OPTIMAL BACKBONE COLORING OF SPLIT GRAPHS WITH MATCHING BACKBONES

KRZYSZTOF TUROWSKI¹

Gdańsk University of Technology
Department of Algorithms and System Modelling

e-mail: Krzysztof.Turowski@eti.pg.gda.pl.

Abstract

For a graph G with a given subgraph H , the backbone coloring is defined as the mapping $c : V(G) \rightarrow \mathbb{N}_+$ such that $|c(u) - c(v)| \geq 2$ for each edge $\{u, v\} \in E(H)$ and $|c(u) - c(v)| \geq 1$ for each edge $\{u, v\} \in E(G)$. The backbone chromatic number $BBC(G, H)$ is the smallest integer k such that there exists a backbone coloring with $\max_{v \in V(G)} c(v) = k$.

In this paper, we present the algorithm for the backbone coloring of split graphs with matching backbone.

Keywords: backbone coloring, split graphs, matching.

2010 Mathematics Subject Classification: 05C15.

REFERENCES

- [1] P. Hammer and S. Földes, *Split graphs*, Congr. Numer. **XIX** (1977) 311–315.
- [2] J. Miškuf, R. Škrekovski and M. Tancer, *Backbone colorings of graphs with bounded degree*, Discrete Appl. Math. **158** (2010) 534–542.
doi:10.1016/j.dam.2009.11.015
- [3] H. Broersma, F.V. Fomin, P.A. Golovach and G.J. Woeginger, *Backbone colorings for graphs: tree and path backbones*, J. Graph Theory **55** (2007) 137–152.
doi:10.1002/jgt.20228
- [4] H. Broersma, *A general framework for coloring problems: old results, new results, and open problems*, in: Combinatorial Geometry and Graph Theory: Indonesia-Japan Joint Conference, IJCCGGT 2003, Bandung, Indonesia, J. Akiyama, E.T. Baskoro, M. Kano (Ed(s)), (Springer, 2003) 65–79.

¹This project has been partially supported by Narodowe Centrum Nauki under contract DEC-2011/02/A/ST6/00201.

- [5] R. Janczewski, *On an interrelation between travelling salesman problem and T-coloring of graphs*, Proceedings of the Sixth International Conference: Advanced Computer Systems, ACS 1999, Szczecin, Poland (1999) 23–25.

Received 1 December 2011

Revised 18 November 2013

Accepted 1 May 2014