



International Association for Pattern Recognition, Inc.

An affiliate member of the International Federation for Information Processing

# NEWSLETTER

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## Editor

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## MESSAGE OF THE PRESIDENT OF IAPR, 1982

After the regrettable divorce from the AI community, which took place at the IJCAI conference of London in 1971, *Profs. K.S.Fu* and *A. Rosenfeld* started an IJ CPR conference. It was successfully held in Washington in 1973. A year later, *Profs. Verhagen* and *P. Becker* organized the Copenhagen ICPR, starting the alternation between the US and outside: Coronado in '76, Kyoto in '78, Miami in '80, Munich in '82.

A "standing group", headed by *Prof. Fu* was founded in '74 at Copenhagen, to promote and organize the ICPRs. It was at Coronado in '76 that the principles of IAPR were edicted under the impetus of *Profs. Fu, Freeman* and *Rosenfeld*. The official foundation of IAPR took place on 1/1/78, with the objective of the advancement of theory and practice in the field of PR, and more specifically to organize ICPRs, to publish periodicals, newsletters, and various works.

IAPR is a truly international organization, supported officially by 19 national groups of specialists of PR. At the recent meeting of the Governing Board in Munich, 5 new groups were admitted: Austria, India, Israel, Spain, Switzerland.

The recent ICPR held at Munich and organized by the West German group headed by *Prof. Marko* was a real success, as many of us have witnessed: 677 participants, excellent organization, a really wonderful welcome.

Thus it may be said that IAPR is now an adult and respected organization, thanks to *Prof. Fu*, and to the past presidents, *Prof. Freeman* and *Prof. Rosenfeld*.

The main objective of organizing ICPRs is fulfilled: '84 in Montreal, '86 in Paris are already decided. But the other objectives are either started or starting:

A Newsletter has been successfully started by *Prof. Levine*, and continued by *Prof. R. Bajcsy*. It has been decided to intensify its scope by nominating a correspondent for Europe: *Prof. E. Backer*, and a correspondent for Japan: *Prof. M. Nagao*. We wish that the IAPR Newsletter will be the medium used by our community to communicate all sorts of interesting information.

A Journal, the PR Letters, proper to IAPR, started by *Prof. E. Backer*. Anyone may submit a manuscript to this new journal. But we expect that the PR community will consider it as their journal "par excellence". Eric is waiting eagerly for your papers.

Technical Committees (TC), proposed by *Prof. Freeman* and approved at the meetings of IAPR instances at Munich. It should be recalled that IAPR is affiliated to IFIP, which delegates to us



all activities in the field of PR. We would thus like to establish these TC on the model of IFIP TCs. The next message will be devoted to these TCs. For the time being let us say that they aroused a lot of interest, and that they have made a good start.

Some other innovations should be noted:

- \* the introduction of young PR scientists, not elected by their national group, in some "ad hoc" committees. This shows the interest of the "founding fathers" in opening new opportunities for young and brilliant members of our community and to listen to what they may have to say;
- \* the creation of a committee "publicity and education". This title is, on purpose, somewhat provocative, and may sound like an offense to the dignity of a respectable community. May it recall only the very great necessity to make us known better in different fields. The present situation may be preoccupying: many fields such as CAD or robotics are rediscovering PR, not to speak, of course, of AI! We should make a special effort to be known outside. We need publicity! The best way is probably through educational activities, and many thought that to bring together the two trends might be fruitful.

As a wish for this new year 1983, may I say that I would like to see IAPR expand and innovate along the lines that the former presidents and governing boards have indicated and implemented successfully.

My best personal wishes for a HAPPY NEW YEAR 1983.

*J.C. Simon*

J.C. Simon  
President, IAPR

FROM THE EDITOR'S DESK

In this issue I give a report on the agenda and some important actions resulting from executive committee of IAPR and subsequently from the governing board of IAPR which took place on October 18 and 19, 1982 in Munich during the International Pattern Recognition Conference. These are not the minutes, just a report as perceived by R. Bajcsy.

