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Sinopsis

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Provides a mathematical introduction to linear and non-linear (i.e. algebraic) computational geometry
Applies the theory to computer graphics, curve reconstruction and robotics
Establishes interconnections with other disciplines such as algebraic geometry, optimization and numerical mathematics
Polyhedral and Algebraic Methods in Computational Geometry provides a thorough introduction into algorithmic geometry and its applications. It presents its primary topics from the viewpoints of discrete, convex and elementary algebraic geometry.

The first part of the book studies classical problems and techniques that refer to polyhedral structures. The authors include a study on algorithms for computing convex hulls as well as the construction of Voronoi diagrams and Delone triangulations.

The second part of the book develops the primary concepts of (non-linear) computational algebraic geometry. Here, the book looks at Gröbner bases and solving systems of polynomial equations. The theory is illustrated by applications in computer graphics, curve reconstruction and robotics.

Throughout the book, interconnections between computational geometry and other disciplines (such as algebraic geometry, optimization and numerical mathematics) are established.

Polyhedral and Algebraic Methods in Computational Geometry is directed towards advanced undergraduates in mathematics and computer science, as well as towards engineering students who are interested in the applications of computational geometry.
Content Level » Graduate

Keywords » Computational Geometry - Convex Hull - Polyhedron - Polytope - Voronoi diagram

Related subjects » Computational Science & Engineering - Geometry & Topology - Theoretical Computer Science