Metric dimension of amalgamation of graphs

Rinovia Simanjuntak

(joint work with Suhadi Wido Saputro and Saladin Uttunggadewa)

A set of vertices S resolves a graph G if every vertex is uniquely determined by its vector of distances to the vertices in S. The metric dimension of G is the minimum cardinality of a resolving set of G.

Let $\{G_1, G_2, \dots, G_n\}$ be a finite collection of graphs and each G_i has a fixed vertex v_{0_i} called a terminal. The amalgamation $Amal\{G_i; v_{0_i}\}$ is formed by taking all the G_i's and identifying their terminals. Here we study the metric dimension of $Amal\{G_i; v_{0_i}\}$ for $\{G_1, G_2, \dots, G_n\}$ a finite collection of arbitrary graphs. We give lower and upper bounds for the dimension, show that the bounds are tight, and construct infinitely many graphs for each possible value of dimensions.

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