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Soggetti	Signal processing Image processing Speech processing systems Pattern recognition Optical data processing Earth sciences Software engineering Computer-aided engineering Signal, Image and Speech Processing Pattern Recognition Image Processing and Computer Vision Earth Sciences, general Software Engineering/Programming and Operating Systems Computer-Aided Engineering (CAD, CAE) and Design
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Nota di contenuto	Performance characterization in computer vision -- Low-level computational mono and stereo vision: A Bayesian approach -- Topographic structure of image -- The dual irregular pyramid -- Analytical results on the Quadtree storage-requirements -- From pyramids to quadtrees: Approximation of heterogeneous surfaces by fixing complexity -- Calculation and estimation of sample statistics of

binary images using quadtree data representations -- Temporal speckle reduction for feature extraction in ultrasound images -- Noise effects in statistical subpixel pattern recognition -- Fast iterative reconstruction of band-limited images from non-uniform sampling values -- Anisotropic filtering of MRI data based upon image gradient histogram -- Fast discrete cosine transform approximation for JPEG image compression -- Error diffusion in Block Truncation Coding -- On a bound on signal-to-noise ratio in subband coding of Gaussian image process -- A linear predictor as a regularization function in adaptive image restoration and reconstruction -- Inversion of convolution by small kernels -- A model-based image quantization technique for supervised image recognition -- Brightness-contrast diffusion and the grouping of missing angles -- Rotation invariance in edge detection -- Using eigenvectors of a vector field for deriving a second directional derivative operator for color images -- Crest lines detection in grey level images: Studies of different approaches and proposition of a new one -- Contour — Detection using the shape of the nearest neighbors Set (NN-Set) -- A comparative study of performance for noisy roof edge detection -- A Hough-like prediction/correction approach for ellipse detection -- Fourier parameterization provide uniform bounded Hough Space -- Motion estimation and the Randomized Hough Transform (RHT): New methods with gradient information -- Circle extraction via least squares and the Kalman filter -- A multiresolution shape description algorithm -- Image coding by morphological skeleton transformation -- A non-linear shape abstraction technique -- Minimum-space time-optimal convex hull algorithms (preliminary report) -- Detecting corners of polygonal and polyhedral objects -- A fast algorithm for dominant point detection on chain-coded contours -- Shapes and metrics -- Simplified technique of structure extraction from textural images -- Adaptive pyramid approach to texture segmentation -- Markov random fields with short- and long-range interaction for modelling gray-scale textured images -- Texture recognition by the q-th order fractal analysis -- A proximity measure of line drawings for comparison of chemical compounds -- Jigsaw puzzle solving using approximate string matching and best-first search -- A morphological approach to the generalised 2-stage stock-cutting problem -- Primitive and compound patterns -- A similarity measure between 3-D objects and its parallel computation -- Automated learning of rules using genetic operators -- Symbolic and iconic information combination for satellite imagery interpretation -- Multi-class classification and symbolic cognitive processing with ALISA -- Computing image flow using a coarse-to-fine strategy for spatiotemporal filters -- Visual motion estimation from image contour tracking -- Robust recovery of ego-motion -- A temporal smoothing technique for real-time motion detection -- Combined evaluation of motion and disparity vector fields for stereoscopic sequence coding -- Recovering translational motion parameters from image sequences using Randomized Hough Transform -- Estimating optical flow for large interframe displacements -- Surface discontinuities in range images -- Algorithms for shape from shading, lighting direction and motion -- Separating diffuse and specular component of image irradiance by translating a camera -- Necessary and sufficient conditions for a unique solution of plane motion and structure -- Photometric stereo for non-lambertian surfaces using color information -- Active fixation for junction classification -- Point matching for registration of free-form surfaces -- Temporal precedence in asynchronous visual indexing -- Improved stripe matching for colour encoded structured light -- Fusion of the stereoscopic and temporal

