

Proceedings of the

**12th IAPR**

**International Conference on  
Pattern Recognition**

October 9–13, 1994

Jerusalem, Israel

**Volume II**

**Conference B:**

**Pattern Recognition and Neural Networks**

*Sponsored by*

The International Association for Pattern Recognition (IAPR)

*In cooperation with*

The IEEE Computer Society

The Information Processing Association of Israel



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Proceedings of the

# 12th IAPR International Conference on Pattern Recognition

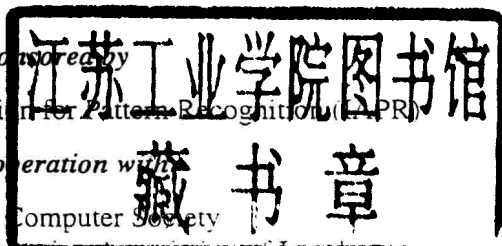
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## **A Message from the Organizers of the ICPR**

We are pleased to welcome you to the 12th International Conference on Pattern Recognition, held this year at the Renaissance Hotel in the city of Jerusalem, Israel, October 9-13, 1994.

The conference program contains 215 podium presentations and 234 posters, organized into four tracks:

COMPUTER VISION AND IMAGE PROCESSING  
PATTERN RECOGNITION AND NEURAL NETWORKS  
SIGNAL PROCESSING  
PARALLEL COMPUTING

The program committees, chairmen, and reviewers spent many hours towards achieving a high-quality and balanced technical program. Their efforts combined with the inspiring location in Jerusalem makes us certain that the 12th ICPR will be a rewarding and memorable experience.

Shmuel Peleg  
*General Co-Chair*  
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Shimon Ullman  
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## A Message from the President of the IAPR

Welcome to the 12th International Conference on Pattern Recognition. It is a pleasure for me to greet the many participants from around the world who have gathered in Jerusalem to share their scientific knowledge, renew old friendships and meet new colleagues.

It seems appropriate at this time to look back over the years at the history of our organization. IAPR had its beginnings at the time of the First International Conference on Pattern Recognition in February 1972 in Washington, D.C. (USA). The goal of creating the association was complete with the first meeting of the IAPR Governing Board in November 1978 (ICPR 4). At that time, the original membership consisted of professional societies from 13 nations, as well as four individual memberships. Over the years we have grown to an association of professional societies from 32 countries. Our first Governing Board had 19 representatives; the current Board, with the addition of our newest members, has 46. Since the last ICPR we have added Belarus, Hong Kong, Slovenia, Taiwan, Ukraine, and most recently, South Africa, to IAPR membership. I am delighted to welcome our new members to participate in ICPR and IAPR.

As IAPR President, I am very gratified that one of my duties during this conference is to announce the first group of IAPR Fellows. The IAPR Fellow Committee has worked diligently over the past two years to establish this program to honor the individuals who have contributed to IAPR and to the field of pattern recognition, and it is exciting for me to share in the fruition of their efforts.

Another accomplishment during the past several years of which I am very proud is the establishment of an Industrial Affiliates Program, which is designed to allow industries in member countries to formally participate in IAPR. We hope this program will lead to increased collaboration and dissemination of pattern recognition research between industry and academic researchers. Several other programs, including the creation of new technical committees, will be introduced soon. These are designed to foster goodwill and encourage dissemination of information and cross-fertilization of ideas; the primary objectives of IAPR.

On this occasion, I would like to express my appreciation to Professor S. Ullman and Professor S. Peleg, General Co-Chairs of ICPR 12, as well as to Prof. Y. Yeshurun, Local Arrangements Chair, and Dr. M. Ejiri, Industrial & Applications Liaison, and the four Program Chairmen. Professors T. Huang, N. Tishby, D. Malah and S. Tanimoto, and the members of the program committees. The tasks involved in organizing and producing ICPR are daunting, and these individuals and their staffs and associates deserve our praise and gratitude for their achievement in putting together the exciting program that has been prepared for us.

Finally, I would like to thank the members of the Executive Committee, the Governing Board, the committee chairmen, and the many committee members who have served with me over the past two years. I believe this period has been extremely productive for IAPR. Several things of which we are most proud, in addition to the programs mentioned above, are the improved content and distribution of our IAPR Newsletter and the establishment of a closer working relationship with the Governing Board members. I greatly appreciate your cooperation, hard work, and enthusiasm over the past two years.

