

HEURISTICS BASED ON GREEDY RANDOMIZED ADAPTIVE SEARCH AND VARIABLE NEIGHBOURHOOD SEARCH FOR THE MINIMUM LABELLING SPANNING TREE PROBLEM

Consoli S. ⁽¹⁾, Darby-Dowman K. ⁽¹⁾, Mladenović N. ⁽¹⁾, and Moreno José A. ⁽²⁾

Abstract: This paper studies metaheuristics for the minimum labelling spanning tree (MLST) problem. Given an undirected labeled connected graph, we wish to find a spanning tree whose edges have the smallest number of distinct labels. A Greedy Randomized Adaptive Search Procedure (GRASP) and different versions of Variable Neighborhood Search (VNS) are proposed. They are compared with the other algorithms recommended in the literature: Genetic Algorithm and Pilot Method. Nonparametric statistical tests show that the heuristics based on GRASP and VNS outperform the other algorithms tested.

Keywords: Metaheuristics, Combinatorial optimization, Graphs and Networks.

¹ CARISMA, NET-ACE. *School of Information Systems, Computing and Mathematics, Brunel University, Uxbridge, Middlesex, UB8 3PH (United Kingdom)*. Email-addresses (in order): sergio.consoli@brunel.ac.uk, kenneth.darby-dowman@brunel.ac.uk, nenad.mladenović@brunel.ac.uk.

² DEIOC, IUDR. *Universidad de La Laguna, Facultad de Matemáticas, 4a planta Astrofísico Francisco Sánchez s/n, 38271, La Laguna de Santa Cruz de Tenerife (Spain)*. Email-address: jamoreno@ull.es