matching results by an algorithm of coherence control and conflicts management -- 3D Model based stereo reconstruction using coupled Markov random fields -- Occlusions and special views within the reconstruction of polyhedral scenes -- Fast shadowing of volume data -- Three dimensional moment invariants under rigid transformation -- Parameterisation of simple geometrical lambertian surfaces using photometric stereo -- Hough transform to extract 3D information from images of different viewpoints -- Fast algorithm for the stereo pair matching with parallel computation -- Dense stereo correspondence using polychromatic block matching -- Planning the next view using the max-min principle -- Cross-correlation with reconstruction: A new approach to pattern matching -- The iterated normalized backprojection method of image reconstruction -- Cone beam reconstruction and fourier transform of distributions -- Character recognition by affine moment invariants -- Ultra fast pattern classification by fuzzy logic -- An object-oriented pen-based recognizer for handprinted characters -- On the method of critical points in character recognition -- Printed text segmentation using distance transform -- Recognition of handwritten layout drawings -- Automatic recognition of scanned technical drawings -- Digital image processing in radiology: An experience of development of technology for computer-aided diagnosis -- Modeling and quantification of protein maps by Gaussian fitting -- Computer analysis of the large intestine contours for the recognition of diseases -- A rule-based approach to hand X-ray image segmentation -- 3-D cerebral vessel reconstruction from angiograms -- Comparison of different approaches to suppress speckles in ultrasonic tomograms -- A test-bed for computer-assisted fusion of multi-modality medical images -- Object-oriented volume segmentation -- Smooth morphological transformation of CT and MR medical data -- Evaluation of plaque formation — Surface reflectance measurement -- Analysis of MR angiography volume data leading to the structural description of the cerebral vessel tree -- The automatic classification of normal and abnormal chromosomes using image analysis -- Real time image processing for fast seam tracking -- An experimental vision tool for real time quality control -- High-tech approaches of computer vision in industry -- An image processing system for material flow control in coal mining industry -- Transparency quantification. Application to composite materials quality controls by image processing -- Control of composite material strucrure by fractal methods -- Model-based adaptive preprocessing of images in automatic visual inspection -- Application of knowledge-based image inspection system for diagnosis of misprints in offsetprinting -- Multiple image matching in an automatic aerotriangulation system -- Digital processing of skylab X-ray images of the solar corona. -- Finding human faces in a picture -- CADI: Computer assisted educational package for digital image processing -- Computer image analysis to locate targets for an agricultural robot -- The application of digital image processing in the evaluation of agricultural experiments -- GCV-Aided linear image regularization for the reconstruction of wave distribution function of magnetospheric VLF/ELF waves -- Crater detection in aero-space imagery using simple nonparametric statistical tests -- Digital retina simulating dynamic behavior of visual perception -- A new heterogeneous and reconfigurable architecture for image analysis -- The analogic single-chip CNN visual supercomputer — a review -- A variant of learning vector quantizer based on split-merge statistical tests -- Neural networks classifiers based on geocoded data and multispectral images for satellite image interpretation -- Artificial

neural networks for image improvement -- Using Cellular Neural Network to “See” random-dot stereograms.

Sommario/riassunto

This volume constitutes the proceedings of the 5th International Conference on Computer Analysis of Images and Patterns (CAIP'93), held in Budapest, Hungary, in September 1993. Formerly, the events in this biennial conference series were thought as a forum where East European researchers and professionals from academia and industry had an opportunity to discuss their results and ideas with Western colleagues active in image processing and pattern recognition. Now, CAIP'93 has a much more international scope, and in the future these conferences will not any longertake place only in East European countries, but roam throughout whole Europe. Besides invited talks by Belikova, Gimel'farb, Haralick and Roska, the volume contains 114 contributions, either presented as lectures or posters and carefully selected by a highly competent international program committee from a total of some 230 submissions; thus the book gives a thorough survey on recent research results and their applications in image processing and pattern recognition. The proceedings is organized in 20 sections, for example on image data structures, image processing, edges and contours, Hough transforms and related methods, shape, motion, 3-D vision, character recognition and document processing, biomedical applications, industrial applications, and neural networks.