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Sommario/riassunto	This monograph deals with mathematical constructions that are foundational in such an important area of data mining as pattern recognition. By using combinatorial and graph theoretic techniques, a closer look is taken at infeasible systems of linear inequalities, whose generalized solutions act as building blocks of geometric decision rules for pattern recognition. Infeasible systems of linear inequalities prove to be a key object in pattern recognition problems described in geometric terms thanks to the committee method. Such infeasible systems of inequalities represent an important special subclass of infeasible systems of constraints with a monotonicity property - systems whose multi-indices of feasible subsystems form abstract simplicial complexes (independence systems), which are fundamental objects of

combinatorial topology. The methods of data mining and machine learning discussed in this monograph form the foundation of technologies like big data and deep learning, which play a growing role in many areas of human-technology interaction and help to find solutions, better solutions and excellent solutions. Contents:

Preface
Pattern recognition, infeasible systems of linear inequalities, and graphs
Infeasible monotone systems of constraints
Complexes, (hyper) graphs, and inequality systems
Polytopes, positive bases, and inequality systems
Monotone Boolean functions, complexes, graphs, and inequality systems
Inequality systems, committees, (hyper)graphs, and alternative covers
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