

## Metric Dimension of Graph Join Two Paths $P_2$ and $P_t$

Loeky Haryanto, Nurdin, and Hasmawati

Hasanuddin University, Indonesia

### Abstract

The following metric dimension of join two paths  $P_2 + P_t$  is determined as follows. For every  $k = 1, 2, 3, \dots$  and  $t = 2 + 5k$  or  $t = 3 + 5k$ , the dimension of  $P_2 + P_t$  is  $2 + 2k$ ; whereas for  $t = 4 + 5k$ ,  $t = t(k + 1)$  or  $t = 1 + 5(k + 1)$ , the dimension is  $3 + 2k$ . In case  $t \geq 7$ , the dimension is determined by a chosen (maximal) ordered basis for  $P_2 + P_t$ , in which the integers 1, 2 are the two consecutive vertices of  $P_2$  and the next integer 3, 4, ...,  $t + 2$  are the  $t$  consecutive vertices of  $P_t$ . If  $t \geq 10$ , the ordered binary string contains repeated substrings of length 5. For  $t \geq 7$ , the dimension is easily found using a computer search, or even just using hand computations.

### References

1. Chartrand, G., Eroh, L., Johnson, M.A., and Oellermann, O.R., "Resolvability in graphs and the metric dimension of a graph", *Discrete Appl. Math.*, 105 (2000), 99-113.
2. Gallian, J.A., "A dynamic survey of graph labelling", *Electron. J. Comb.*, 19 (2016), 2 (1978), 191-195.
3. Harary, F. and Melter, R.A., "On the metric dimension of a graph", *Ars Combin.*, 2 (1976), 191-195.
4. Kuziak, D., Rodrigues-Velaquez, J.A., and Yero, I.G., "Computing the metric dimension of a graph from primary subgraphs", *Discuss. Math.*, 37 (2017), 273-293.
5. Kuziak, D., Yero, I.G., and Rodrigues-Velaquez, J.A., "On the strong metric dimension of corona product graphs and join graphs", *Discrete Appl. Math.*, 161 (2013), 1022-1027.
6. Slater, P.J., "Leaves of trees", *Congr. Numer.*, 14 (1975), 549-559.