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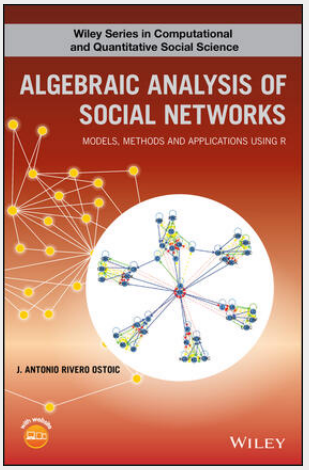
Algebraic Analysis of Social Networks

Models, Methods and Applications Using R



Presented in a comprehensive manner, this book provides a comprehensive foundation in algebraic approaches for the analysis of different types of social networks such as multiple, signed, and affiliation networks. The study of such configurations corresponds to the structural analysis within the social sciences, and the methods applied for the analysis are in the areas of abstract algebra, combinatorics, and graph theory. Current research in social networks has moved toward the examination of more realistic but also more complex social relations by which agents or actors are connected in multiple ways. Addressing this trend, this book offers hands-on training of the algebraic procedures presented along with the computer package multiplex, written by the book's author specifically to perform analyses of multiple social networks. An introductory section on both complex networks and for R will feature, however the subjects themselves correspond to advanced courses on social network analysis with the specialization on algebraic models and methods.

ALGEBRAIC ANALYSIS OF SOCIAL NETWORKS Learn to analyze social networks using R with this insightful and comprehensive resource Algebraic Analysis of Social Networks: models, methods & applications using R delivers a comprehensive mixture of theory and practice for performing network analysis with algebra. With a focus on the study of complex systems like multiplex, multimodal, and multilevel networks, the book covers elementary structures with the genesis of algebraic approaches for the analysis of kinship networks from the 1940s. Foundational concepts within structural analysis with algebra form the core of the first part of the book, while more advanced concepts, like positional analysis, role structure and its decomposition, signed networks, and affiliation networks fill out the latter half. The book covers a wide variety of topics, including: * The fundamental concepts of equivalence and ordering, including partial order and hierarchy * Group structure, including Cayley Graphs, permutation groups, and the presentation of group structures * Relational structure with relational composition, along with kinship networks and the Strength of Weak Ties model * Positional analysis with compositional equivalence, including Cumulated Person Hierarchy * The factorization of role structures with Congruence lattices * Formal concept analysis of affiliation networks Algebraic Analysis of Social Networks combines elementary and fundamental concepts necessary to fully understand this field with an insightful and comprehensive treatment of more advanced ideas to round out the reader's understanding. Throughout the book, practical and functional R code supplement the provided theory and allow the reader to implement the ideas found within.

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