

Preface

Classical multiple-view geometry studies the reconstruction of a static scene observed by a rigidly moving camera. However, in many real-world applications the scene may undergo much more complex dynamical changes. For instance, the scene may consist of multiple moving objects (e.g., a traffic scene) or articulated motions (e.g., a walking human) or even non-rigid dynamics (e.g., smoke, fire, waterfall). In addition, some applications may require interaction with the scene through a dynamical system (e.g., vision-guided robot navigation and coordination).

To study the problem of reconstructing *dynamical scenes*, many new algebraic, geometric, statistical, and computational tools have recently emerged in computer vision, computer graphics, image processing, and vision-based control. The goal of the International Workshop on Dynamical Vision (WDV) is to converge different aspects of the research on dynamical vision and to identify common mathematical problems, models, and methods for future research in this emerging and active area.

This book reports 24 contributions presented at the 1st and 2nd International Workshops on Dynamical Vision, WDV05 and WDV06, which were held in conjunction with the 10th International Conference on Computer Vision (ICCV05) and the 9th European Conference on Computer Vision (ECCV06), respectively. These contributions were selected from over 55 submissions through a rigorous double-blind review process by members of the program committee. The book is structured into six parts, each containing three to five contributions on six topics of dynamical vision: (1) motion segmentation and estimation, (2) human motion analysis, tracking and recognition, (3) dynamic textures, (4) motion tracking, (5) rigid and non-rigid motion analysis, and (6) motion filtering and vision-based control.

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WDV'05 and WDV'06

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The Space of Multibody Fundamental Matrices: Rank, Geometry and Projection

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Direct Segmentation of Multiple 2-D Motion Models of Different Types

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View-Invariant Modeling and Recognition of Human Actions Using Grammars

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