Guide to computational geometry processing: foundations, algorithms, and methods

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Deskripsi Lengkap: https://lib.ui.ac.id/detail?id=20407909&lokasi=lokal

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Abstrak

This book reviews the algorithms for processing geometric data, with a practical focus on important techniques not covered by traditional courses on computer vision and computer graphics. Features, presents an overview of the underlying mathematical theory, covering vector spaces, metric space, affine spaces, differential geometry, and finite difference methods for derivatives and differential equations, reviews geometry representations, including polygonal meshes, splines, and subdivision surfaces, examines techniques for computing curvature from polygonal meshes, describes algorithms for mesh smoothing, mesh parametrization, and mesh optimization and simplification, discusses point location databases and convex hulls of point sets, investigates the reconstruction of triangle meshes from point clouds, including methods for registration of point clouds and surface reconstruction, provides additional material at a supplementary website, and includes self-study exercises throughout the text.