*Professor Rosenfeld*, in the President's Report, summarized the activity of IAPR for the period of his presidency and expressed some of his concern for the scope of the IAPR. Actually, in this regard I wrote an editorial in Issue No. 2, August 1982, which was left unpublished for reasons known to the Computer Society office. Since most of the editorial was quoted from Prof. Rosenfeld's article and it expresses his concerns, I am inserting it here:

There is a need for continual communication between graphics and image processing at the research and development level. If they remain isolated from one another, a lot of reinvention is likely to take place.

Unfortunately, it has become increasingly difficult for anyone working with either technology to know everything that is going on in his own field, let alone keep up with the other one. Both have their own conferences and journals (Computer Graphics and Image Processing is the only journal explicitly devoted to both), and it has been found impractical to hold joint conferences.

There are several steps that should be taken in order to maintain at least minimal mutual awareness. Conferences on graphics should invite tutorial speakers to survey current developments in image processing from the standpoint of potential applicability to graphics and vice versa. Graphics journals and magazines should regularly publish editorials on relevant aspects of image processing, and vice versa. If communications between the fields can be maintained in this way, it should be possible to keep the reinventions to a reasonable number."

*Professor Danielsson*, the chairman of the membership committee reported on healthy expansion of our membership. Four new members have been elected: Switzerland, Spain, Austria and Israel.

*Professor Levine* presented the treasurer's report. It turns out that the largest expense is the publishing of the newsletter and it just shows its importance! We have a modest surplus and various proposals for spending it have been entertained but nothing has been resolved. *Professor Rutovitz* chairs an award committee made up of *Profs. Levialdi* and *Danielsson*, who are considering various award alternatives. Any suggestions should be directed to one of them.



Professor Becker reported on the new Journal: Pattern Recognition Letters, which aims for quick short publications of new results. He also has prepared a new brochure to advertise our activities. All the representatives of individual countries received a copy of the first draft of this brochure in order to comment on it so that in 1983 we can publish it. Discussion was also on the subject of the newsletter and how to improve it. It has been suggested that we should solicit from the members of the IAPR letters to the editor and other news from individual countries so that the newsletter serves at its best. In order to increase the information flow about the activities in different countries there are going to be in addition to R. Bajcsy, two correspondent editors: Prof. Becker for the European community and Prof. N. Nagao for Japan.

Professor Freeman reported on three subjects: One is our affiliation with IFIP, the second a proposal for establishing technical committees (see the list below), and finally, on the amendments to the Constitution or Bylaws of IAPR. From his report on IFIP we learned that IFIP's next congress will be in Paris, France on 19-23 September 1983. Deadline for submission of papers was November 1 1982! IFIP is interested in strengthening its relationship with IAPR and encouraging IAPR to expand its activities through the formation of technical committees, the organization of workshops, etc. It has invited IAPR to send delegates to any of the IFIP technical committees in which there appears the possibility of mutually beneficial interaction. Possible candidate committees are "Education (TC3), Computer Applications in Industry (TC5), System Modeling and Optimization (TC7), and Relationship between Computers and Society (C9).

The amendments I will skip since they are long and tedious. However, if anyone is interested I will be happy to forward them directly.

#### LIST OF PROPOSED TECHNICAL COMMITTEES

- 1) Statistical Pattern Recognition Techniques
- 2) Syntactical Pattern Recognition Techniques
- 3) Image Preprocessing Techniques
- 4) Image Understanding Techniques
- 5) Software Systems and Languages
- 6) Special-Purpose Architectures
- 7) Applications in Remote Sensing
- 8) Applications in Industry
- 9) Applications in Bioengineering and Medicine
- 10) Applications in Map Data Processing

The culmination of the IAPR activities is the International Conference on Pattern Recognition held biannually. Professor Marko reported on the ongoing activities in Munich. I do not have a formal report at hand but it has been observed that the attendance was around 800. The largest delegation was from Japan. My own perception was that the meeting was superbly organized with quality and grace. I would have wished to see more students, however. The chairman of the Conference Committee, Professor Pavlidis reported on the next conference, which will be in Montreal in 1984 and the following in Paris in 1986.

