



**IAPR NEWSLETTER**  
**Vol. 2 No.1 February 1979**

## PRESIDENT'S CORNER

It is with a good deal of soul-searching that I have accepted the presidency of IAPR for the next two years. It is a responsibility one cannot take lightly, and, of course, it will also involve a lot of work. I deeply appreciate the trust expressed by the IAPR Governing Board in electing me. King-Sun Fu's achievements in welding the international pattern recognition community into a cohesive organization, first as chairman of the Standing Committee and later as first officer of IAPR, speak for themselves. We all owe him much for this, and I hope that he will continue to provide his help and counsel in the future.

Within a little over a year, IAPR has grown into an association of 13 national societies. This number may well double by the time of the next international conference in 1980. We are now looking forward to regular quarterly publication of our newsletter and to make the newsletter a valued medium of information exchange in the pattern recognition field. We shall, of course, need your help in this; the newsletter editor can only do a good job if you bring all pertinent news items to his attention.

Those of us who were in Kyoto for the 4th International Conference on Pattern Recognition came away from it with a feeling that pattern recognition has now without doubt become a major scientific/engineering discipline. The conference was the biggest and best ever. The quality of the presented papers, the diversity of the applications discussed, the number of attendees, and the level and excitement of the innumerable corridor and lobby discussions were impressive. A special vote of thanks is due the organizers for creating such a successful conference.

In spite of the high costs of current-day travel, a good many people from all over the globe managed to get to Kyoto and interact with their colleagues. Now we look forward to 1980 in Miami Beach. The organizing committee there will face a real challenge in trying to improve on the Kyoto Conference.

IAPR is still a young association. We need your help in improving its organization, formulating our long-range plans and meeting our objectives. Your officers welcome any suggestions you may have.

Herbert Freeman

### THE FOURTH INTERNATIONAL JOINT CONFERENCE ON PATTERN RECOGNITION

-- A REPORT FROM A PARTICIPANT --

I attended the 4th IJCPR held on November 7-10, 1978 in Kyoto, Japan. The conference was very well organized. In fact, I think, it was one of the best organized conferences I have ever attended. The following are some of the highlights:

- (1) The topics of the 16 invited survey papers were well chosen and covered most areas in pattern recognition; giving historical backgrounds and recent trends.
- (2) Papers in the application-oriented sessions (character recognition, remote sensing, bio-medical application, industrial application, and image sequence analysis) show that the application areas are maturing and expanding.
- (3) Two sessions on special hardwares and systems show that parallel processing, LSI technology, and microprogramming can now provide very high processing power for pattern recognition.
- (4) Four panels discussed future trends: image understanding; software engineering aspects in picture processing; unification of computer graphics and picture processing, and future directions of industrial applications. Also, more precise and systematic approaches, rather than intuitive cut-and-paste approaches, were suggested by a few invited survey speakers.
- (5) The results of the 8-year Japanese PIPS (Pattern Information Processing System) project were presented in the invited talk by Dr. H. Nishino (project leader), in the technical papers in the conference, and in the technical tour after the conference.
- (6) The cocktail reception, the luncheon party, and the banquet (featured by a Japanese traditional dancing and music), together with beautiful scenery near the conference hall, served to promote friendship among the participants.

All in all, the conference was very successful. I look forward to future IJCPR's as enjoyable and exciting as this.

Takeo Kanade

### NEW NEWSLETTER EDITOR

Beginning with the next issue, a new editor will take over the publication of the IAPR Newsletter. He is:

Dr. Martin Levine  
Electrical Engineering Department  
McGill University  
3480 University Street  
Montreal, Quebec H3A 2A7  
CANADA

Telephone: (514) 392-5413

The next issue of the Newsletter is scheduled to be published May 1, 1979. Closing date for news items is April 10. Please make sure that news items for the next issue reach the editor before this date.

## REPORT OF THE 4TH IJCPR

The 4th IJCPR was held at the Kyoto International Conference Hall in Kyoto, Japan, November 7-10, 1978. The number of participants totalled 543 from 24 countries in the world. The 167 overseas participants were divided among the following countries:

U.S.A. -- 58, France -- 28, Germany -- 17, Canada -- 9, The Netherlands -- 9, Italy -- 7, China -- 7, Sweden -- 5, England -- 5, and others. Japanese participants totalled 376.

