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	Descrizione fisica	1 online resource (XXXI, 441 p. 92 illus., 1 illus. in color.)
	Disciplina	512.5
	Soggetti	Matrix theory Algebra Computer science—Mathematics Computer mathematics Group theory Linear and Multilinear Algebras, Matrix Theory Mathematical Applications in Computer Science Group Theory and Generalizations
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Part I Introduction to Linear Algebra -- Vectors and Matrices -- Vector Product in Geometrical Mechanics -- Markov Chain in a Graph -- Special Relativity - Algebraic Point of View -- Part II Introduction to Group Theory -- Group Representation and Isomorphism Theorems -- Projective Geometry in Computer Graphics -- Quantum Mechanics - Algebraic Point of View -- Part III Polynomials and Basis Functions -- Polynomials and their Gradient -- Basis Functions: Barycentric Coordinates in 3-D -- Part IV Finite Elements in 3-D -- Automatic Mesh Generation -- Mesh Regularity -- Numerical Integration -- Spline: Variational Model -- Part V Advanced Applications in Physics and Chemistry -- Quantum Chemistry: Electronic Structure -- General Relativity: Einstein Equations -- References.
	Sommario/riassunto	This textbook demonstrates the strong interconnections between linear algebra and group theory by presenting them simultaneously, a pedagogical strategy ideal for an interdisciplinary audience. Being

approached together at the same time, these two topics complete one another, allowing students to attain a deeper understanding of both subjects. The opening chapters introduce linear algebra with applications to mechanics and statistics, followed by group theory with applications to projective geometry. Then, high-order finite elements are presented to design a regular mesh and assemble the stiffness and mass matrices in advanced applications in quantum chemistry and general relativity. This text is ideal for undergraduates majoring in engineering, physics, chemistry, computer science, or applied mathematics. It is mostly self-contained—readers should only be familiar with elementary calculus. There are numerous exercises, with hints or full solutions provided. A series of roadmaps are also provided to help instructors choose the optimal teaching approach for their discipline.