Metric dimension

The *vertex set* and the *edge set* of graph G are denoted by $V(G)$ and $E(G)$, respectively. The distance between two distinct vertices $u, v \in V(G)$, denoted by $d(u,v)$, is the length of a shortest $u-v$ path in G. Let $W = \{w_1, \ldots, w_k\}$ be an ordered subset of $V(G)$. For $v \in V(G)$, a *representation* of v with respect to W is defined as k-tuple $r(v \mid W) = (d(v, w_1), \ldots, d(v, w_k))$. The set W is a *resolving set* of G if every two distinct vertices $x, y \in V(G)$ satisfy $r(x \mid W) \neq r(y \mid W)$. A *metric basis* of G is a resolving set of G with minimum cardinality, and the *metric dimension* of G refers to its cardinality, denoted by $\beta(G)$.

The metric dimension in general graphs were first studied by Harary and Melter in 1976, and independently by Slater in 1975 and later in 1988.

Garey and Johnson in 1979 and Khuller *et al* in 1996 showed that determining the metric dimension of graph is NP-complete problem.

Study on the metric dimension of a regular graph $G(n,n)$ was initiated by Chartrand *et al.* in 2000. They obtained the result for n-regular graph $G(n,n)$. Recently, the result was generalized to complete k-partite graph by Saputro *et al.* in 2008. Chartrand *et al* also determined the metric dimension of even cycle which are isomorphic to 2-regular graph $G(n,n)$.

The purpose of the next papers is to further investigate the metric dimension of certain family of graphs, namely to determine the metric dimension of certain regular bipartite graphs.

• Saputro, S.W.- Simanjuntak, R.- Uttunggadewa, S.- Assiyatun, H.- Baskoro, E.T.- Salman, A.N.M.- Bača, M.: *The metric dimension of the lexicographic product of graphs*, **Discrete Math. 313** (2013), 1045-1051.

• Bača, M.- Baskoro, E.T.- Salman, A.N.M.- Saputro, S.W.- Suprijanto, D.: *The metric dimension of regular bipartite graphs*, **Bull. Math. Soc. Sci. Math. Roumanie 54**, No. 1 (2011), 15-28.