

An algebra for weighted threshold graphs

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Threshold graphs are generated from one vertex by repeatedly adding a vertex adjacent to all existing vertices or adding an isolated vertex. In the weighted threshold graph, we add a new vertex in step i , which is connected to all existing vertices by an edge of weight w_i . In this work, we consider the set \mathcal{A}_n consisting of all Laplacian matrices of weighted threshold graphs of order n . We show that \mathcal{A}_n forms a commutative algebra and find a common basis of eigenvectors for the matrices in \mathcal{A}_n . It follows that the eigenvalues of each matrix in \mathcal{A}_n can be represented as a linear transformation of the weights. The talk is based on [1].

References

- [1] Yingyue Ke, Willem H. Haemers, Piet Van Mieghem *The Laplacian matrix of weighted threshold graphs*, Electronic J. Linear Algebra, Vol. 41, 2025, 529-537.