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Titolo	Graph theory and applications with exercises and problems / / Jean-Claude Fournier
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Graph Theory and Applications with Exercises and Problems; Table of Contents; Introduction; Chapter 1. Basic Concepts; 1.1 The origin of the graph concept; 1.2 Definition of graphs; 1.2.1 Notation; 1.2.2 Representation; 1.2.3 Terminology; 1.2.4 Isomorphism and unlabeled graphs; 1.2.5 Planar graphs; 1.2.6 Complete graphs; 1.3 Subgraphs; 1.3.1 Customary notation; 1.4 Paths and cycles; 1.4.1 Paths; 1.4.2 Cycles; 1.4.3 Paths and cycles as graphs; 1.5 Degrees; 1.5.1 Regular graphs; 1.6 Connectedness; 1.7 Bipartite graphs; 1.7.1 Characterization; 1.8 Algorithmic aspects 1.8.1 Representations of graphs inside amachine1.8.2 Weighted graphs; 1.9 Exercises; Chapter 2. Trees; 2.1 Definitions and properties; 2.1.1 First properties of trees; 2.1.2 Forests; 2.1.3 Bridges; 2.1.4 Tree characterizations; 2.2 Spanning trees; 2.2.1 An interesting illustration of trees; 2.2.2 Spanning trees in a weighted graph; 2.3 Application: minimum spanning tree problem; 2.3.1 The problem; 2.3.2 Kruskal's

algorithm; 2.3.3 Justification; 2.3.4 Implementation; 2.3.5 Complexity; 2.4 Connectivity; 2.4.1 Block decomposition; 2.4.2 k-connectivity; 2.4.3 k-connected graphs
2.4.4 Menger's theorem2.4.5 Edge connectivity; 2.4.6 k-edge-connected graphs; 2.4.7 Application to networks; 2.4.8 Hypercube; 2.5 Exercises; Chapter 3. Colorings; 3.1 Coloring problems; 3.2 Edge coloring; 3.2.1 Basic results; 3.3 Algorithmic aspects; 3.4 The timetabling problem; 3.4.1 Roomconstraints; 3.4.2 An example; 3.4.3 Conclusion; 3.5 Exercises; Chapter 4. Directed Graphs; 4.1 Definitions and basic concepts; 4.1.1 Notation; 4.1.2 Terminology; 4.1.3 Representation; 4.1.4 Underlying graph; 4.1.5 "Directed" concepts; 4.1.6 Indegrees and outdegrees; 4.1.7 Strongly connected components
4.1.8 Representations of digraphs inside a machine4.2 Acyclic digraphs; 4.2.1 Acyclic numbering; 4.2.2 Characterization; 4.2.3 Practical aspects; 4.3 Arborescences; 4.3.1 Drawings; 4.3.2 Terminology; 4.3.3 Characterization of arborescences; 4.3.4 Subarborescences; 4.3.5 Ordered arborescences; 4.3.6 Directed forests; 4.4 Exercises; Chapter 5. Search Algorithms; 5.1 Depth-first search of an arborescence; 5.1.1 Iterative form; 5.1.2 Visits to the vertices; 5.1.3 Justification; 5.1.4 Complexity; 5.2 Optimization of a sequence of decisions; 5.2.1 The eight queens problem
5.2.2 Application to game theory:finding a winning strategy5.2.3 Associated arborescence; 5.2.4 Example; 5.2.5 The minimax algorithm; 5.2.6 Implementation; 5.2.7 In concrete terms; 5.2.8 Pruning; 5.3 Depth-first search of a digraph; 5.3.1 Comments; 5.3.2 Justification; 5.3.3 Complexity; 5.3.4 Extended depth-first search; 5.3.5 Justification; 5.3.6 Complexity; 5.3.7 Application to acyclic numbering; 5.3.8 Acyclic numbering algorithms; 5.3.9 Practical implementation; 5.4 Exercises; Chapter 6. Optimal Paths; 6.1 Distances and shortest paths problems; 6.1.1 A few definitions
6.1.2 Types of problems

Sommario/riassunto

This book provides a pedagogical and comprehensive introduction to graph theory and its applications. It contains all the standard basic material and develops significant topics and applications, such as: colorings and the timetabling problem, matchings and the optimal assignment problem, and Hamiltonian cycles and the traveling salesman problem, to name but a few. Exercises at various levels are given at the end of each chapter, and a final chapter presents a few general problems with hints for solutions, thus providing the reader with the opportunity to test and refine their knowledge on the

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Nota di contenuto	Chapter1: Structure/Property Behavior of Additively Manufactured (AM) Materials: Opportunities & Challenges -- Chapter2: Fatigue Characterization of 3D-printed Maraging Steel by Infrared Thermography -- Chapter3: Quasi-Static and Dynamic Fracture of Additively Printed ABS Studied using DIC: Role of Build Architecture and Loading Rate -- Chapter4: Compression and Shear Response of 3D Printed Foam Pads -- Chapter5: Mechanical Structure-Property Relationships for 2D Polymers Comprised of Nodes and Bridge Units -- Chapter6: Mechanical Behavior of Additively Manufactured Ti-6Al-4V Following a New Heat Treatment -- Chapter7: Dynamic Thermal Softening Behavior of Additive Materials for Hybrid Manufacturing -- Chapter8: Correlation between Process Parameters and Mechanical Properties in Parts Printed By the Fused Deposition Modeling Process --

Chapter9: Mechanical Characterization of Cellulose Nanofibril Materials made by Additive Manufacturing -- Chapter10: Shock Propagation and Deformation of Additively-Manufactured Polymer Foams with Engineered Porosity -- Chapter11: Mechanical Characterization of Fused Filament Fabrication Polyvinylidene Fluoride Printed (PVDF) Composites -- Chapter12: Influence of an Extreme Environment on the Tensile Mechanical Properties of a 3D Printed Thermoplastic Polymer -- Chapter13: A Framework for Estimating of Mold Performance Using Experimental and Numerical Analysis of Injection Mold Tooling Prototypes -- Chapter14: Effect of Processing Parameters on Interlayer Fracture Toughness of Fused Filament Fabrication Thermoplastic Materials -- Chapter15: Forced-Response Verification of Unique Additive Manufactured Vibration Suppressed Specimens -- Chapter16: Computational and Experimental Characterization of 3D Printed Components by Fused Deposition Modeling -- Chapter17: Linking Thermal History to Mechanical Behavior in Directed Energy Deposited Materials. .

Sommario/riassunto

Mechanics of Additive and Advanced Manufacturing, Volume 8 of the Proceedings of the 2018 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, the eighth volume of eight from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies, including: Fatigue & Fracture in AM Materials Additively Manufactured Metals & Structures AM Process Characterization Processing & Mechanical Behavior of AM Materials Dynamic Response of AM Materials Additively Manufactured Polymers & Composites.