Concerning the conference program, 211 out of 280 papers submitted in response to the 'Call for Papers' are included in the proceedings. Unfortunately, 2 invited surveys and 34 submitted papers were not presented at the conference. Outside of the opening session, 34 sessions were held in parallel in several different rooms of the same building.

One invited lecture in the opening session was entitled "PIPS Project--It's Background and Outline," and was presented by Dr. H. Nishino.

16 invited surveys were distributed among the technical sessions. The topics were well chosen and covered most areas in pattern recognition, giving historical backgrounds and recent trends.

At the luncheon on the final day, Prof. T. Sakai presented a talk entitled "Pattern Recognition and Society." As the social event, on the eve of the conference, a cocktail reception was held with nearly 250 participants gathering. 200 attended the banquet held during the middle of the conference and 430 participants enjoyed the conference luncheon.

After the conference on Saturday morning, the technical tour to Kyoto University was held with 72 participants and in the next week on Monday and Tuesday, 85 visited ETL and Post Office in Tokyo.

The conference was evaluated as a great success from many of the participants. The program, local arrangements, social events and supporting various arrangements were all planned well and ran very smoothly according to schedule.

On the evening of the final day of the conference, Professor Nagumo said that the great success was derived from 24 meetings of the Executive Committee and the great efforts of the Seven Samurai; the number of members of the 4th IJCPR Executive Committee.

I would like to express many thanks to the IAPR Executives, the 4th IJCPR Organizing Committees, all participants and related people for making the conference a great success.

As an end to my conference report, I would like to list the names of the members of the 4th IJCPR Executive Committee:

Vice Chairman: Prof. J. Nagumo  
Finance Chairman: Dr. H. Nishino  
Program Chairman: Prof. M. Nagao  
Local Publicity Chairman: Mr. Y. Tomaru  
Local Arrangements Chairman: Prof. K. Tanaka  
Secretary: Mr. S. Mori

Professor T. Sakai  
Chairman, 4th IJCPR Executive Committee

## NEW IAPR MEMBERSHIPS

**BELGIUM:** Pattern Recognition Contact Group of SEGOSCI; Category A membership, about 50 members.  
Representative: Dr. P. Devijver, MBL Research Lab, Ave E v. Becelaere 2, B1170 Bruxelles, Belgium

**CANADA:** Group Pattern Recognition and Image Processing of CIPS (Canadian Information Processing Society), Category A membership, about 45 members.  
Representative: Prof. M. D. Levine, McGill University, Department of Electrical Engineering, 3480 University Street, Montreal, PQ Canada H3A 2A7

**INDIVIDUAL MEMBERS:** Prof. Dr. Deekshatulu, Technical Division National Remote Sensing Agency, Balanagar, Hyderabad - 500 037 (A.P.), India

Dr. Celso de Renna e Souza, Instituto de Pesquisas Espaciais, Avenida dos Astronautas 1758, Caixa Postal 515, 12 200 S.J. Campos Sao Paulo, Brasil

## INTERNATIONAL SOCIETY OF PHOTOGRAMMETRY

The Working Group III-2 of the International Society of Photogrammetry decided that Dr. Leberl will establish a formal liaison with IAPR through his individual membership of IAPR. Below is his report on the International Society for Photogrammetry (ISP).

### General Information

ISP is a non-governmental international organization devoted to the development of international cooperation for the advancement and application of photogrammetry and remote sensing. It has presently about 60 national member societies. Congresses take place every 4 years, with the 14th one to be held in Hamburg, FRG, July 13-25, 1980. The first Congress was 1910 in Vienna Austria. The society is organized in 7 Commissions, each commission may operate a number of Working Groups.

Aspects of image processing are treated in all seven commissions. They are:

Commission I: Primary data acquisition (imaging

- devices, procedures, image quality
- Commission II. Instrumentation for data reduction
- Commission III. Mathematical analysis of data
- Commission IV. Topographic and cartographic applications
- Commission V. Non-topographic photogrammetry (industrial, medical etc.)
- Commission VI. Economic, professional and educational aspects
- Commission VII. Interpretation of data (photo-interpretation for geology, forestry, land use, soil mapping, urban planning etc.)