Finally, the new president and the executive committee were elected:

#### EXECUTIVE COMMITTEE

President	J.C. Simon	France
1st Vice		
President	T. Kohonen	Finland
2nd Vice		
President	M. Nagao	Japan
Past Pres.	A. Rosenfeld	USA
Treasurer	H. Freeman	USA
Secretary	P.A. Devivjer	Belgium
Past Conf.		
Chairman	H. Marko	R.F.G.
Next Conf.		
Chairman	M.D. Levine	Canada

On October 20, 1982, the newly elected executive board met and the new standing committees were established:

#### STANDING COMMITTEES

##### Nomination

Chairman	A. Rosenfeld
Members	P. Becker, S. Leviardi, D. Majumdar, M. Takagi

##### Conference

Chairman	H. Marko
Members	T. Chang, J.P. Haton, N. Nagumo, T. Pavlidis

##### Membership

Chairman	P.-E. Danielsson
Members	P. Devivjer, H. Kazmierczak, F. Leberl

##### IAPR Newsletter

Editor	R. Bajcsy
Correspondants- for Europe:	E. Backer
for Japan:	M. Nagao



There is one new committee: PUBLICITY AND EDUCATION. There had been a long discussion on its name and function. In order to clarify the issue I quote the new president's letter of appointment to this committee which explains its purpose:

"The title of your Committee may sound somewhat provocative, mixing up the noble cause of Education with the more disputable aspect of Publicity.

In fact, IAPR needs to be much better known. We must realize that many new vigorously expanding fields, such as CAD, Robotics and AI are rediscovering Pattern Recognition.

Many industries looking for applications do not know of our existence. Thus, I ask you to propose whatever measures you believe to be appropriate to improve this situation.

Isn't it publicity?

On the other hand, education is one of the means to be better known. Some members of your Committee are especially interested in the educational field.

Instead of creating two committees, we thought it would be better for the time being to consider both aspects at the same time."

Excerpts From  
INFORMATICS AND EDUCATION: IFIP'S NEW INITIATIVES  
(This report has been written for IFIP by Kenneth Owen, former Technology Editor of the Times, London)

New technology brings new problems for society: it is easy to agree with this statement of the obvious. Doing something about the problems is rather more difficult. And, of course, new technology always has brought new problems for society; the only difference now is that the pace of technological change is accelerating so rapidly that it is straining our ability to cope with the new realities.

Hence the proliferation of conferences, newspaper and magazine articles and radio and television programmes on the various impacts of technological change on society. Many of these discussions have concluded that the long-term solution to the problems will depend on education. Again it is easy to agree with this worthy generalization--again it is another matter actually to agree and implement what needs to be done.

In broad terms, the overall problem appears virtually insoluble: how to reconcile the rapid advance of an all-pervasive information technology with the traditionally slow-moving world of education. Such is the momentum of existing systems of education that any change of direction is difficult to achieve; how can education ever catch up with the real world? And there are two separate elements to the basic problem: how to educate those who will be the practitioners of informatics, and how to apply informatics in education in general. In other words there is education for computing, and there is computing for education.

There is also the international dimension. Though national systems of education will differ from each other in detail, the overall problem they are all facing is the same. Microprocessor, database concepts and computer-aided techniques do not change as they cross national boundaries. In seeking national solutions there may well be benefits in drawing on international experience. ----- In April 1983 a working conference on informatics in elementary education is planned; this will take place in Kiel, West Germany. As the impact of the microcomputer not only spreads across the whole secondary sector but also moves down into the primary schools, new concepts will emerge and new problems will have to be solved. ----- University level. After lying dormant for some time, the second of TC\* 3's working groups, WG\*\* 3.2, has recently been revived in order to help education to respond to a number of major changes in computer usage. Its chairman is Professor William Atchison of the University of Maryland, USA. ----- Technology has advanced; the use of computers has changed drastically in at least four ways:

1. More (and smaller) companies can afford computers for management.
2. More (and smaller) companies can afford the industrial use of computers (for example, computer-aided design, production management, robotics and office automation).
3. Digital data transfer permits access to new services on a worldwide basis (for example, teletex, electronic mail and databases).
4. The ubiquitous microprocessor is invading the whole of industry from toys to avionics.

This raises a number of problems. One is that the curriculum for specialists in computer science will have to be changed.

