Practical Graph Mining with R (Chapman Hall/CRC Data Mining and Knowledge Discovery Series)

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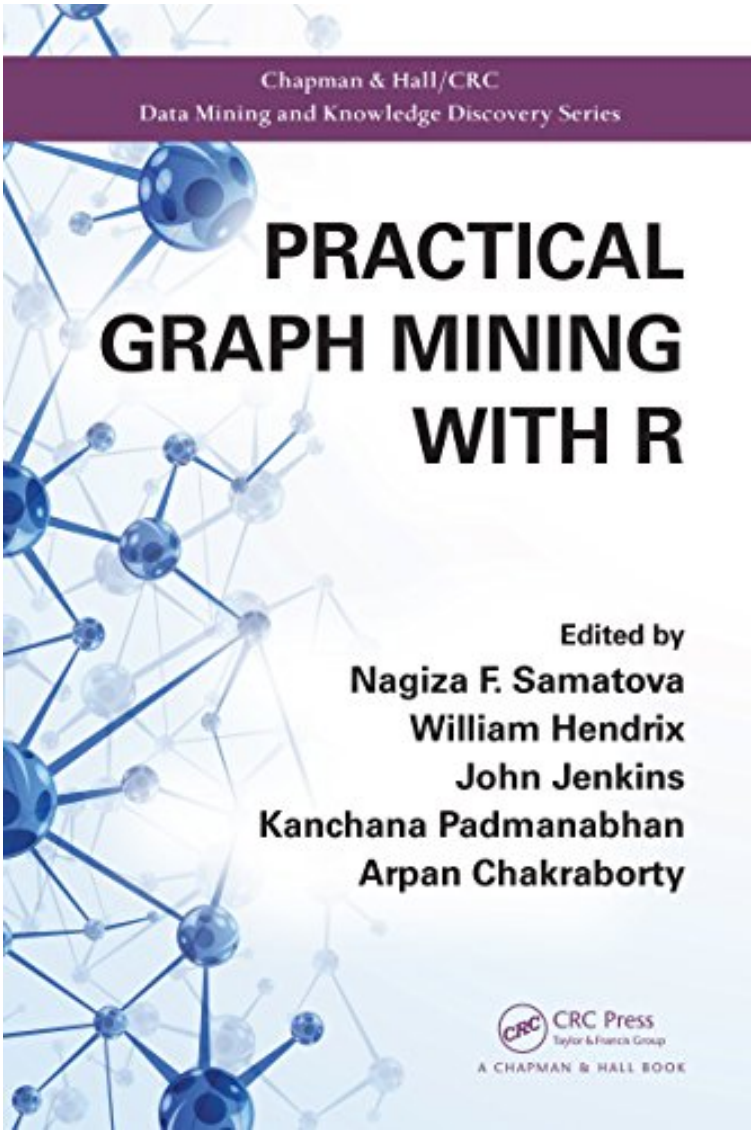

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Discover Novel and Insightful Knowledge from Data Represented as a GraphPractical Graph Mining with R presents a "do-it-yourself" approach to extracting interesting patterns from graph data. It covers many basic and advanced techniques for the identification of anomalous or frequently recurring patterns in a graph, the discovery of groups or clusters of nodes that share common patterns of attributes and relationships, the extraction of patterns that distinguish one category of graphs from another, and the use of those patterns to predict the category of new graphs.Hands-On Application of Graph Data MiningEach chapter in the book focuses on a graph mining task, such as link analysis, cluster analysis, and classification. Through applications using real data sets, the book demonstrates how computational techniques can help solve real-world problems. The applications covered include network intrusion detection, tumor cell diagnostics, face recognition, predictive toxicology, mining metabolic and protein-protein interaction networks, and community detection in social networks.Develops Intuition through Easy-to-Follow Examples and Rigorous Mathematical FoundationsEvery algorithm and example is accompanied with R code. This allows readers to see how the algorithmic techniques correspond to the process of graph data analysis and to use the graph mining techniques in practice. The text also gives a rigorous, formal explanation of the underlying mathematics of each technique.Makes Graph Mining Accessible to Various Levels of ExpertiseAssuming no prior knowledge of mathematics or data mining, this self-contained book is accessible to students, researchers, and practitioners of graph data mining. It is suitable as a primary textbook for graph mining or as a supplement to a standard data mining course. It can also be used as a reference for researchers in computer, information, and computational science as well as a handy guide for data analytics practitioners.

"The authors provide a tour de force introduction to the different data representations (vectors, matrices), and introduce graph structures and the questions that can be answered with them. ... The book has many strong points. There is a companion website that hosts slide presentations for almost all chapters, as well the R code needed to run the example code. The impatient reader can start going through the presentations and experimenting with the code right away. The more patient reader can read the book from cover to cover. For many reader categories, this summary of existing relevant work and approaches for data mining graph structures is a welcome addition, for which the authors deserves much praise."--Radu State, Computing sAbout the AuthorNagiza F. Samatova is an associate professor of computer science at North Carolina State University and a senior research scientist at Oak Ridge National Laboratory.