J. K. Aggarwal  
*The University of Texas at Austin*  
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# Table of Contents — ICPR Conference B

Message from the Organizers of ICPR.....	xv
Organizing Committee .....	xvi
Message from the President of IAPR .....	xvii
Members of the Governing Board.....	xviii
IAPR Committees.....	xix
IAPR Member Societies.....	xxi
Conference B: Program Committee Members/Reviewers.....	xxv

## Pattern Recognition & Neural Networks

### Session B1: Statistics and Information Theory

B1.1	Asymptotic Predictions of the Finite-Sample Risk of the $k$ -Nearest-Neighbor Classifier .....	1
	<i>R.R. Snapp and S.S. Venkatesh</i>	
B1.2	A Bayesian Framework for Hierarchical Relaxation .....	7
	<i>E.R. Hancock and R.C. Wilson</i>	
B1.3	Generalization of Linear Patterns Based on MDL Based Criterion.....	13
	<i>H.-P. Pan and W. Forstner</i>	
B1.4	Solomonoff Coding as a Means of Introducing Prior Information in Syntactic Pattern Recognition .....	14
	<i>A.L.N. Fred and J.M.N. Leitão</i>	

### Session B2: Online Handwriting

B2.1	Reliable On-Line Human Signature Verification System for Point-of-Sales Applications .....	19
	<i>L.L. Lee and T. Berger</i>	
B2.2	On-Line Cursive Script Recognition: A System that Adapts to an Unknown User.....	24
	<i>L. Duneau and B. Dorizzi</i>	
B2.3	UNIPEN Project of On-Line Data Exchange and Recognizer Benchmarks .....	29
	<i>I. Guyon, L. Schomaker, R. Plamondon, M. Liberman, and S. Janet</i>	
B2.4	A Statistical Parametric Model for Recognition and Synthesis of Handwriting.....	34
	<i>O. Stettiner and D. Chazan</i>	

### Session B3: Face Recognition

B3.1	Facial Feature Extraction from Color Images .....	39
	<i>T.C. Chang, T.S. Huang, and C. Novak</i>	
B3.2	Recognizing Human Facial Expressions in a Potential Field.....	44
	<i>K. Matsuno and S. Tsuji</i>	

B3.3	Face Recognition Using a Hybrid Supervised/Unsupervised Neural Network .....	50
	<i>N. Intrator, D. Reissfeld, and Y. Yeshurun</i>	
B3.4	Locating Facial Features Using SOFM .....	55
	<i>B. Takacs and H. Wechsler</i>	

#### Session B4: Features and Morphology

B4.1	Feature Selection Based on Divergence for Empirical Class Densities .....	61
	<i>J. Novovicova, P. Pudil, and J. Kittler</i>	
B4.2	Finite Random Sets and Morphology .....	62
	<i>R.M. Haralick, S. Chen, and X. Zhuang</i>	
B4.3	Discriminant Plots Obtained via Removal of Classification Structures .....	67
	<i>M. Aladjem</i>	
B4.4	Nonparametric Classification Using Radial Basis Function Nets and Empirical Risk Minimization .....	72
	<i>A. Krzyzak, T. Linder, and G. Lugosi</i>	

#### Session B5: Handwriting Analysis and Recognition I

B5.1	Comparison of Classifier Methods: A Case Study in Handwritten Digit Recognition .....	77
	<i>L. Bottou, C. Cortes, J.S. Denker, H. Drucker, I. Guyon, L.D. Jackel, Y. Le Cun, U.A. Müller, E. Säckinger, P. Simard, and V. Vapnik</i>	
B5.2	A Genetic Learning System for On-Line Character Recognition .....	83
	<i>B. Bontempi and A. Marcelli</i>	
B5.3	Word-Level Training of a Handwritten Word Recognizer Based on Convolutional Neural Networks .....	88
	<i>Y. LeCun and Y. Bengio</i>	
B5.4	Machine vs Humans in a Cursive Script Reading Experiment without Linguistic Knowledge .....	93
	<i>M. Parizeau and R. Plamondon</i>	

#### Session B6: Neural Network Models and Analysis

B6.1	The Effective Capacity of Multilayer Feedforward Network Classifiers .....	99
	<i>M.A. Kraaijeveld and R.P.W. Duin</i>	
B6.2	The Converging Unlearning Algorithm for the Hopfield Neural Network: Optimal Strategy .....	104
	<i>A. Yu Plakhov</i>	
B6.3	Neural Networks for the Texture Classification of Temporally Consistent Segmented Regions of FLIR Sequences .....	107
	<i>J.F. Haddon and J.F. Boyce</i>	
B6.4	Using Hopfield Networks in the Nominal Color Coding of Classified Images .....	112
	<i>P. Campadelli, P. Mora, and R. Schettini</i>	

#### Session B7: Handwriting Analysis and Recognition II

B7.1	Handwritten Sentence Recognition: From Signal to Syntax .....	117
	<i>R. Plamondon, S. Clergeau, and C. Barriere</i>	

B7.2	Classification of Handwritten Vector Symbols Using Elliptic Fourier Descriptors.....	123
	<i>T. Taxt and K.W. Bjerde</i>	
B7.3	A System for the Off-Line Recognition of Handwritten Text .....	129
	<i>T.M. Breuel</i>	
B7.4	Writer Adaptation for Handwritten Word Recognition Using Hidden Markov Models .....	135
	<i>M. Gilloux</i>	

