

Contents

Active Vision I

- Active object recognition integrating attention and viewpoint control3
S. J. Dickinson, H.I. Christensen, J. Tsotsos, G. Olofsson
- Active 3D object recognition using 3D affine invariants 15
S. Vinther, R. Cipolla
- Grasping the apparent contour 25
M.J. Taylor, A. Blake
- Visual tracking of high DOF articulated structures: An application
to human hand tracking 35
J.M. Rehg, T. Kanade
- Integration and control of reactive visual processes47
J.L. Crowley, J.M. Bedrune, M. Bekker, M. Schneider

Motion and Structure

- Motion estimation on the essential manifold 61
S. Soatto, R. Frezza, P. Perona
- Motion from point matches using affine epipolar geometry 73
L.S. Shapiro, A. Zisserman, M. Brady
- Navigation using affine structure from motion 85
P.A. Beardsley, A. Zisserman, D.W. Murray
- A paraperspective factorization method for shape and motion recovery97
C.J. Poelman, T. Kanade

Active Vision II

- Active camera self-orientation using dynamic image parameters.....111
V. Sundareswaran, P. Bouthemy, F. Chaumette
- Planning the optimal set of views using the max-min principle.....117
J. Maver, A. Leonardis, F. Solina
- On perceptual advantages of eye-head active control.....123
E. Grosso

Matching and Registration

- Improving registration of 3-D medical images using a mechanical
based method.....131
G. Malandain, S. Fernandez-Vidal, J.M. Rocchisani

Non-iterative contextual correspondence matching.....	137
<i>B. Christmas, J. Kittler, M. Petrou</i>	
A registration method for rigid objects without point matching.....	143
<i>Y. Kita</i>	
Non-parametric local transforms for computing visual correspondence.....	151
<i>R. Zabih, J. Woodfill</i>	
Measuring the affine transform using gaussian filters.....	159
<i>R. Manmatha</i>	
Extracting the affine transformation from texture moments	165
<i>J. Sato, R. Cipolla</i>	
Lack-of-fit detection using the run-distribution test.....	173
<i>A.W. Fitzgibbon, R.B. Fisher</i>	
Disparity-space images and large occlusion stereo.....	179
<i>S.S. Intille, A.F. Bobick</i>	
Registration of a curve on a surface using differential properties	187
<i>A. Gourdon, N. Ayache</i>	
Genetic algorithms applied to binocular stereovision.....	193
<i>R. Vaillant, L. Gueguen</i>	

Segmentation and Restoration

Segmentation of echocardiographic images with Markov random fields	201
<i>I.L. Herlin, D. Bereziat, G. Giraudon, C. Nguyen, C. Graffigne</i>	
Unsupervised regions segmentation: Real time control of an upkeep machine of natural spaces.....	207
<i>M. Derras, C. Debain, M. Berducat, P. Bonton, J. Gallice</i>	
Synchronous image restoration	213
<i>L. Younes</i>	
Parameterfree information-preserving surface restoration	218
<i>U. Weidner</i>	

Illumination

Spatially varying illumination: A computational model of converging and diverging sources.....	227
<i>M.S. Langer, S.W. Zucker</i>	

Shading and Colour

Recovery of illuminant and surface colors from images based on the CIE daylight	235
<i>Y. Ohta and Y. Hayashi</i>	

3-D stereo using photometric ratios	247
<i>L.B. Wolff, E. Angelopoulou</i>	
Shape from shading: provably convergent algorithms and uniqueness results	259
<i>P. Dupuis, J. Oliensis</i>	
Seeing beyond Lambert's law	269
<i>M. Oren, S.K. Nayar</i>	
Using 3-dimensional meshes to combine image-based and geometry-based constraints	281
<i>P. Fua, Y.G. Leclerc</i>	

Motion Segmentation

Determination of optical flow and its discontinuities using non-linear diffusion	295
<i>M. Proesmans, L.J. VanGool, E. Pauwels, A. Oosterlinck</i>	
Motion boundary detection in image sequences by local stochastic tests ...	305
<i>H.-H. Nagel, G. Socher, H. Kollnig, M. Otte</i>	
Segmentation of moving objects by robust motion parameter estimation over multiple frames.	316
<i>S. Ayer, P. Schroeter, J. Bigün</i>	
Stochastic motion clustering	328
<i>P.H.S. Torr, D.W. Murray</i>	
Association of motion verbs with vehicle movements extracted from dense optical flow fields	338
<i>H. Kollnig, H.-H. Nagel, M. Otte</i>	

