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By Tamal K. Dey



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Many applications in science and engineering require a digital model of a real physical object. Advanced scanning technology has made it possible to scan such objects and generate point samples on their boundaries. This book, first published in 2007, shows how to compute a digital model from this point sample. After developing the basics of sampling theory and its connections to various geometric and topological properties, the author describes a suite of algorithms that have been designed for the reconstruction problem, including algorithms for surface reconstruction from dense samples, from samples that are not adequately dense and from noisy samples. Voronoi- and Delaunay-based techniques, implicit surface-based methods and Morse theory-based methods are covered. Scientists and engineers working in drug design, medical imaging, CAD, GIS, and many other areas will benefit from this first book on the subject.

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#### **Editorial Review**

#### Review

"The text is well written, and presents the algorithms in a way that makes them quite understandable." Matthew J. Sottile, SIGACT News

#### About the Author

Tamal K. Dey is Professor of Computer Science at the Ohio State University. He received his PhD from Purdue University. Before joining the Ohio State University he held faculty positions at Indian Institute of Technology, Kharagpur and research positions at the University of Illinois and Max Planck Institute. His primary research area is Computational Geometry and Computational Topology with applications to geometric modeling. He has authored more than fifty papers in this area and has lectured extensively on the topic of reconstruction and mesh generation in various academic forums.

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