#### Working Group on Image Processing

Of particular interest to IAPR may be ISP-Commission III with its Working Group III-2 on Image Processing. This group held a symposium in Graz, Austria, October 3-5, 1977, under the title: "Image Processing - Interactions with Photogrammetry and Remote Sensing." The Proceedings (42 authors, 250 pages, Austrian Schillings 160.-) of this Symposium can be obtained from:

Dr. F. Leberl  
Institute for National Surveying  
and Photogrammetry  
Technical University  
Rechbauerstraße 12  
A-8010 Graz, Austria

Dr. Leberl and Dr. T. Keating (School of Civil Engineering, University of Maine, Orono, Maine 04473, USA) are co-chairmen of W.G. III-2.

Meetings of WG III-2 are planned in the context of the Annual Meeting of the American Society for Photogrammetry, March 18-23, 1979 in Washington, D.C. and in September 1979 in Stuttgart, FRG, in the context of the Photogrammetric Week at the University of Stuttgart. Those interested in the meetings should contact Dr. Leberl or Dr. Keating.

#### Other Related Working Groups of ISP

Working Group I/5 on "Data Acquisition and Image Processing in Remote Sensing"

Chairman: Dr. W. A. Fischer, 228 Noland Street, Falls Church, VA 22046 U.S.A.

Working Group II/4 on "Instruments for Processing and Analysis of Remote Sensor Data"

Chairman: Dr. J. V. Taranik, USGS-EROS Center, Sioux Falls, SD 57198 U.S.A.

Working Group IV/1 on "Digital Map Compilation and Cartographic Treatment of Digital Data"

Chairman: Mr. J. R. R. Gauthier, Topographical Survey, 615 Booth Street, Ottawa, Ontario, Canada K1A 0E9

Working Group IV/4 on "Mapping From Space-Borne Photography and Non-Metric Imaging Systems"

Chairman: Dr. A. P. Colvocoresses, USGS 522, Reston, VA 22092, U.S.A.

Working Group V/1 on "Analytics for Non-Topographic Photogrammetry"

Chairman: Dr. H. M. Karara, Department of Civil

Engineering, University of Illinois, Urbana, IL 61801, U.S.A.

Working Group V/3 on "Non-Conventional Imaging Systems for Non-Topographic Photogrammetry,"

Chairman: Dr. J. W. C. Gates, Division of Technical and Optical Metrology, National Physical Laboratory, Teddington, Middlesex, TW 11 0LW United Kingdom

Working Group VII/6 on "Interpretation Methods"

Chairman: Dr. A. Fontanel, Institute Francais du Petrole, F-92306 Rueil-Malmaison, France

#### The 1980 Congress of ISP

At the 1980-Congress in Hamburg image processing will be treated at several sessions of the various commissions. In addition, a separate inter-commission session on "Digital Image Processing" is planned. Those interested in presenting papers at this general session, or at the special WG III-2 session within Commission III, should contact Dr. Leberl or Dr. Keating. The deadline for submission of abstracts is February 1, 1980. The Congress Secretariate (ISP-Congress Hamburg CCH, P. O. Box 30 23 60, D-2000 Hamburg 36, FRG) should be contacted for more information on the Congress.

#### UPCOMING CONFERENCES OF INTEREST

##### 5th IJCPR

The Fifth International Joint Conference on Pattern Recognition will be held at Miami Beach, Florida, U.S.A. on December 1-4, 1980. The general chairman of the Conference is Professor Theodosios Pavlidis of Princeton University and the program chairman is Professor Y. T. Chien of the University of Connecticut. A 'Call for Papers' will be forthcoming. Those wishing more information should contact Professor T. Pavlidis at the following address (until July 1979):

Department of Electrical Engineering  
and Computer Science  
University of California  
Berkeley, CA 94720, U.S.A.

##### 16th Design Automation Conference

Date: June 25-27, 1979

For Information Contact: R. J. Smith, University of Texas, Department of Electrical Engineering, P. O. Box 1728, Austin, TX 78712 U.S.A.

