

Generalization of edge general position problem*

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Dedicated to Dragan Marušič on the occasion of his 70th birthday.

Received 18 December 2023, accepted 27 January 2024, published online 20 February 2025

Abstract

The edge geodesic cover problem of a graph G is to find a smallest number of geodesics that cover the edge set of G . The edge k -general position problem is introduced as the problem to find a largest set S of edges of G such that at most $k - 1$ edges of S lie on a common geodesic. We show that these are dual min-max problems and connect them to an edge geodesic partition problem. Using these connections, exact values of the edge k -general position number is determined for different values of k and for various networks including torus networks, hypercubes, and Benes networks.

Keywords: General position set, edge geodesic cover problem, edge k -general position problem, torus network, hypercube, Benes network.

Math. Subj. Class.: 05C12, 05C76

*We thank the reviewer for a very careful reading of the article. This work was supported and funded by Kuwait University, Kuwait and the Research Project No. is FI 02/21.

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Posplošitev povezavnega splošnega položajnega problema*

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Posvečeno Draganu Marušiču ob njegovi 70-letnici.

Prejeto 18. decembra 2023, sprejeto 27. januarja 2024, objavljeno na spletu 20. februarja 2025

Povzetek

Problem povezavnega geodetskega pokritja grafa G je: najti najmanjše število geodetk, ki pokrivajo povezavno množico grafa G . Povezavni k -splošni položajni problem vpeljemo kot problem najti največjo množico S povezav grafa G z lastnostjo, da največ $k - 1$ njenih povezav leži na skupni geodetki. Pokažemo, da sta to dualna ekstremalna problema iskanja minimuma oz. maksimuma, in ju povežemo s povezavnim partijskim problemom. Na podlagi te povezave med problemoma določimo natančne vrednosti povezavnega k -splošnega položajnega števila za različne vrednosti k in za različne mreže, vključno s torusnimi mrežami, hiperkockami in Benesovimi mrežami.

Ključne besede: Splošna položajna množica, povezavni geodetski problem pokritja, povezavni k -splošni položajni problem, torusna mreža, hiperkocka, Benesova mreža.

Math. Subj. Class.: 05C12, 05C76

*Recenzentu se zahvaljujemo za zelo natančno branje članka. To delo je podprla in financirala Kuvajtska univerza, Kuvajt, št. raziskovalnega projekta pa je FI 02/21.

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