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The Matrix Theory of Graphs

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Message from the Guest Editor

Dear Colleagues,

The topic of the matrix theory of graphs investigates the relationship between the graph theory and their associated matrix representations and it explores the matrix properties of the graphs from the point of view of linear algebra, as well as the consequences that these results have for the graphs themselves. This includes the study of

- the adjacency matrices,
- incidence matrices,
- path matrices,
- distance matrices, and
- Laplacian matrices, etc.

On the other hand, one can also define a graph according to the properties of a certain algebraic structure (for example, the commuting graph or the zero-divisor graph). The most important examples of such graphs are prescribed to the full matrix ring (or semiring) and the group of invertible matrices over a ring (or semiring). The four main cases of research interest in this area are:

- realizability,
- the problem of uniqueness,
- connectivity and diameter,
- other properties (metric dimension, chromatic number, etc.).

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Message from the Editor-in-Chief

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