

AN EXPERIMENTAL COMPARISON OF BIASED AND UNBIASED RANDOM- KEY GENETIC ALGORITHMS*

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Abstract

Random key genetic algorithms are heuristic methods for solving combinatorial optimization problems. They represent solutions as vectors of randomly generated real numbers, the so-called random keys. A deterministic algorithm, called a decoder, takes as input a vector of

random keys and associates with it a feasible solution of the combinatorial optimization problem for which an objective value or fitness can be computed. We compare three types of random-key genetic algorithms: the unbiased algorithm of Bean (1994); the biased algorithm of Gonçalves and Resende (2010); and a greedy version of Bean's algorithm on 12 instances from four types of covering problems: general-cost set covering, Steiner triple covering, general-cost set k -covering, and unit-cost covering by pairs. Experiments are run to

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Keywords: genetic algorithm, biased random-key genetic algorithm, random keys, combinatorial optimization, heuristics, metaheuristics, experimental algorithms

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Isabel do Rio Negro; PNJ = Parque Nacional do Jaú, Amazonas, Brasil; MAN = Manaus, Amazonas, Brasil; XIN = Baixo Xingú, Pará, Brasil; PNA = Parque Nacional da Amazônia, Amazonas/Pará, Brasil; PNSD = Parque Nacional da Serra do Divisor, Acre, Brasil; BAL = Balta, Ucayali, Peru; MNU = Parque Nacional de Manu, Madre de Dios, Peru; CUZ = Reserva Cuzco Amazônico, Madre de Dios, Peru e MTP = Médio Teles Pires, Mato Grosso, Brasil.

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APÊNDICE

Espécies de morcegos registradas em sub-bosque em 15 localidades amostradas na Amazônia e utilizadas nas análises de similaridade e auto-correlação espacial de morcegos da Amazônia: IWO = Iwokrama Forest, Guiana; PAR = Paracou, Guiana Francesa; ARA = Baixo Arataye, Guiana Francesa; FLAM = Floresta Nacional do Amapá, Amapá, Brasil; PNMT = Parque Nacional das Montanhas do Tumucumaque, Amapá, Brasil; BAR = Barcelos e Santa

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