

GRAPHICAL LINEAR ALGEBRA

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Linear algebra is unreasonably effective in engineering and computer science. From classical models of electrical circuits, signal flow graphs and Petri nets through more recent applications in quantum computing, data science and machine learning, much of the underlying computation and analysis is linear algebraic.

In this tutorial we will take a fresh look at the basic concepts of string algebra using a string diagrammatic language. The language arose from joint work with Filippo Bonchi and Fabio Zanasi on a presentation of the prop of linear relations — those relations that are also linear subspaces.

The talk will not be technical and will rather focus on how (1) the graphical language exposes the beautiful symmetries of linear algebra and (2) how it serves as a compositional calculus for various applications, since they, like the string diagrammatic formalism, are often diagrammatic in nature.

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