PART

3-D Vision and Motion

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Part 3 covers the developments needed for an understanding of real scenes, which necessarily contain 3-D objects—a number of which may be in motion. 3-D vision is considerably more complex than 2-D vision, not least because the number of degrees of freedom of an object will typically have increased from three to six, with an accompanying combinatorial increase in the number of scene configurations to be considered.

This part of the book starts (Chapter 15) by airing the problems, before considering the complexities of full perspective projection (Chapter 16). Next, it is useful to see what short cuts can be achieved by taking invariants into account (Chapter 17). Chapter 18 not only deals with camera calibration but also shows how recent research has attempted to avoid the need for explicit calibration by making careful computations that interrelate multiple scenes: here the emphasis is on taking opportunities that permit some of the complexities to be by-passed. Finally, Chapter 19 examines the problems of motion in the context of 3-D vision.