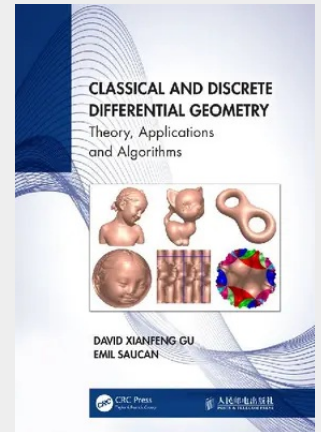


Classical and Discrete Differential Geometry

Theory, Applications and Algorithms

This book introduces differential geometry and cutting-edge findings from the discipline by incorporating both classical approaches and modern discrete differential geometry across all facets and applications, including graphics and imaging, physics and networks. With curvature as the centerpiece, the authors present the development of differential geometry, from curves to surfaces, thence to higher dimensional manifolds; and from smooth structures to metric spaces, weighted manifolds and complexes, and to images, meshes and networks. The first part of the book is a differential geometric study of curves and surfaces in the Euclidean space, enhanced while the second part deals with higher dimensional manifolds centering on curvature by exploring the various ways of extending it to higher dimensional objects and more general structures and how to return to lower dimensional constructs. The third part focuses on computational algorithms in algebraic topology and conformal geometry, applicable for surface parameterization, shape registration and structured mesh generation. The volume will be a useful reference for students of mathematics and computer science, as well as researchers and engineering professionals who are interested in graphics and imaging, complex networks, differential geometry and curvature.

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