular, we give a sufficient condition for the existence of a Hamiltonian path by means of cut-asymmetry. | Format: Paperback | Language/Sprache: english | 176 gr | 220x150x6 mm | 120...



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