Feature-Extraction

Comparisons of probabilistic and non-probabilistic Hough transforms	351
<i>H. Kälviäinen, P. Hirvonen, L. Xu and E. Oja</i>	
Markov random field models in computer vision	361
<i>S.Z. Li</i>	
The role of key-points in finding contours	371
<i>O. Henricsson, F. Heitger</i>	
A framework for low level feature extraction	383
<i>W. Förstner</i>	

Registration and Reconstruction

Rigid and affine registration of smooth surfaces using differential properties	397
<i>J. Feldmar, N. Ayache</i>	

The quadric reference surface: Applications in registering views of complex 3D objects	407
<i>A. Shashua, S. Toelg</i>	
Relative 3D regularized B-spline surface reconstruction through image sequences	417
<i>C.S. Zhao, R. Mohr</i>	
Intrinsic stabilizers of planar curves	427
<i>H. Delingette</i>	
Geometry and Invariants	
Affine and projective normalization of planar curves and regions	439
<i>K. Åström</i>	
Area and length preserving geometric invariant scale-spaces	449
<i>G. Sapiro, A. Tannenbaum</i>	
Invariants of 6 points from 3 uncalibrated images	459
<i>L. Quan</i>	
A common framework for kinetic depth, reconstruction and motion for deformable objects	471
<i>G. Sparr</i>	
Author Index	483

Contents of Volume I

Geometry and Shape I

Evolutionary fronts for topology-independent shape modeling and recovery	3
<i>R. Malladi, J.A. Sethian, B.C. Vemuri</i>	
Epipolar fields on surfaces	14
<i>P.J. Giblin, R.S. Weiss</i>	
Stability and likelihood of views of three dimensional objects	24
<i>D. Weinshall, M. Werman, N. Tishby</i>	
Topological reconstruction of a smooth manifold-solid from its occluding contour	36
<i>L.R. Williams</i>	

Optical Flow and Motion Fields

Optical flow estimation: advances and comparisons	51
<i>M. Otte, H.-H. Nagel</i>	
Multiple constraints for optical flow	61
<i>M. Tistarelli</i>	
Motion field of curves: applications	71
<i>T. Papadopoulos, O. Faugeras</i>	
Sufficient image structure for 3-D motion and shape estimation	83
<i>S. Carlsson</i>	

Image Features

A comparison between the standard Hough transform and the Mahalanobis distance Hough transform	95
<i>C. Xu, S.A. Velastin</i>	
Junction classification by multiple orientation detection	101
<i>M. Michaelis, G. Sommer</i>	
Following corners on curves and surfaces in the scale space	109
<i>B. Vasselle, G. Giraudon, M. Berthod</i>	
Scale-space properties of quadratic edge detectors	115
<i>P. Kube, P. Perona</i>	

Motion and Flow

A scalar function formulation for optical flow	125
<i>A.A. Amini</i>	

First order optic flow from log-polar sampled images	132
<i>H. Tunley, D. Young</i>	
Recursive non-linear estimation of discontinuous flow fields	138
<i>M.J. Black</i>	
The use of optical flow for the autonomous navigation	146
<i>A. Giachetti, M. Campani, V. Torre</i>	
An image motion estimation technique based on a combined statistical test and spatiotemporal generalised likelihood ratio approach	152
<i>F. Germain, T. Skordas</i>	

Motion Segmentation and Tracking

Independent motion segmentation and collision prediction for road vehicles	161
<i>D. Sinclair, B. Boufama</i>	
An MRF based motion detection algorithm implemented on analog resistive network	167
<i>F. Luthon, G.V. Popescu, A. Caplier</i>	
Occlusion ambiguities in motion	175
<i>D. Geiger, K.J. Diamantaras</i>	
A robust tracking of 3D motion	181
<i>A. Borri, G. Bucci, P. Nesi</i>	
Robust multiple car tracking with occlusion reasoning	189
<i>D. Koller, J. Weber, J. Malik</i>	

Ego-Motion and 3D Recovery

Shape from motion algorithms: a comparative analysis of scaled orthography and perspective	199
<i>B. Boufama, D. Weinshall, M. Werman</i>	
Robust egomotion estimation from affine motion parallax	205
<i>J.M. Lawn, R. Cipolla</i>	
Integrated 3D analysis of flight image sequences	211
<i>S. Sull, N. Ahuja</i>	
Recursive affine structure and motion from image sequences	217
<i>P.F. McLauchlan, I.D. Reid, D.W. Murray</i>	
Shape models from image sequences	225
<i>X. Shen, D. Hogg</i>	
Vibration modes for nonrigid motion analysis in 3D images	231
<i>C. Nastar</i>	

