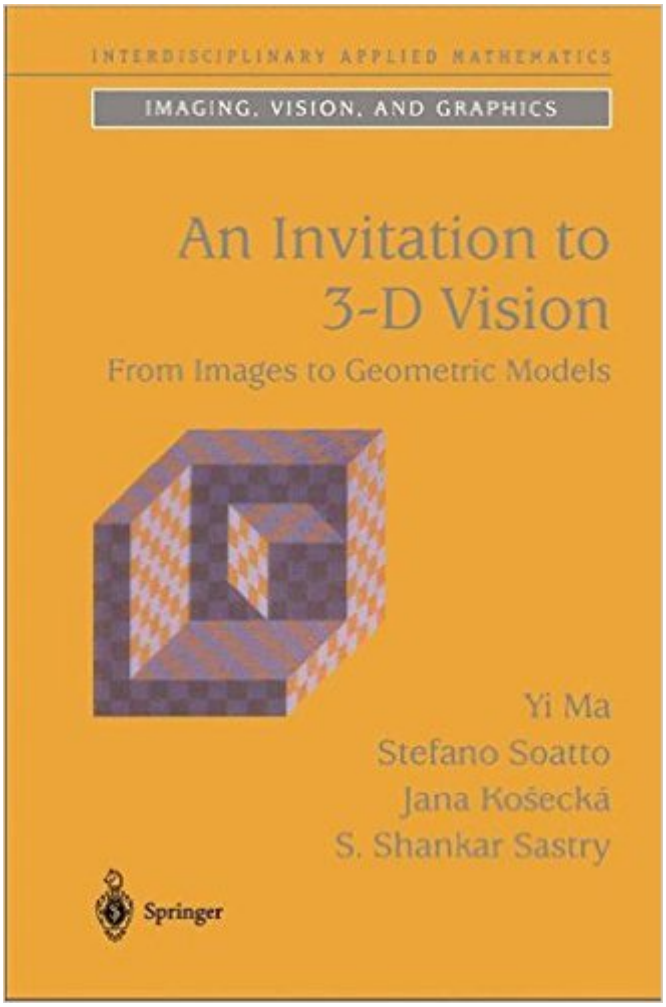
An Invitation To 3-D Vision: From Images To Geometric Models (Interdisciplinary Applied Mathematics)



Synopsis

This book introduces the geometry of 3-D vision, that is, the reconstruction of 3-D models of objects from a collection of 2-D images. It details the classic theory of two view geometry and shows that a more proper tool for studying the geometry of multiple views is the so-called rank consideration of the multiple view matrix. It also develops practical reconstruction algorithms and discusses possible extensions of the theory.

Book Information

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Customer Reviews

I really liked this book. However, I use it for vision issues as they relate to robotics rather than as an introductory text on 3D vision. If a general or introductory textbook on 3D computer vision is what you desire, then you might be better off with "Multiple View Geometry in Computer Vision" by Hartley or my personal favorite, "Introductory Techniques for 3-D Computer Vision" by Trucco and Verri. For individuals studying robotic vision, many parts of this book are useful not only for characterizing vision, but for putting together algorithms and equations that are useful for describing robotic motion in general. For example, chapter two of the book collects equations and algorithms that are very useful in describing forward kinematics. Chapters five through ten cover all of the considerations and algorithms needed to produce a 3D image from a collection of images taken from different viewpoints. Chapter eleven applies this knowledge with sequential instructions on building a 3D image from a group of images. Chapter twelve has a second application that shows

how to perform autonomous control of a moving vehicle via video feedback. The appendices have some very good information on linear algebra as it relates to computer vision as well as details on the Kalman filter, which is also of great interest to those of us who are interested in computational robotics. Algorithms are blocked out and explained in logical steps throughout the book, and it also has very good exercises at the end of each chapter as well as short examples throughout each chapter, although the notation can sometimes be a little confusing.