The second problem is much bigger. How should all students be trained in the use of the available computer-based tools such as CAD, CAM

\* Technical Committee

\*\* Working Group

TC 3 is IFIP's technical committee concerned with education.



and the use of databases?

Moreover, the existence of computer-based tools is already changing the very content of most professions...medicine, architecture and engineering, for example. Most of these people will not write programs. They will be users of turnkey systems. How, then, should the content of all curricula (outside computer science) be changed to prepare students for these modified professional activities?

----- At present the (working) group's main activity is focused on the organization of a working conference on "Computer science for all students at university", which is to be held in the Netherlands in the summer of 1983.

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Vocational training. The third of the TC 3 working groups to have its scope tailored to a specific sector of education is WG 3.4, which is concerned with vocational education and training. The formal title of this group previously included the phrase "post-secondary"; this has now been deleted in order to accommodate also vocational education at the secondary level. Chairman of WG 3.4 is Patrick Raymont, of the National Computing Centre, Manchester, England.

----- Forthcoming events for WG 3.4 include a working conference in Austria in 1983 which will discuss education for cooperative (system designer/use) approaches to system design. At this meeting five case studies will be presented by the system designer or user (or both), analysed by theoreticians and openly discussed.

----- The fact that computers are being used more and more in practically every vocation is the background theme to a wider-scope working conference which is being planned for 1984 in Jerusalem, Israel.

----- Some subjects, as indicated earlier, cut across the formal boundaries between the various technical committees, leading to joint events. Thus in collaboration with TC 9, whose scope is the relationship between computers and society, TC 3 is mounting a joint working conference on "Evidence of social change caused by computers in education". This will be held in Toronto in 1984.

The aim of this conference is to examine the effects, both positive and negative, that have been observed in society as a result of the use of computers in the educational system. The significance of the year 1984 is not lost on the organizers. Mr. R.S. McLean, the Canadian representative on TC 3 and chairman of the programme committee, says: "The year 1984 is a fitting time to focus attention on this issue, and to confirm or lay to rest the 'Big Brother' idea in educational computing, and to focus on the positive aspects we have control over".

## CALL FOR PAPERS

Fifth National Conference  
 Cognitive Science Society  
 18-20 May 1983

The next National Cognitive Science Society meeting will be held at the University of Rochester in the third week of May 1983, just before the Rochester Lilac Festival.

It will consist of invited lectures, panels, commentaries and submitted papers.

Authors are invited to submit papers for consideration for presentation at the meeting.

Papers may:

report current work in a research field relevant to the understanding of cognition;

point out or elucidate an interdisciplinary link between fields; address a point of current controversy or discussion within Cognitive Science.

Submitted papers will be reviewed by a refereeing panel appointed by the Society. Accepted papers will be published in the Proceedings. Three copies of submissions must be received by 15 February 1983. Authors will be notified of acceptance after 15 March 1983. Camera-ready copy due 15 April 1983. (Papers must be of such a length as to fit completely into four 8-1/2" x 11" pages when camera-ready.)

Send papers and queries to:

Cognitive Science Conference  
 University of Rochester  
 Dewey Hall  
 Rochester, New York 14627  
 (716) 275-5402

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### Second Call for Papers

Third Scandinavian Conference on Image Analysis  
 Copenhagen, Denmark  
 July 12, 13, 14, 1983

#### CONFERENCE STEERING COMMITTEE

P. Becker, (Denmark), Chairman  
 P.E. Danielsson (Sweden)  
 E. Granum (Denmark)  
 P. Johansen (Denmark)  
 T. Kohonen (Finland)  
 T. Orhaug (Sweden)

#### TECHNICAL PROGRAM COMMITTEE

P. Johansen (Denmark), Chairman  
 G. Granlund (Sweden)



The Conference:

The Danish Pattern Recognition Society hosts the Third Scandinavian Conference on Image Analysis. This is an international conference open to contributors and participants from all countries. The official language will be English. The conference is sponsored by the International Association for Pattern Recognition.

Topics of Interest:

The Conference is open to all aspects of Image Analysis, including

- theoretical problems in IA
- remote sensing
- software
- hardware
- industrial applications
- biotechnical and biomedical appl.

