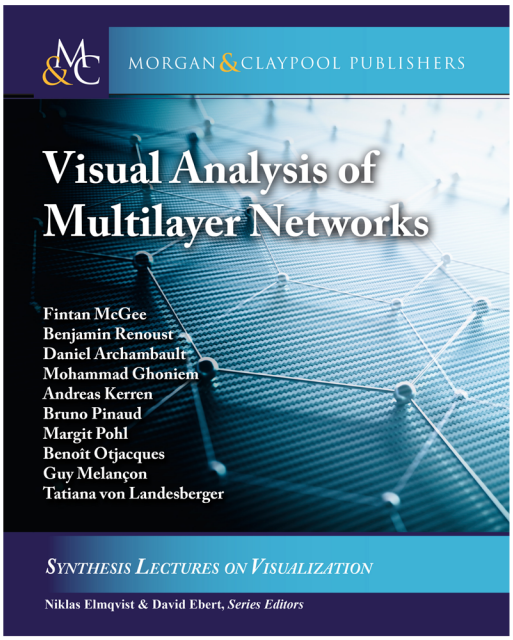
An overview and structured analysis of contemporary multilayer network visualization for researchers in visualization, and those who aim to visualize multilayer networks in the domain of complex systems, as well as those solving problems within application domains.



Visual Analysis of Multilayer Networks

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The emergence of multilayer networks as a concept from the field of complex systems provides many new opportunities for the visualization of network complexity, and has also raised many new exciting challenges. The multilayer network model recognizes that the complexity of relationships between entities in real-world systems is better embraced as several interdependent subsystems (or layers) rather than a simple graph approach. Despite only recently being formalized and defined, this model can be applied to problems in the domains of life sciences, sociology, digital humanities, and more. Within the domain of network visualization there already are many existing systems, which visualize data sets having many characteristics of multilayer networks, and many techniques, which are applicable to their visualization. In this Synthesis Lecture, we provide an overview and structured analysis of contemporary multilayer network visualization. This is not only for researchers in visualization, but also for those who aim to visualize multilayer networks in the domain of complex systems, as well as those solving problems within application domains. We have explored the visualization literature to survey visualization techniques suitable for multilayer network visualization, as well as tools, tasks, and analytic techniques from within application domains. We also identify the research opportunities and examine outstanding challenges for multilayer network visualization along with potential solutions and future research directions for addressing them.

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