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Nota di contenuto	Visual Perception through Video Imagery; Table of Contents; Introduction; Part 1; Chapter 1. Calibration of Vision Sensors; 1.1. Introduction; 1.2. General formulation of the problem of calibration; 1.2.1. Formulation of the problem; 1.2.1.1. Modeling the camera and lens: pin-hole model; 1.2.1.2. Formation of images: perspective projection; 1.2.1.3. Changing lens/camera reference point; 1.2.1.4. Changing of the camera/image point; 1.2.1.5. Changing of coordinates in the image plane; 1.2.2. General expression; 1.2.2.1. General formulation of the problem of calibration; 1.3. Linear approach 1.3.1. Principle1.3.2. Notes and comments; 1.4. Non-linear photogrammetric approach; 1.4.1. Mathematic model; 1.4.2. Solving the problem; 1.4.3. Multi-image calibration; 1.4.4. Self-calibration by bundle adjustment; 1.4.4.1. Redefinition of the problem; 1.4.4.2. Estimation of redundancy; 1.4.4.3. Solution for a near scale factor;

1.4.4.4. Initial conditions; 1.4.5. Precision calculation; 1.5. Results of experimentation; 1.5.1. Bundle adjustment for a traditional lens; 1.5.1.1. Initial and experimental conditions; 1.5.1.2. Sequence of classic images; 1.5.2. Specific case of fish-eye lenses
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2.8. Acknowledgement2.9. Bibliography; Chapter 3. Specific Displacements for Self-calibration; 3.1. Introduction: interest to resort to specific movements; 3.2. Modeling: parametrization of specific models; 3.2.1. Specific projection models; 3.2.2. Specifications of internal parameters of the camera; 3.2.3. Taking into account specific displacements; 3.2.4. Relation with specific properties in the scene; 3.3. Self-calibration of a camera; 3.3.1. Usage of pure rotations or points at the horizon; 3.3.2. Pure rotation and fixed parameters; 3.3.3. Rotation around a fixed axis
3.4. Perception of depth

Sommario/riassunto

For several decades researchers have tried to construct perception systems based on the registration data from video cameras. This work has produced various tools that have made recent advances possible in this area. Part 1 of this book deals with the problem of the calibration and auto-calibration of video captures. Part 2 is essentially concerned with the estimation of the relative object/capture position when a priori information is introduced (the CAD model of the object). Finally, Part 3 discusses the inference of density information and the shape recognition in images.