Sessions on other topics of Pattern Recognition may also be organized, depending on the abstracts received. The duration of the presentations will be 20 minutes. During the conference, several invited speakers will give talks on selected topics of Image Analysis and Pattern Recognition.

Paper Submission:

The deadlines will be:

- December 15, 1982 - Abstracts due
- February 15, 1983 - Acceptance letters and authors' kits mailed
- April 15, 1983 - Manuscripts due

All accepted papers will be published in the Conference Proceedings, which will be available at the time of the Conference.

## INVITED SPEAKERS

The invited speakers are:

- H. Freeman, Rensselaer Polytech., U.S.A.  
 K.S. Fu, Purdue University, U.S.A.  
 M.D. Levine, McGill University, Canada  
 L.F. Pau, ENST, France  
 A. Rosenfeld, Univ. of Maryland, U.S.A.  
 D. Rutovitz, Medical Research Council, U.K.

## CONFERENCE LOCATION

The Conference will take place at Hotel Eremitage in Lyngby. Hotel Eremitage is located near the Technical University of Denmark. Downtown Copenhagen can be reached in half an hour by train.

## REGISTRATION INFORMATION

Registration fee will be D.kr. 1.800,- before May 15 and D.kr. 1.900,- thereafter. The registration fee includes two (2) copies of the conference proceedings (boxed for mailing).

The registration desk is open at the Hotel Eremitage on Monday, July 11, from 6 pm to 8 pm and at the conference location on Tuesday, July 12, from 8 am.

## Registration and Payment

For registration forms, contact

Spadille Congress Service  
 Sommervej 3  
 DK - 3100 Hornbaek  
 Denmark  
 Phone: 45 2 202496

The registration form must be accompanied by a check payable to Spadille Congress Service covering the grand total. Personal checks drawn on non-Danish banks will not be accepted. Although payment by check is preferred, it would be acceptable if the grand total is paid by direct bank transfer to Privatbanken, Hornbaek 2260, Account No. 421549, DK-3100 Hornbaek, Denmark. Checks and payment orders should be made out in Danish Kroner. Please clearly mark all remittances with the words "TSCIA 83". Names or addresses on checks should be typed or written in block letters.

In case of payment by bank transfer, please bring the original receipt of your payment when you register. This is in your own interest in case there should be some irregularity in mail or bank operations. Please note that at the registration desk all payments must be effected in Danish currency. Personal checks and credit cards cannot be accepted at the registration desk.  
 Hotel Reservations and Accommodations

The grand total must include the deposit. The deposit will be deducted at the time when the bill is finally settled with the hotel. Allocation of hotel rooms will be effectuated in the order in which registration forms with payment of deposit are received. In the event that the desired hotel is fully booked it is attempted to arrange for accommodation in another hotel of the same category. For registrations received after May 15, 1983, hotel rooms cannot be guaranteed. Therefore, please register at your earliest convenience. Hotel reservations are binding and no refund of deposit can be made for cancellation received after May 15, 1983.

## SOCIAL EVENTS

Those arriving on Monday, July 11, are invited to a Get-Together-Party in connection with early registration at the Hotel Eremitage.



A conference banquet will take place on Wednesday evening, July 13, at Hotel Eremitage. If you wish to buy tickets for the banquet, please indicate that on the registration form and add D.kr. 100.- per person to your early registration dues. Banquet tickets will also be available at the registration desk. For spouses, a limited companions' program may be organized.

#### PROCEEDINGS

Additional copies of the conference proceedings will be on sale at the time of the conference.

#### LUNCHES

Refreshments at session breaks and lunch July 12, 13 and 14 are included in the registration fee. The lunches will be served at Hotel Eremitage.

### CONFERENCES

#### AF CET CONGRESS 1983

PRODUCTOLOGY AND INTELLIGENT ROBOTICS  
Besancon (France) - November 15-17

The ever-increasing global approach demanded by automation can be summarized in the three title words of this congress:

PRODUCTOLOGY - ROBOTICS - INTELLIGENCE.

**PRODUCTOLOGY** - to insist on the fact that automation is no longer simply a relationship between actuators, machines or workshops, but allied to the act of production itself, which at the right moment, in the quality desired, and in the quantity necessary, must supply a group of products.