Recognition I

Applying VC-dimension analysis to object recognition	239
<i>M. Lindenbaum, S. Ben-David</i>	
Extraction of groups for recognition	251
<i>P. Havaladar, G. Medioni, F. Stein</i>	
Model based pose estimation of articulated and constrained objects	262
<i>Y. Hel-Or, M. Werman</i>	
Seeing behind occlusions	274
<i>D.H. Ballard, R.P.N. Rao</i>	
Face recognition: the problem of compensating for changes in illumination direction	286
<i>Y. Moses, Y. Adini, S. Ullman</i>	

Shape Modelling

Learning flexible models from image sequences	299
<i>A. Baumberg, D. Hogg</i>	
A direct recovery of superquadric models in range images using recover-and-select paradigm	309
<i>A. Leonardis, F. Solina, A. Macerl</i>	
Segmentation and recovery of SHGCs from a real intensity image	319
<i>M. Zerroug, R. Nevatia</i>	
Recognizing hand gestures	331
<i>J. Davis, M. Shah</i>	
Pose refinement of active models using forces in 3D	341
<i>A.D. Worrall, G.D. Sullivan, K.D. Baker</i>	

Shape Estimation

Recovering surface curvature and orientation from texture distortion: a least squares algorithm and sensitivity analysis	353
<i>J. Malik, R. Rosenholtz</i>	
Direct estimation of local surface shape in a fixating binocular vision system	365
<i>J. Gårding, T. Lindeberg</i>	
Deriving orientation cues from stereo images	377
<i>L. Robert, M. Hebert</i>	
Shape-adapted smoothing in estimation of 3-D depth cues from affine distortions of local 2-D brightness structure	389
<i>T. Lindeberg, J. Gårding</i>	

Geometry and Shape II

Utilizing symmetry in the reconstruction of three-dimensional shape from noisy images	403
<i>H. Zabrodsky, D. Weinshall</i>	
Consistency and correction of line-drawings, obtained by projections of piecewise planar objects	411
<i>A. Heyden</i>	
On the enumerative geometry of aspect graphs	421
<i>S. Petitjean</i>	
Geometry-driven curve evolution	427
<i>P. Fiddelaers, E.J. Pauwels, L.J. Van Gool</i>	
Quantitative measurement of manufactured diamond shape	433
<i>R.J. Hartley, A. Noble, J. Grande, J. Liu</i>	
Hierarchical shape representation using locally adaptive finite elements	441
<i>E. Koh, D. Metaxas, N. Badler</i>	

Calibration and Multiple Views

Camera calibration from spheres images	449
<i>N. Daucher, M. Dhome, J.T. Lapresté</i>	
Self calibration of a stereo head mounted onto a robot arm	455
<i>R. Horaud, F. Dornaika, B. Boufama, R. Mohr</i>	
Analytical methods for uncalibrated stereo and motion reconstruction	463
<i>J. Ponce, D.H. Marimont, T.A. Cass</i>	
Self-calibration from multiple views with a rotating camera	471
<i>R.J. Hartley</i>	
Trilinearity in visual recognition by alignment	479
<i>A. Shashua</i>	
What can two images tell us about a third one?	485
<i>O. Faugeras, L. Robert</i>	

Recognition II

A robust method for road sign detection and recognition	495
<i>G. Piccioli, E. De Micheli, M. Campani</i>	
Pose determination and recognition of vehicles in traffic scenes	501
<i>T.N. Tan, G.D. Sullivan, K.D. Baker</i>	
Performance comparison of ten variations on the interpretation-tree matching algorithm	507
<i>R.B. Fisher</i>	

Recognition of human facial expressions without feature extraction	513
<i>K. Matsuno, C.W. Lee, S. Tsuji</i>	
Pulsed neural networks and perceptive grouping	521
<i>D. Derou, L. Herault</i>	
Projective invariants for planar contour recognition	527
<i>M. Van Diest, L.J. Van Gool, T. Moons, E.J. Pauwels</i>	
Divided we fall: Resolving occlusions using causal reasoning	535
<i>P.R. Cooper, L.A. Birnbaum, D. Halabe, M.Brand, P.N. Prokopowicz</i>	
Stereo and Calibration	
Camera calibration of a head-eye system for active vision	543
<i>M. Li</i>	
Linear pushbroom cameras	555
<i>R.J. Hartley, R. Gupta</i>	
Robust recovery of the epipolar geometry for an uncalibrated stereo rig . . .	567
<i>R. Deriche, Z. Zhang, Q.-T. Luong, O.Faugeras</i>	
A stability analysis of the fundamental matrix	577
<i>Q.-T. Luong, O. Faugeras</i>	
Canonic representations for the geometries of multiple projective views . . .	589
<i>Q.-T. Luong, T. Viéville</i>	
Author Index	601