##### Workshop on Computer Analysis of Time-Varying Imagery

Date: April 5-6, 1979

Location: Philadelphia, PA

For Information Contact: N. I. Badler, Computer and Information Science, Moore School of Electrical Engineering/D2, University of Pennsylvania, PA (215) 243-5862 or Dr. J. K. Aggarwal, Department of Electrical Engineering University of Texas, Austin, TX (512) 471-1369.

First International Symposium on Policy Analysis and Information Science  
Date: June 28-30, 1979  
Location: Duke University, Durham, NC U.S.A.  
For Information Contact: Prof. Paul P. Wang  
Department of Electrical Engineering, Duke University, Durham, NC U.S.A.

IEEE International Symposium on Information Theory  
Date: June 25-29, 1979  
Location: Grignano, Italy  
For Information Contact: Prof. Lee D. Davisson  
Department of Electrical Engineering, University of Maryland, College Park, MD 20742 U.S.A.

6th International Joint Conference on Artificial Intelligence (IJCAI)  
Date: August 20-24, 1979  
Location, Tokyo, Japan  
For Information Contact: Prof. Raj Reddy,  
Department of Computer Science, Carnegie-Mellon University, Pittsburgh, PA 15213 U.S.A.  
(412) 578-2597

7th Annual New England (northeast) Bioengineering Conference  
Date: March 22-23, 1979  
Location: Rensselaer Polytechnic Institute, Troy, New York U.S.A.  
For Information Contact: Lee E. Ostrander or Robert E. Dutton, Center for Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, New York U.S.A. (518) 270-6438

NCC'79 National Computer Conference  
Date June 4-7, 1979  
Location: New York City, New York U.S.A.  
For Information Contact: Merlin G. Smith, T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598 or Richard E. Merwin, Box 32222, Washington, D.C. 20007 U.S.A.

1979 International Conference on Pattern Recognition of Cell Images  
Date: May 21-23, 1979  
For Information Contact: 1979 International Conference on Pattern Recognition of Cell Images, International Academy of Cytology, 5841 South Maryland Avenue, HM #449, Chicago, Illinois U.S.A (312) 947-5343

AFCET/IRIA Reconnaissance Des Formes et Intelligence Artificielle  
Date: September 12-14, 1979  
Location: Toulouse, France  
For Information Contact: AFCET, 156 Boulevard Pereire, 75017, Paris, France

IEEE Computer Society Conference on Pattern Recognition and Image Processing  
Date: August 6-8, 1979  
Location: Chicago, Illinois  
For Information Contact: Prof. Robert M. Haralick, Virginia Polytechnic Institute and State University, Department of Electrical Engineering, Blacksburg, VA U.S.A.  
(703) 951-6646

The Sixth Conference on Computers in Radiology  
Date: June 18-20, 1979  
Location: Newport Beach, CA  
For Information Contact: Dr. James Lehr, Department of Radiology, Box 429, University of Chicago, Chicago, IL U.S.A.

Computer-Aided Analysis of Radiological Images  
Date: June 20-21, 1979  
Location: Newport Beach, CA U.S.A.  
For Information Contact: Dr. Jack Sklansky,  
School of Engineering, University of California, Irvine, CA U.S.A.

#### SWEDISH SOCIETY CONFERENCE FOR AUTOMATIC IMAGE PROCESSING

The first "Conference in Image Processing" arranged by the "Swedish Society for Automated Image Processing" was held October 17-18, 1978 in Stockholm. Contributions from 16 organizations across the country were grouped in five sessions:

- Systems for Image Processing (9 papers)
- Applications (10 papers)
- Perception (4 papers)
- Algorithms and Methods for Image Processing (12 papers)
- Remote Sensing (6 papers)

Thus 41 papers were presented - authored and/or co-authored by 43 persons, including a representative from the image processing bureau of the Swedish Board for Technical Development giving the paper: Image Processing as a part of information technics - some research policy aspects.

About 100 persons attended the two-day conference and participants as well as attendants came from Industry, Academy and Government groups. One contribution and some attendants came from Norway.