**ROBOTICS** - for the robot is the first truly flexible and programmable machine which makes it possible to interconnect the discontinuous operations characteristic of manufacturing production in a continuous manner.

**INTELLIGENCE** - because the efficiency of an integrated production system is obtained by a large "delegation of power" to the different sub-systems which then must possess a true functioning autonomy.

This congress is built around a core of eight themes which constitute the projections to be used in analyzing productology.

The key words give an idea of the extent of the competences needed today to encompass all the facets of automation.

Two technical themes are handled in greater detail: WELDING and ASSEMBLY, for these professions in particular are going to undergo transformations with the arrival of this intelligent use of robots.

It is our sincere hope that this congress will attract conferences of quality. In this manner, it will constitute an up-to-date

methodological reference in this field by giving us an important direction for the 90s.

The delegates of the European Community are invited to profit from the central location of the city of Besancon, which welcomes them to come and present their work.

During the congress, a hall for the projection and presentation of experiments on posters will be placed at the disposal of all interested persons.

#### Themes of the Sessions

**METHODOLOGIES** - mathematical tools, algorithms for workshop guidance, scheduling, analytical methods, engineering methods, operational safety, decision assistance, artificial intelligence

**TRANSPORT SYSTEMS** - handling, conveyors, autonomous vehicles, guidance systems, mobile robots, palletization, pre-packing (intermediate, final), packaging, shipping

**HUMAN ASPECTS** - training (instruction programmes), qualification, ergonomics, work valorization, work safety, man-machine dialogue

**ECONOMIC ASPECTS** - investments, amortization, profitability, reproductivity, calculations, strategy of the equipment industries, technico-commercial dependencies.

**SOCIAL ASPECTS** - employment, introduction within the company, mutation of competences, regional balances, work structure and organization

**TECHNOLOGICAL TOOLS** - industrial data processing (languages, system experts), networks, information systems, sensors, instrumentation (sight, touch), actuators, electric motors, digitalized axes

**WELDING** - robots, welding machines, joint tracking sensors, lasers, CAD

**ASSEMBLY** - methodology, robots, sensors, fastening techniques, form recognition, clamps, effectors, peripheral robots, conditioning, CAD

#### SUBMISSION OF PAPERS

Potential authors are invited to send a summary of the papers they wish to propose to the Congress Secretariat before November 1, 1982

#### Deadlines

November 1, 1982	abstracts submission
November 20, 1982	authors notification (abstracts)
March 1, 1983	full texts submissions
June 10, 1983	authors notification (full texts)
July 31, 1983	final texts sent

#### Secretariat of the Congress

A.F.C.E.T.  
156, Bld Pereire  
F. 75017 Paris  
(1) 766 24 19  
Telex: 290 163 EURTEL Code 235



## RECENT CONFERENCES

The 3rd IFAC Symposium on "Control of Distributed Parameter Systems" was held in Toulouse (ENSAE) - June 29-July 2, 1982.

Over 110 participants representing countries from Eastern and Western Europe, North America, South America, Japan, China and the Soviet Union, attended the meeting.

Topics presented included both the mathematical theory and applications of theory and concept to particular areas of science and engineering. Partial differential equations and delay differential equations were the primary mathematical systems discussed. Mathematical topics in optimal control and design, stabilization, identification and estimation of parameters, and stochastic control were presented. Applied sessions included presentations on large flexible space structures and control of thermal and energy systems.

Proceedings available - year 1983 - from

PERGAMON PRESS, Ltd.  
Headington Hill Hall  
Oxford OX3 0BW

For further information:

Jean Pierre Babary  
LAAS  
7, av. Colonel Roche  
31400 Toulouse (France)  
phone: (61) 25 21 47

IFAC Symposium  
"Components and Instruments for  
Distributed Control Systems"  
Paris  
December 9-11, 1982

The Symposium offered a unique meeting ground for joint action and cooperation between the various specialists (automaticians, data processors, electronic and process engineers. The topics dealt with were:

- integrated components, sensors, micro-processors, display devices and communication systems;
- intelligent instruments, measuring instruments, analysers, controllers and regulators;
- actuators, conveyors, manipulators and robots and the design, architecture, organization and synthesis of distributed control systems, their methods and their applications.

