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Sommario/riassunto

This book is a general introduction to the statistical analysis of networks, and can serve both as a research monograph and as a textbook. Numerous fundamental tools and concepts needed for the analysis of networks are presented, such as network modeling, community detection, graph-based semi-supervised learning and sampling in networks. The description of these concepts is self-contained, with both theoretical justifications and applications provided for the presented algorithms.

Researchers, including postgraduate students, working in the area of network science, complex network analysis, or social network analysis, will find up-to-date statistical methods relevant to their research tasks. This book can also serve as textbook material for courses related to the statistical approach to the analysis of complex networks.

In general, the chapters are fairly independent and self-supporting, and the book could be used for course composition “à la carte”. Nevertheless, Chapter 2 is needed to a certain degree for all parts of the book. It is also recommended to read Chapter 4 before reading Chapters 5 and 6, but this is not absolutely necessary. Reading Chapter 3 can also be helpful before reading Chapters 5 and 7.

As prerequisites for reading this book, a basic knowledge in probability, linear algebra and elementary notions of graph theory is advised. Appendices describing required notions from the above mentioned disciplines have been added to help readers gain further understanding.