It was a consensus among the Society members present that the purpose of the conference - mustering of current image processing activities - had been well served and a consensus among nonmembers that one had not been aware of the wide range and high quality of the image processing activities already in progress in Sweden.

At a meeting of the Swedish Society for Automated Image Processing, October 17, 1978, the members decided to add a new member, S. Ingvar Akersten, to its Board of Directors, which now has seven members.

#### CURRENT BOOK PUBLICATIONS

L. F. Pau, Pattern Recognition and Signal Classification, Monograph, ENST, Paris, February 1978.

Proceedings of the 1978 NATO Advanced Study Institute on Pattern Recognition and Signal Processing (expected publication Dec. 1978); ed. by C. H. Chen.

Y. T. Chien, Interactive Pattern Recognition, Electrical Engineering and Electronics Series, Marcel Dekker, 1978.

Rafael C. Gonzalez and Michael G. Thomason, Syntactic Pattern Recognition: An Introduction, Addison-Wesley, 1978.

B. G. Batchelor (ed.) Pattern Recognition: Ideas in Practice, Plenum Press, 1978.

T. Pavlidis, Structural Pattern Recognition, Springer-Verlag, 1978.

R. Bernstein, ed., Digital Image Processing for Remote Sensing, IEEE Press (Selected Reprint Series), 1978

A. Rosenfeld, Picture Languages: Formal Models for Picture Recognition, Academic Press, 1979.

Peter W. Becker, Recognition of Patterns, Using the Frequencies of Occurrence of Binary Words, Springer-Verlag, 1978.

Cognition and Pattern (Iwanami Paperbacks, Yellow Series, No. 36) by Satoshi Watanabe (Professor Emeritus, University of Hawaii) January 1978.

#### ELECTION RESULTS

At its meeting in Kyoto during the 4th IJCP, the IAPR Governing Board elected the following officers:

- Chairman of Executive Committee - H. Freeman (USA)
- Vice-Chairman of Executive Committee - Satoshi Watanabe (USA)
- Secretary - C. J. D. M. Verhagen (The Netherlands)
- Treasurer - P. W. Becker (Denmark)

#### NATO ADVANCED STUDY INSTITUTE

Map Data Processing  
Maratea, Italy - June 18 - 29, 1979

A NATO Advanced Study Institute (ASI) on the subject of map data processing will be held in Maratea, Italy, June 18-29, 1979. The objective of the ASI is to further the dissemination of knowledge in computer cartography and those areas of computer graphics, image processing, pattern recognition, and software engineering that impact on map data processing

The ASI will consist of tutorial lectures and panel discussion sessions. Ample time will be provided for informal discussions among the participants. The lectures will cover both underlying principals and techniques as well as recent research results and applications. Major topics are:

- \* map data representation

- \* conversion of map data
- \* data structures for map data processing
- \* management of large map data bases
- \* algorithms for map data analysis
- \* software systems for map data processing
- \* applications involving geographic map data
- \* applications involving thematic map data
- \* applications involving biomedical map data

No registration fee is charged to accepted applicants. A limited number of NATO Grants are available for partial travel support. Persons interested in participating should at once contact either of the ASI co-directors:

Professor H. Freeman  
Computer Engineering Program  
Rensselaer Polytechnic Institute  
Troy, NY 12181  
U.S.A.

Professor G. G. Pieroni  
Departimento di Matematica  
Universita dell Calabria  
Toges di Rende, Cosenza 87030  
ITALY

#### TRANSPORTABLE IMAGE PROCESSING SOFTWARE

A transportable image processing software system is currently being designed. When completed, the system will facilitate the exchange of Fortran image-processing programs among many different machines. Input as to possible applications of such a system is invited from potential users. Please contact Professor R. G. Hamlet, Computer Science Department, University of Maryland, College Park, MD 20742 Telephone: (301) 454-4251, or Professor Azriel Rosenfeld, Computer Science Center, University of Maryland, College Park, Maryland 20742, Telephone: (301) 454-4526.

#### IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE

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#### Papers

A Hierarchical Syntactic Shape Analyzer -  
Theodosios Pavlidis and Farhat Ali

Decomposition of Two-Dimensional Shapes by Graph  
Theoretic Clustering -  
Linda G. Shapiro and Robert M. Haralick

A Description Method of Handprinted Chinese  
Characters -  
Takeshi Agui and Hiroshi Nagahashi

An Intrinsic Dimensionality Estimator from

Near Neighbor Information -  
Karl Pettis, Thomas Bailey, Anil K. Jain,  
Richard Dubes

An Optimal Frequency Domain Filter for Edge  
Detection in Digital Pictures -  
K. Sam Shanmugam and Fred M. Dickey

Organization and Access of Image Data by Areas -  
Allen Klinger and Michael L. Rhodes

Shape Matching Using Relaxation Techniques -  
Larry S. Davis

#### Correspondence

Hierarchical Representation of Waveforms -  
P. V. Sankar and Azriel Rosenfeld

Multivariate Autoregressive Feature Extraction and  
the Recognition of Multi-Channel Waveforms -  
Dag Tjøstheim and Ottar Sandvin

A Dynamic Programming Algorithm for the Distance  
Between Two Finite Areas -  
Roger K. Moore

Thinning Algorithms for Grayscale Pictures -  
Charles R. Dyer and Azriel Rosenfeld

Recursive Implementation of a Two-Step Non-  
parametric Decision Rule -  
Sargur N. Srihari

Construction of Natural-Language Sentence Acceptors  
by a Supervised Learning Technique -  
D. Coulon and D. Kayser

A Recursive Optimal Differential Method in Image  
Compression -  
Stephen H. Y. Hung

Matching Segments of Images -  
Keith Price and Raj Reddy

A Family of Similarity Measures Between Two  
Strings -  
Nicholas V. Findler

#### SPECIAL ISSUE FOR PATTERN RECOGNITION AND ARTIFICIAL INTELLIGENCE

April 1979 Table of Contents

#### Papers

Computer Tracking of Objects Moving in Space -  
J. W. Roach and J. K. Aggarwal

A Syntactic-Semantic Approach to Image Under-  
standing and Creation -  
G. Y. Tang and T. S. Huang

Operations on Images Using Quad Trees -  
G. M. Hunter and K. Steiglitz

Syntactic Decision Rules for Recognition of Spoken  
Words and Phrases Using a Stochastic Automation -  
R. L. Kashyap

N-Gram Statistics for Natural Language Understanding  
and Text Processing -  
C. Y. Suen

Problem-Solving Models and Search Strategies for  
Pattern Recognition -  
L. N. Kanal

Experiments in Text Recognition with the Modified  
Viterbi Algorithm -  
R. Shinghal and G. T. Toussaint

The Consistent Labeling Problem: Part I -  
R. M. Haralick and L. G. Shapiro

#### Correspondences

A Generalized Line and Junction Labeling Scheme  
with Applications to Scene Analysis -  
I. Chakravarty

On the Analysis of Accumulative Difference Pictures  
from Image Sequences of Real World Scenes -  
R. Jain and H. -H. Nagel

Design of a Special Interpreter for the Classifica-  
tion of Human Chromosomes -  
L. Vanderheydt, A. Oosterlinck and H. Van den  
Berghe

A Tree-to-Tree Distance and Its Application to  
Cluster Analysis  
S. Y. Lu

A. Cluster Separation Measure -  
D. L. Davies and D. W. Bouldin

Image Feature Extraction Using Diameter Limited  
Gradient Direction Histograms -  
J. Birk, R. Kelley, N. Chen and L. Wilson

#### CLOSING REMARKS FROM THE PAST CHAIRMAN

With the help from many of you, IAPR was finally  
established two years ago. The association is  
now in a very healthy situation and its member-  
ship is still increasing. The first issue of  
IAPR Newsletter was published in August 1978.  
The 4th IJCPR was a great success. Various new  
activities are being planned under the leadership  
of Herb Freeman and Mike Watanabe.

Again, Ms. Marilyn S. Hersh provided all the  
editorial assistance to this issue, and Mr.  
Harry Hayman was responsible for printing and  
distribution. We would like to thank both of  
them for their excellent job.

K. S. Fu