**Session B8: Biological Applications**

B8.1	Hidden Markov Models for Labeled Sequences .....	140
	<i>A. Krogh</i>	
B8.2	Docking of Protein Molecules.....	145
	<i>D. Fischer, S.L. Lin, R. Nussinov, and H. Wolfson</i>	
B8.3	Cortical Hypercolumns and the Topology of Random Orientation Maps .....	150
	<i>E.L. Schwartz and A.S. Rojer</i>	
B8.4	Generalized Stochastic Tube Model: Tracking 3D Blood Vessels in MR Images.....	156
	<i>Q. Huang and G.C. Stockman</i>	

**Session B9: Panel on Pattern Recognition & Neural Networks**

**Session B10: Pattern Recognition in Vision**

B10.1	Partial Surface and Volume Matching in Three Dimensions .....	161
	<i>G. Barequet and M. Sharir</i>	
B10.2	Rotation Invariant Texture Recognition Using a Steerable Pyramid.....	162
	<i>H. Greenspan, S. Belongie, R. Goodman, and P. Perona</i>	
B10.3	Pattern Recognition by Local Radial Moments.....	168
	<i>R. Desai and H.D. Cheng</i>	
B10.4	Boundary Detection Using Multiscale Markov Random Fields .....	173
	<i>B. Günsel, E. Panayirci, and A.K. Jain</i>	

**Session B11: Methods and Applications**

B11.1	Estimating the Intrinsic Difficulty of a Recognition Problem .....	178
	<i>T.K. Ho and H.S. Baird</i>	
B11.2	Periodicity, Directionality, and Randomness: Wold Features for Perceptual Pattern Recognition .....	184
	<i>F. Liu and R.W. Picard</i>	
B11.3	Finding Arrows in Utility Maps Using a Neural Network .....	190
	<i>J.E. den Hartog and T.K. ten Kate</i>	
B11.4	Restoration and Enhancement of Fingerprint Images Using $M$ -Lattice — A Novel Non-Linear Dynamical System .....	195
	<i>A. Sherstinsky and R.W. Picard</i>	



## Session B12: Theory III: Statistical Mechanics and Related Methods

B12.1	Nonlinear Relaxation Labeling as Growth Transformation .....	201
	<i>M. Pelillo</i>	
B12.2	A Maximum Entropy Approach to Pairwise Data Clustering .....	207
	<i>J.M. Buhmann and T. Hofmann</i>	
B12.3	Noise Sensitivity Signatures for Model Selection.....	213
	<i>T. Grossman and A. Lapedes</i>	
B12.4	MFT Based Discrete Relaxation for Matching High Order Relational Structures .....	219
	<i>D. Yang and J. Kittler</i>	

## Session B13: Theory IV: Algorithms I

B13.1	Learning Rate Schedules for Self-Organizing Maps .....	224
	<i>F. Mulier and V. Cherkassky</i>	
B13.2	Deriving Stopping Rules for the Probabilistic Hough Transform by Sequential Analysis .....	229
	<i>D. Shaked, O. Yaron, and N. Kiryati</i>	
B13.3	A Branch-and-Bound Alogrithm for Optimization of Multiperspective Classifier .....	235
	<i>M.W. Kurzynski, E. Puchala, and A. Blinowska</i>	
B13.4	Lossless Acceleration for Correlation-Based Nearest-Neighbor Pattern Recognition.....	240
	<i>H. Avi-Itzhak and T. Diep</i>	

## Session B14: Fuzzy and Hierarchical Models

B14.1	Knowledge Based (Re-)Clustering .....	245
	<i>M.C. Clark, L.O. Hall, C. Li, and D.B. Goldgof</i>	
B14.2	Detection of Elliptic Shells Using Fuzzy Clustering: Application to MRI Images .....	251
	<i>I. Gath and D. Hoory</i>	
B14.3	A Hierarchical Model-Guided Generation of Chinese Characters .....	256
	<i>H.-J. Lee and H.-C. Hsu</i>	
B14.4	A New Approach to Fuzzy Dynamics .....	261
	<i>Y. Friedman and U. Sandler</i>	

## Session B15: Optical Character Recognition

B15.1	Memory-Based Character Recognition Using a Transformation Invariant Metric .....	262
	<i>P.Y. Simard, Y. Le Cun, and J.S. Denker</i>	
B15.2	A Study for High Precision Character Recognition of Character with Complex Strocks.....	268
	<i>S.M. Kang, H.G. Kim, W.S. Rho, and D.-J. Kim</i>	
B15.3	OCR in Bangla: An Indo-Bangladeshi Language.....	269
	<i>U. Pal and B.B. Chaudhuri</i>	