The International Exhibition MESUCORA took place in Paris at the same time.

A detailed programme can be obtained on request from the Congress Secretariat:

A.F.C.E.T.  
156, Bld Pereire  
F. 75017 Paris  
(1) 766 24 19  
telex: 290 163 EURTEL Code 235

## SPECIALIST WORKSHOP

PATTERN RECOGNITION IN PHOTOGRAMMETRY  
26-28 September 1983  
GRAZER CONGRESS, Schmiedgasse 2. A-8010  
Graz, Austria

## MAIN TOPICS

RECONSTRUCTION OF  $n$ -D OBJECT SHAPE  
parallax detection, shape from shading, determination of sensor orientation, image transformation (rectification, etc.), aircraft and satellite images, radar, medical and industrial images, etc.

## KNOWLEDGE-BASED IMAGE ANALYSIS AND IMAGE UNDERSTANDING

knowledge models and digital maps, image-based information systems, map-guided image analysis, computer-assisted photo-interpretation, use of terrain data and of image simulation, etc.

## DATA STRUCTURES AND CONVERSIONS

line following, vectorization in scanned cartographic images, editing of vectorized data, effect of data structures, data compression.

## MISCELLANEOUS OTHER TOPICS

## ORGANIZED BY

Working Group III/5 of the International Society for Photogrammetry and remote Sensing and Austrian Working Group on Pattern Recognition in conjunction with  
Graz Research Center  
Technical University Graz  
Austrian Computer Society.

For more information and for submission of extended abstracts (2 pages) contact:

Dr. F. Leberl, Techn. Univ. Graz, Wastiangasse 6,  
A-8010, Graz; tel.: (0316) 82 5 31-0  
telex: 31 265

Dr. M. Faintich, DMA-Aerospace Center, St. Louis  
Air Force Stat. Missouri 63118,  
USA

Abstracts of proposed papers due by April 30, 1983



## PH.D THESIS ABSTRACT

QUANTIFICATION AND CHARACTERIZATION OF THE MOTION  
AND SHAPE OF A MOVING CELL  
McGill University, Canada  
June 1982

supervisor: M.D. Levine  
author: Youssry M. Youssef

The main function of a blood cell's surface is to receive information from the environment. Recently, experiments have indicated that the cell membrane plays a vital role in the life, development, and regulation of cells. However, there is no existing method to quantify the observable changes in membrane shape that occur in locomotion. To achieve this objective using automatic techniques of digital image processing, the main goal of this research is to develop an image interpretation system capable of analyzing the structural changes in the morphology of a non-rigid moving object from a sequence of pictures.

A model for a general dynamic scene analysis system is described. It consists of three basic entities: dynamic data, static data, and a collection of analysis processes. Based on this model, we have implemented a rule-based image interpretation system for moving cells.

The system describes the dynamic behaviour of a moving cell using symbolic terminology which is meaningful to individuals working in cell biology. With the aid of this system, the global changes in the cell structure and pseudopod kinetics are analyzed. Hence, a subpart of the cell is classified as being either "pseudopod" or "cell body". A pseudopod is described as "growing", "contracting", or "stationary". Furthermore, other aspects of the global behaviour of the cell are characterized and described. For example, the "domination" of a pseudopod in contributing to the locomotion of the cell.

The system is also applicable to the study of the dynamics of other white blood cell types. Ultimately, this type of study could allow the detection of abnormalities, and the effects of drugs, if any, in the locomotory responses of leucocytes.

## NEW TITLES

TITLE: COMPUTER ANALYSIS AND PERCEPTION  
Volume I, *Visual Signals*

EDITORS: Ching Y. Suen, Ph.D.  
Professor and Chairman  
Department of Computer Science  
Concordia University  
Montreal, Canada

Renato De Mori, D. Eng.  
Professor of Computer Science  
University of Torino  
Torino, Italy

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Outside U.S.: \$66.00 Prepub.

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TITLE: COMPUTER ANALYSIS AND PERCEPTION  
Volume II, *Auditory Signals*

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